

The Effect of Rumination on Social Problem-solving and
Autobiographical Memory Retrieval in Depression:
A Cross-cultural Perspective

Ph. D. Thesis

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ABSTRACT

Previous research has indicated that depression and thinking style (rumination versus distraction) interact to influence cognitive processing. Depressed ruminators produce more categoric autobiographical memories (AM) (i.e., a summary of repeated memories), and also demonstrate poorer SPS performance than depressed distracters and matched controls. The quality of AM retrieval during SPS is also related to the effectiveness of SPS solutions such that categoric AM retrieval during SPS contributes to poorer SPS. Therefore, the first aim of this thesis was to extend previous work by further investigating how an induced rumination/distraction influences subsequent AM retrieval during SPS and SPS performance. The first two studies examined how thinking style influences SPS and AM retrieval during SPS in a dysphoric (study 1) versus clinically depressed sample (study 2). The results indicated that rumination has a detrimental effect on SPS in both dysphoric and clinically depressed samples, with more pronounced effects in the clinical group. Rumination also appeared to influence Am retrieval during SPS for the clinically depressed group but not the dysphoric group. Moreover, in both samples, SPS performance was associated with the type of AM retrieval involved in the SPS process. As most studies investigating cognitive processes in depression have focused on Western people, a second aim of this thesis was to examine the association between thinking style, AM

retrieval and SPS performance in depression from a cross-cultural perspective. The first cross-cultural study (Study 3) looked at AM retrieval on the AMT cueing task and the second cross-cultural study (Study 4) investigated whether these associations between thinking style, SPS and AM retrieval would vary across different cultures. Culture interacted with depression to influence AM retrieval on the AMT cueing task. However study 4 demonstrated that there seemed to be no interaction between culture, rumination and depression on SPS performance and AM retrieval during SPS.

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CHAPTER 1

INTRODUCTION

1.1 General Introduction on Depression

1.1.1 Definition of Depression

Depression itself has received considerable attention from both theoretical investigation and clinical practice (Gilbert, 2006; Reeder, 2003). The most representative features of depression consist of mood disturbance, cognitive dysfunction, physical discomfort, sadness, feeling of worthlessness, feelings of guilt, difficulty in making decisions, poor concentration, loss of energy, sleep disturbance, and loss of social interest (Davidson & Neale, 2001; APA, 1994). An occasional low mood can occur to everyone. However, the most extreme form of depression can lead to the complete disruption of social and daily functioning. Depression is also associated with suicidal ideation and suicide is a negative outcome associated with depression.

Depressive symptoms can be co-morbid with many other mental disorders such as anxiety disorder, brain damage, mania, schizophrenia and dementia (APA, 1994). As Prisciandaro and Roberts (2005) have demonstrated in their study, depression is a dimensional interpretation rather than a categorical phenomenon (i.e., existing on a continuum that varies in severity with normal human experience). However, the mechanism of depression may be different depending on whether depression is the primary or secondary diagnosis.

1.1.2 Cognitive Theories in Depression and the Explanation of Deficits in Depression

Depression has been widely studied from different theoretical frameworks such as biology, psychoanalysis, cognitive and behavioural theory. Each framework has its unique assumptions and explanations as to how the disorder is occurring and the development of intervention strategies specific to the particular mental disorder. This thesis will examine cognitive biases associated with depression. Therefore, the cognitive theories will be reviewed.

1.1.2.1 Beck's Schema Theory (Beck, Rush, Shaw, & Emery, 1979)

One of the most notable frameworks to explore depression is Beck's schema theory. Beck (1967, 1976, 1979, 1987) proposed that depression is associated with dysfunctional schemata. According to Beck (1979), schemata are cognitive structures that shape an individual's perceptions, interpretations and memories. The schemata are characterized as a set of attitudes, beliefs, thoughts and expectations. The core schemata associated with depression consist of negative evaluations of the self, the world and the future. Through the interaction between the negative cognition and the outer world, a biased schema is then strengthened and can lead to mood disturbance.

Beck's schema theory is one of the first and the most important in explaining depression. It makes a real contribution in the treatment of the emotional disorders

by suggesting some of the cognitive processes involved in the disorder. However, a clear definition of the meaning of schema is not presented in Beck's theory. Moreover, the explicit cognitive processes involved in schematic processing have not been discussed although there is some reference to automatic processing. Beck et al. has proposed that depression is characterized by faulty information processing errors, namely: arbitrary inference, selective abstraction, overgeneralization and polarized thinking, and that these processing errors operate automatically. However, Beck does not elaborate on how the basic cognitive processes involved in schematic processing, such as selective attention, encoding, and retrieval, operate (Williams, Watts, MacLeod, & Mathews, 1997, pp. 10-11).

1.1.2.2 Williams, Watts, MacLeod, and Mathews's Modelling Dissociations (1988, 1997)

Williams et al. (1988, 1997) have focused on how cognitive biases are specific to specific emotional disorders. The theoretical base for their model comes from Graf and Mandler's (1984) distinction between priming (integration) and elaboration of stimulus. Integration refers to automatic processing occurring at an early stage in information processing. During integration there is activation of multiple elements involved in the representation of a particular stimulus. In this stage the internal representation of this information is strengthened by this process and becomes more accessible. Elaboration, in contrast, refers to a later stage that is more resource-demanding and strategic. In this process, a new pathway is generated between the incoming information and related information that is already represented in memory. Therefore, new associative pathways are

generated and also the old pathways are strengthened through spreading activation between existing associations. The elaborated materials become more retrievable as they have greater associated links for that mental representation. Williams et al. argued that these two distinct processes are associated with different forms of mental disturbances. More precisely speaking, specific emotional disorders are characterized by greater disruption in particular cognitive processes. It has been assumed that anxiety is characterized by disruption at the integration stage; it is associated with increasing sensitivity to threatening information at an early perceptual stage of processing. In contrast, for depressed individuals, processing the depressive-relevant information involves creating mental representations that involve elaborating the link between existing information in personal memory and the information in the newly happening event. This elaboration process renders the negative mental representation more retrievable. This model provides a good explanation for mood congruent memory, which is defined as the tendency to retrieve information that is consistent with one's current mood (Watkins, Mathews, Williamson, & Fuller, 1992). However, there is evidence that is inconsistent with the predictions of this theory. For example, Watkins (2002) as well as Watkins, Vache, Verney, Muller, and Mathews (1996) and have demonstrated a depression-related implicit memory bias that may result from semantic priming occurring at the integrative stage. In addition explicit memory biases for threat-relevant information have been found in some of the anxiety disorders such as panic disorder (Coles & Heimberg, 2002) and generalized anxiety disorder (Friedman, Thayer, & Borkovec, 2000). Furthermore, this model has difficulties accounting for how two different cognitions: hot cognition (i.e., a cognition where emotion is processed) and cold cognition (i.e., a cognition where emotion is not

processed) operate. The model of Williams et al. (1997) is a single level model and does not take into account the complex interaction between multiple processing subsystems. Williams et al. have suggested that a multiple level of representation model would explain better the complex interaction between cognition and emotion. In the following section, an introduction of the ICS model will be presented to outline the advantage of a multilevel framework for representing the emotional disorders.

1.1.2.3 The Interactive Cognitive Subsystems Framework (ICS; Teasdale & Barnard, 1993)

ICS is a multi-level framework that was designed to model the mental activity in respect of cognition by the interaction of nine distinct subsystems (Teasdale & Barnard, 1993). Each subsystem has its own code and coding system, working under a number of operating principles. Some of the subsystems are related to the sensory aspect of the experience, whereas others are involved in a further level of representation of the experience such as the meaning and implications. The information processing involves the activation and transformation of the patterns of information in one code to the pattern of information in another code (see Teasdale, 1999, pp. S61). Cognitive processing mainly results from the interaction of these subsystems working interdependently.

According to ICS, there are two subsystems, which represent higher order meaning: the Propositional code and the Implicational code. These two subsystems are regarded as essential in most of the mental activities. They are

particularly responsible for the production of emotional experience and the further modification of it. The relationship of these two levels of subsystems mirrors the relationship between “letter of a sentence” and “meanings of a sentence” (cf. Teasdale, 1999). Only the basic semantic elements of the specific meaning is involved in the Propositional code. Information in this level is explicit and easy to understand. In contrast, Implicational code represents higher level of meanings, which are implicit, and a schematic model responsible for synthesizing. This is the level in which emotion is generated. The propositional meaning and implicational meaning are functioning reciprocally. For example, the propositional subsystem provides specific information (sometimes in combination with sensory input) to the implicational subsystem; the implicational subsystem offers contextual information to the propositional subsystem through the transformation of patterns.

ICS offers some explanation for the impaired cognitive style in depression in terms of the depressive interlock. It is argued that depression is a consequence of the elaborated iterative cycles between the propositional subsystem and the implicational subsystem. In other words, the depressogenic schematic model was strengthened in the implicational subsystem receiving the feedback loop from the propositional subsystem. The active schematic model generates negative propositions such as “I am a failure” which in turn reinforce the schematic model from the feedback of implicational subsystem. This conceptualization is similar to Williams et al. in that the depression-related materials are highly elaborated in both the encoding and retrieving process. Hence, the depressogenic schematic model is strengthened and becomes dominant, which renders the depressed-related materials more accessible.

The ICS model provides an explanation for the complex interaction between cognition and emotion. Furthermore, it offers a conceptualization to distinguish the “hot cognition” and “cold cognition”, occurring in the implicational subsystem and the propositional subsystem respectively.

1.2 Cognitive Deficits Associated with Depression

It is well known that there are cognitive impairments in depression such as poor concentration, difficulties in making decisions and lack of motivation. In earlier years, research identified only a few cognitive impairments associated with depression (Miller, 1975). Most of the research looking at the cognitive impairment in depression focused mainly on speed of processing, memory, attention, and central executive functioning. More recent research has indicated that the cognitive impairments are more diffuse. In this section, a general review of these topics will be given, following by a more specific introduction to a recently identified bias, that of AM retrieval bias in depression.

1.2.1 General Cognitive Impairments in Depression

Most of the research looking at the association between psychomotor speed and depression found that depressed people showed significantly slower psychomotor reaction to cognitive tasks such as the simple reaction time (SRT) task (Austin, Mitchell, Wilhelm, Parker, Hickie, Brodaty, Chan, Eyers, Milic, & Hadzi-Pavlovic, 1999; Moffoot, O’Carroll, Bennie, Carroll, Dick, Ebmeier, &

Goodwin, 1994) or choice reaction time performance (Tarbuck & Paykel, 1995). They also showed slower performance on the digit symbol substitution task from the revised Wechsler Adult Intelligence Scale (WAIS-R; Wechsler, 1981) (Ridout, Astell, Glen, Reid, & O'Carroll, 2003). However, it needs to be noted that both cognitive slowness and motor slowness contribute to this psychomotor retardation.

There is also some research looking at the various aspects of attentional deficits in depression. Depressed people display impaired performance on the CANTAB, which is, conceptualized a measure of concentration and attention (Shah, O'Carroll, Rogers, Moffoot, & Ebmeier, 1999). They also demonstrate impaired vigilance and sustained attention (Christensen, Griffiths, Mackinnon, & Jocomb, 1997) as well as focused attention related to verbal recalls (Hertel & Rude, 1991). Moreover, depressed people are found to have difficulty in selective attention. For example, they display interference by the "off task" stimulus when they were asked to respond to the target "on task" stimulus (MacQueen, Tipper, Young, Joffe, & Levitt, 2000).

The other field which received lots of interest and attention in investigating cognitive deficits in depression is that of "central executive functioning". Central executive functioning refers to a set of higher level cognitive functions such as planning, reasoning, problem-solving which involve the organization, control and allocation of cognitive resources (Channon, 1996). Depressed people are found to be impaired in various aspects of cognitive tasks in which central executive functioning is involved. For example, they show poor performance on the

planning task such as the Towers of London Task from the CANTAB (Elliot, Baker, Rogers, O’Leary, Paykel, Firth, Dolan, & Sahakian, 1997; Purcell, Maruff, Kyrios, & Pantelis, 1997) and the multiple scheduling task (Channon & Green, 1999). They also demonstrate difficulties on the Wisconsin Card Sorting Task (WCST; Heaton, 1981). Plenty of research, therefore, has suggested pervasive impairments in central executive functioning in depression.

1.2.2 AM and AM Deficit in Depression

Memory is an area where considerable biases in depression have been observed. This section will carefully review general memory biases in depression before examining autobiographical memory (AM) deficits in particular. This section will be given extensive explanation, as AM is a major area of focus in this thesis.

1.2.2.1 General Memory Deficit in Depression

Plenty of research has demonstrated that memory deficits are associated with the presence of depression on a variety of tasks and that this deficit is modifiable through antidepressant or other therapies (see Burt, Zembar, & Niederehe, 1995 for a review). However, the manifestation of the memory bias depends on the processing involved in the task; the features of the stimuli as well as the characteristics of the patient are significant. Consider first the effects of patients’ characteristics across studies. Bipolar patients have worse memory performance than unipolar patients. Depressed inpatients demonstrate more serious memory deficits than outpatients (Cohen, Weingartner, Smallberg, Pickar, & Murphy, 1982;

Niederehe, 1986; Raskin, 1986; Sweet, Newman, & Bell, 1992; Weingartner & Silberman, 1984).

Another important factor for these inconsistent findings is the different stimuli that are used across studies, such as verbal versus visual, positive versus negative (Burt et al., 1995). Burt et al.'s review demonstrated a consistent conclusion that a greater depression effects was caused by positive cues than by negative or neutral stimuli. However, research using visual or verbal stimuli in studying memory in depression revealed inconsistent findings. For example, in recall studies, some research demonstrated greater depression effects for verbal stimuli; others demonstrated greater depression effects for visual stimuli. In recognition studies, some research demonstrated greater depression effects for verbal stimuli but other did not find a significant difference between these two types of stimuli (see Burt et al. 1995 for a review).

With respect to episodic memory and semantic memory, considerable studies have revealed a strong association between depression and episodic memory, mostly in the free recall tasks (Backman & Forsell, 1994; Ilsley, Moffoot, & O'Carroll, 1995). Source memory is defined as the ability to specify the contextual information (i.e., spatial-temporal information and semantic-perceptual details) about a memory (Drummey & Newcombe, 2002; Johnson, Hashtroudi, & Lindsay, 1993). Source memory was often found to be impaired in depressed people or patients with prefrontal lobe lesions (see Drummey & Newcombe, 2002 for a review). In contrast, there is no clear evidence demonstrating that semantic memory impairments occur in depressed people. Implicit memory and short-term

memory also seem to be intact (Channon, Baker, & Robertson, 1993; Ilsley et al., 1995). Channon et al. also argued that depressed people performed more poorly on working memory tasks where central executive functioning is involved, but they did not show a consistent impairment in all cognitive tasks involving central executive functioning.

1.2.2.2 The Structure of Autobiographical Memory

In this section, the definition of AM will be introduced. The structure and mechanism of AM will also be demonstrated. There have been consistent findings about deficient AM retrieval in depression and other mental disorders. This deficient retrieval mainly takes the form of overgeneral retrieval as well as the greater accessibility of negative information. The development of this overgeneral retrieval bias will be discussed in terms of description theory (Norman & Bobrow, 1979; Williams & Hollan, 1981). Possible mechanisms of deficient AM retrieval underpinning this dysfunction in depression will also be introduced in terms of clinically and experimental findings.

AM has received considerable attention and research over the decades. There has been plenty of work focusing on the nature and function of AM (Williams & Broadbent, 1986; Williams & Dritschel, 1988; Conway & Rubin, 1993; Williams, Ellis, Tyers, Healy, Rose, & MacLeod, 1996). Robinson (1992) defines AM as both autobiographical information about oneself (e.g., name, profession, home address, interest and any personal information identifying oneself from the others) as well as one's memory concerning one's past life-experiences (e.g., celebrating

my 20 year old birthday when I was in university).

There is clear evidence that autobiographical recollections are structured in a hierarchical form, where information is stored at different levels of specificity within the memory system (Conway & Rubin, 1993; Conway, Pleydell-Pearce, & Whitecross, 2001; Williams, 2004). In Conway and Rubin (1993), an autobiographical knowledge base has been proposed to explain this hierarchical structure of memory in terms of three distinct levels. These are lifetime periods, general events and event-specific knowledge. Lifetime periods refer to a period of time in one's life, for example, "When I was in university" or "When I lived in London". General events refer to the life events that happen repetitively such as "playing squash on Fridays" or the extended events lasting several days, weeks or months. It is suggested that these general events offer more specific information than the lifetime periods. The third category is event-specific knowledge, which refers to highly specific time periods of seconds, minutes, or hours, e.g., "Going to the cinema with a friend on Sunday night". Memory in this level is characterized by sensory information and can be retrieved in the form of images (Conway, 1995).

Conway and Rubin (1993) have suggested that information at one level provides materials to access information within another level of the knowledge base; this is in line with Williams and Hollan (1981). It is also proposed that the retrieval of recollections works in a cyclical manner and is mediated by the central executive. This mechanism for retrieval searches the related information using a description created on the basis of the cues provided. Then an evaluation is made

to decide to terminate the search or to continue, depending on whether the output matches the cues provided. The description of memory will be elaborated in the process of searching with reference to the related knowledge schema in order to predict more features of the target output.

1.2.2.3 Working Self and Goals

Working memory refers to the ability to co-ordinate mental operations during cognitive activities by utilizing past experiences stored within the memory system (Hitch, 2005). One concept, which is closely related to working memory, is the working self, highly similar to the self-schemas proposed by Markus and Ruvolo (1989). Markus (1977) indicated that there is a set of self-schemas that consists of a set of memory representations of conceptions of the self, through which cognition and action are modulated. However, Conway and Pleydell-Pearce (2000) indicated that the concept of “working self” is constrained or grounded in AM in terms of the ranges and types of the goals that an individual holds. Working self directs the process of constructing AM and is also responsible for the specific memory encoding and retrieval. There is well established evidence that memory processes (i.e., encoding and retrieval) are associated with goal attainment. For example, Markus (1977) found that people with a marked dependent-independent schema showed a memory preference of experiences when they have behaved in a dependent or independent ways. The self-memory effects were further examined by McAdams (1982, 1985; McAdams, Diamond, de Aubin, & Mansfield, 1997). McAdams (1982) categorized participants into either a high intimacy motivation group or a high power motivation group by using the Thematic Apperception Test

(TAT; Murray, 1938, 1943). He found that people in the high intimacy group retrieved peak experiences with a preponderance of the intimacy theme in a subsequent memory recall test, while people in the high motivation group revealed more peak experiences of the power theme. The results suggested that the goal structure of the working self makes the experiences and recollections more accessible and more related to the current goals. Conway and Holmes (2004) investigated free call memories in older adults from each decade of their life. They found that the memory theme recalled in a specific decade was associated to the psychosocial theme that corresponded to that age stage. Taken together, previous research has shown that knowledge about the goal and the working self influence the autobiographical memory process in terms of both encoding and retrieval. However, this goal-directed cognitive process might not necessarily operate through conscious awareness. For example, Thorne (1995) found that the content of free recall across life span corresponded to the “developmental truth” (i.e., the memories from childhood refer to experiences of needing help, approval and love from parents; the memories from late adolescence are centered on the theme of assertiveness as well as reciprocal love and help). However, the participants were unaware of the personal goals in their free recall memories. Hence, the goal and working self play an essential role in the autobiographical memory construction but in a nonconscious way.

Recent work by Klein, Cosmides, Costabile, and Mei (2002), based on literature review and evidence from a case study, also suggested that the knowledge about the self consists of two functionally isolable components: episodic self-knowledge and semantic self-knowledge. Episodic self-knowledge

refers to the representations of personal experience, which happen in a particular time and space. In contrast, semantic self-knowledge refers to trait self-knowledge, the descriptions about one's own personality. In Klein et al. (2002), they investigated memory for self-knowledge in a participant R.J. with autistic symptoms, compared to a normal control. They found an episodic-semantic dissociation, such that his episodic self-memory was damaged but the semantic self-knowledge was intact.

Semantic self-knowledge also appears to be different from the other domains of semantic knowledge such as knowledge of category membership or facts about public events. Klein et al. have proposed that the self is constructed and influenced by specific semantic memory process, which is distinguished from other domains of semantic knowledge. It was indicated that the semantic memory is responsible for the processing of culturally shared information (cf. Klein et al., 2002). A case study investigating semantic memory deficits in patient D.B. (Klein, Rozendal, & Cosmides, 2002) revealed that his semantic self-knowledge was accurate but he possessed deficits in other domains of semantic knowledge. The results supported that the argument that there are different subsystems within semantic memory, which function independently. One of these subsystems is specifically responsible for the storage and retrieval of knowledge about oneself.

Klein's work provided some insights into the research of memory. The memory about one's experiences and the memory about one's personality traits are functionally independent. Personal semantic knowledge is also isolable from the other semantic knowledge. The results suggested that human mind has a

specific learning subsystem, which is responsible for self-related knowledge.

1.2.2.4 Depression and AM Retrieval

Depression influences the retrieval of AM in several ways. First, there is a bias in the retrieval of different valenced memories in terms of speed of retrieval and the proportion of negative and positive memories retrieved (Clark & Teasdale, 1982; Lloyd & Lishman, 1975). Secondly, there are biases in the retrieve of AM that vary in their level of specificity. Healthy people are able to search within this hierarchy of memory structures fluently. When they are requested to retrieve a specific memory, they start with the higher level where the general memories are stored. Then they move to the lower level to access a specific memory in response to task demands. However, in depressed people the searching stays at the higher level and fails to reach the lower level to generate a specific memory (Williams, Teasdale, Segal, & Soulsby, 2000). The latter will be discussed in more details in the following paragraph.

Research found that depressed people tend to produce more general memories when they are asked to retrieve a specific memory about themselves in response to a cue word. Employing the 10 cue words that Robinson (1976) had used, Williams and Broadbent (1986) first systematically examined this memory retrieval bias by using the word-cuing task among overdosed and depressed patients, hospital control patients, and normal controls. They found that the suicidal patients were less likely to respond with a specific memory when first given a cue, and required more prompting to produce a specific memory than the

other two groups. A possibility that the overgeneral responding was due to cognitive sluggishness as a result of the after-effects of experiencing a drug overdose was ruled out by using a Semantic memory task, which is sensitive to drug effects (Baddeley, Emslie, & Nimmo-Smith, 1992). Both the suicidal group and the hospital control group were found to be equally cognitively sluggish relative to healthy controls. Yet only the suicidal group was significantly more general in their memory retrieval. Thus, this result from the Semantic memory task was different from the results of the AM retrieval task. The normal group and hospital control group demonstrated a pattern of specific AM retrieval, whereas the overdose group showed a pattern of overgenerality. The recent nature of the crisis itself might have affected memory processes (Williams et al., 1996).

One theoretical issue is the reliability of this overgeneral memory phenomenon. This effect was first found with overdose patients. Subsequent research has shown the effect to be present in people with a diagnosis of primary major depression (Moore, Watts, & Williams, 1988; Williams & Scott, 1988; Puffet, Jehin-Marchot, Timsit-Berthier, & Timsit, 1991). Thus, overgeneral memory bias is a robust phenomenon in both suicidal and depressed groups.

This overgeneral memory retrieval has also been observed in other groups of patients who suffer from various mental disturbances. McNally, Lasko, Macklin, and Pitman (1995) as well as McNally, Litz, Prassas, Shin, and Weathers (1994) investigated AM retrieval in patients suffering from Post Traumatic Stress Disorder (PTSD). They used a modified version of the AMT by employing both positive (e.g., comradeship) and trauma-related words. Either a combat-related or

a neutral film was played to the participants prior to the memory task. The results demonstrated that PTSD patients showed a general memory retrieval style as depressed patients. Coleman and Conway (1991) examined the AM retrieval in schizophrenic patients and depressed patients. They found that, in accordance with the results found in depressed patients, schizophrenic patients demonstrated general memory retrieval, and this tendency was associated with the negative symptom of schizophrenia rather than the positive symptoms.

Interestingly, overgenerality is not associated with all mental disturbances. Two other studies that have examined the specificity of AM retrieval in anxious people (Burke & Mathews, 1992; Richard & Whittaker, 1990) have not found the same memory retrieval bias. Little evidence for overgenerality was found even in the group of clinically anxious patients although a mood congruent effect on the latency effect to retrieve the events was found. However, in a recent work by Wenzel and Jordan (2005), there were no differences found between anxious, angry and healthy controls in terms of retrieval latency, coding of specificity and affective tone. However, both angry and anxious participants rated their memories as more unpleasant and had distorted appraisal to their personal memories.

Williams and Dritschel (1992) have recognized that overgeneral memory occurs in two forms: extended memory and categoric memory. They investigated AM retrieval in response to both positive and negative cue words. Most of the errors fell into one of the two categories. However, although these two superordinate memories are both intermediate descriptions, they are functionally independent from each other. As it was further examined in the study by Williams

and Dritschel (1988), both the suicidal patients and controls provided an almost equally proportion of extended memories (7% versus 7.5%). However, the suicidal patients did provide more categoric memories than controls (18% versus 8%). The results demonstrated that it's the categoric memory that is associated with the emotional disturbance. The original description failed to explain why only the categoric memory was retrieved if the overgeneral memory was the result of a truncated searching. Williams (1996) suggested that an inhibition of intermediate categoric memory description is necessary for successful specific memory retrieval as it allows more contextual information to come into the memory process. Reduced working memory capacity is responsible for this truncated searching process. He also argued that categoric memory retrieval is associated with the low central executive functioning capacity.

More recently, the association between overgeneral AM and other facets of memories in major depression was investigated. In Raes, Hermans, Williams, Demyttenaere, Sabbe, Pieters and Eelen (2005), the major depressed patients received several cognitive tasks such as the AMT cueing task, Forward Digit Span and Letter-Number Sequencing (subscales in WAIS-III; Wechsler, 1997), Verbal fluency tasks, and Auditory Verbal Learning Test (Rey, 1964). The results revealed that reduced specificity of AM was associated with poor working memory (i.e., central executive functioning) and poor resource memory. In line with Ramponi, Barnard, and Nimmo-Smith (2004), this overgeneral AM deficit was not a general memory deficit and might be “one facet of a wider deficit in recollecting specific properties of past events” (Ramponi et al., 2004, pp. 657). They also argued that one possible explanation for this memory deficit was

rumination thinking, which has a significant negative correlation with AM specificity and resource memory performance. It was speculated that ruminative thinking is mainly a verbally based engagement that hinders the hierarchical search in the memory system so that it stays at an intermediate level where only an overgeneral AM will be retrieved (Ramponi et al., 2004; Williams, 2004).

There are some controversies about whether overgenerality is a state-dependent phenomenon. Some research indicated that it still exists when the depression has remitted (Williams & Dritschel, 1988). Thus overgenerality seems to be a cognitive style, which renders remitted depressed patients more vulnerable for further depressive episodes. Brittlebank, Scott, Williams, and Ferrier (1993) in a longitudinal study found that even patients in remission remained impaired in their ability to retrieve specific memories compared with the level found in hospital and normal controls. Moreover, Mackinger, Pachinger, Leibetseder and Fartacek (2000) also found an overgeneral retrieval style on the AMT in currently nondepressed women with lifetime prevalence of major depression when compared to the women without lifetime prevalence of major depression. However, more recent research looking at the effect of Mindfulness-based cognitive therapy (MBCT; Teasdale, Segal, & Williams, 1995) in depressed patients has demonstrated that this deficient memory retrieval style is modifiable. MBCT is a practice designed to help the individual to focus his attention on the “here and now” experience, using a focus on the breath as an anchor. This attention control training combines the stress-reduction and relaxation training proposed by Kabat-Zinn (1990), which can help patients to reduce chronic pain and anxiety symptoms (see Williams et al., 2000 for a review). By teaching the

patients to focus their attention on their current experience in a nonjudgmental way, MBCT encourages patients to pay attention to specific information more efficiently. As a result, specific retrieval is more likely to occur. Williams et al. suggested that MBCT has important clinical implications as it helps to reduce the overgeneral memory, which is a deficit in depression. It was also shown that the effect of MBCT in treating depressed people is a function of depressive chronicity. Teasdale, Segal, Williams, Ridgeway, Soulsby, and Lau (2000) found that only the depressed patients who had experienced three or more depressive episodes responded well to the MBCT. They argued that the MBCT is effective only when the ruminative-thinking cycles reactivated by dysphoric mood becomes autonomous. According to this suggestion, depression is less likely to be provoked by external events but is more likely to be mediated by the ruminative thinking style. Therefore, the MBCT has a pronounced effect in treating the relapse of depression in chronic depressed among those in whom the depressogenic ruminative thinking has already become autonomous.

Another theoretical issue is the development of this overgeneral memory. Descriptions theory (Norman & Bobrow, 1979; Williams & Hollan, 1981) has been used as an explanatory framework to account for this overgeneral retrieval phenomenon. According to this theory, people are only encoding part of the information from the outside environment. To encode or retrieve any information, a partial description is formed that provides an entry point of the memory, and the description acts as an index for the memory packet (cf. Williams et al., 1996). Williams and Dritschel (1988) assumed that depressed patients were accessing an intermediate description, but stopping short of a specific example; and it was this

truncated search, which was responsible for overgeneral memory response. However, the descriptions theory itself seems too general to explain the overgeneral retrieval phenomenon. The issue is why do people retrieve categoric memories: why do they have more difficulties in retrieval when the categoric intermediate description is involved? When a specific memory is required to achieve a successful strategy, the relatively automatic categoric description memory process needs to be inhibited at the same time. According to previous studies (see Williams et al., 1996 for a review), this ability develops during the third and the fourth year of life. This control ability might be affected by chronic stress during childhood. Children in this stage begin to talk to their parents about particular events that have happened, rather than the general features of events. However, if the child is experiencing traumatic events or is under stress during this time, he or she might tend to retrieve the memory in a more generic way as a defense strategy in coping with the negative overwhelmingly emotional impact. However, if this overgeneral retrieval style has been persistently adopted, it will lead to mnemonic interlock in which the memory system might not retrieve specific memory. This is because the intermediate memory descriptions that usually help in the retrieval of specific events only succeed in cueing further generic descriptions (Williams et al., 1996).

Indeed, Kuyken and Brewin (1995) have investigated the AM function in depression and reports of early abuse. They found that patients who reported childhood sexual abuse produced more general memories to both positive and negative cues. This is consistent with one hypothesis in which negative events occurring in childhood might lead to the adoption of a general style of encoding

and retrieval as a means of minimizing the negative effect. Moreover, Hermans, Defranc, Raes, Williams, and Eelen (2005) investigated the association between reduced AM specificity and avoidant coping in a student sample. They found that the number of specific memories on the AMT is negatively correlated with the extent of avoidant coping style. This study provides some evidence that the reduced memory specificity plays a role in affect regulation. By retrieving general memories, individuals avoid the negative impact of the unpleasant experiences.

1.2.2.5 Consequences of Overgeneral AM Retrieval in Depression

There is evidence that the overgeneral memory retrieval style associated with depression may lead to several consequences, such as poorer social problem solving performance and negative expectations towards the future. The relationship between overgeneral memory and social problem solving was demonstrated in Pollock and Williams' study (2001). These authors reported a positive correlation between the number of specific AM retrieved and the performance on hypothetical social problem task (MEPS; the Means-Ends Problem-Solving Procedures, Platt & Spivack, 1975a). Their results demonstrated that people who retrieved more specific memory tended to produce more instrumental means for solving the hypothetical social problems and produce more effective solutions. More evidence suggesting a relationship between autobiographical memory recall and SPS performance will be discussed in greater detail later (see Section 1.4.3).

Williams et al. (1996) examined whether the specificity with which people

retrieve episodes from their past determines the specificity with which they imagine the future. They found that suicidal patients did have difficulty picturing the future in a specific way compared to matched controls, a difficulty that affected their responses to positive, negative, and neutral cues. The degree of difficulty in generating specific images of the future was found to be correlated with the extent to which participants failed to retrieve specific AMs from the past. In another two experiments, they used experimental induction of different retrieval styles. Participants who had been instructed to retrieve specific events from their past were more likely to generate more specific images of the future than were participants who had been instructed to retrieve generic memories. This association can be explained by “descriptions theory”. Williams et al. (1996) suggested that people use the same intermediate descriptions in generating images of possible future events. The construction of specific models of the future appears to rely on accessing specific events representations from memory. In the absence of specific information from AM, the participant is more dependent on these general descriptions as the database for generating the images of the futures. This deficit in imaging the future may result in difficulty in solving everyday social problems, a difficulty faced by depressed patients. More work has to be done by looking at the relationship between the overgeneral memory bias and the ability to image their future.

1.3 Rumination/Distraction and its Association with Depression

1.3.1 Self-focused Attention in Depression

The role of attention in depression has been widely studied in past decades (Hamilton & Ingram, 2001; Hollon & Kendall, 1980; Ingram, 1990; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Teasdale & Barnard, 1993). Although the terminology may differ (automatic thoughts, self-statement, rumination, depressive interlock, etc), they all indicate a heightened private self-awareness, or named self-focused is associated with depression (Smith & Greenberg, 1981; Ingram & Smith, 1984; Smith, Ingram, & Roth 1985). Self-focused attention has been defined as an awareness of internally generated information that stands in contrast to an awareness of externally generated information derived through sensory receptors (cf. Ingram, 1990). In Pyszczynski and Greenberg (1987), a diathesis-stress model was suggested such that self-focus increases negative affect by activating the (negative) self-schema in depressed people after a loss or failure when compared to nondepressed individuals. Self-focus or self-regulation theory emphasizes either the discrepancy of the goal that one would like to achieve and current behaviours, or the discrepancies between the real self and ideal self (Carver & Scheier, 1981; Pyszczynski & Greenberg, 1987; Nolen-Hoeksema, 1991). Although focusing on this failure to achieve desired goals can lead to depressed mood, Nolen-Hoeksema (1991) argued that even if a personal failure is not involved, the depressed mood could still be maintained by the ruminative negative thought. Correlational studies have revealed that rumination predicted depressed mood even after the negative self-evaluation was taken into account (Nolen-Hoeksema & Morrow, 1993).

1.3.2 Rumination/Distraction as a Thinking Style

Nolen-Hoeksema (1991) proposed a response style theory to explain the occurrence and maintenance of depression. This theory stipulates that there are two major components that act in antagonistic ways to respond to depressed mood. The first component is rumination. Ruminative responses can be defined as behaviour and thoughts that focus one's attention on one's depressive symptoms and on the implication of these symptoms. Ruminative responses may include isolating oneself to think about one's symptoms (e.g., thinking about how tired one feels), possible causes of the depression (e.g., asking oneself "Why do I get depressed when other people don't?"), and the possible consequences of depression (e.g., thinking "I'm not going to be able to finish my work if I keep feeling this way"; cf. Nolen-Hoeksema, 1987, 1990). Distraction is the second component. Distracting responses refer to thoughts and behaviours that take the individual's mind off his or her low mood and promote engagement in pleasant or neutral activities. Examples include observing the objects in one's surroundings, engaging in an activity with friends to distract oneself from one's mood, or working on a hobby that takes concentration (Nolen-Hoeksema, 1991, pp. 569). Rumination in this context thus refers to a passive response to depressed mood, which should be distinguished from adaptive emotion-focused coping responses (Luminet, 2004).

This responses style theory has been supported by both laboratory studies (Morrow & Nolen-Hoeksema, 1990) and correlational studies (Nolen-Hoeksema, 1991; Lyubomirsky, Caldwell & Nolen-Hoeksema, 1998). In Morrow and Nolen-Hoeksema's study (1990), it was found that participants made to engage in an active, distracting task for 10 minutes showed complete relief from an induced

depressed mood, whereas those made to engage in a passive, ruminative task showed no relief from their depressed mood. Subsequent research has shown that rumination has detrimental effects on either maintaining or prolonging the severity of depressed level in people with low mood (Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Parker & Larson, 1994; Nolen-Hoeksema, 2000; Watkins, Teasdale, & Williams, 2000). Nolen-Hoeksema (1991) argued that people who engaged in ruminative responses when depressed tend to remain depressed and may become more severely depressed than people who try to distract themselves from their depressed symptoms. Furthermore, women's tendency to have a more ruminative response style than men may help to explain why they are more likely to be depressed and to report longer period of depression.

Additional research has investigated the relationship between some social-cognitive variables, e.g., AM retrieval and SPS ability, and the responses style theory of dysphoria/depression. Lyubomirsky et al. (1998) found that when dysphoric students were induced to ruminate, they came up with negative memories from their past (e.g., "Everyone passed the test except me"; "My girl cheated on me in Santa Barbara"; "Parents forced me to choose between them after their divorce") and felt that negative events were more frequent in their lives than positive ones. However, rumination alone, in the absence of dysphoria, was not associated with remembering negative life events. Watkins, Teasdale and Williams (2000) tested whether the cognitive manipulation of rumination versus distraction could influence memory retrieval in clinically depressed patients. In contrast to Lyubomirsky et al. (1998), Watkins et al. (2000) looked at the

specificity of the retrieved memory. They found that distraction significantly reduced overgeneral autobiographical memory, whereas the rumination induction maintained overgeneral memory at a preinduction level.

Lyubomirsky and Nolen-Hoeksema (1995) examined the relationship between depression, rumination and problem-solving. They concluded from some correlational studies that people who are prone to ruminate when dysphoric show more dispositional pessimism and less of a tendency to engage in active problem-solving in stressful times, which has been supported by laboratory and field studies (cf. Nolen-Hoeksema, 1991). The effect of negative mood on memory and information processing is one reason why ruminative responses might influence problem-solving (Ingram & Smith, 1984; Hertel, 1998). Lyubomirsky and Nolen-Hoeksema (1995) argued that, by the activation of the network of negative memories, ruminative responses may lead to negatively biased interpretations and pessimistic causal explanations for events in one's life. In their study, it was discovered that rumination might impair problem solving ability among dysphoric people through its negative effect on thinking. For example, depressed ruminators might be more likely to appraise their problems as significant threats to well-being, to believe that there are few solutions, to have self-doubts about their ability to solve them, or to give up hope on them completely. Lyubomirsky, Tucker, Caldwell, and Berg (1999) explored why the ruminators are poor problem solvers. The results showed that dysphoric ruminative thought is characterized by a focus on personal problems combined with a negative tone, self criticism, and self-blame for problems as well as reduced self-confidence, optimism, and perceived control. Furthermore, they

revealed a direct relationship between the negatively biased content of ruminative thoughts and reduced willingness to solve one's problems.

Lyubomirsky et al. (1998) found that rumination enhances the recall of negative events in dysphoric participants, and makes the dysphoric participants rate positive experiences as occurring less frequently in their life. Rumination was also found to be associated with the dysfunctional AM retrieval in the form of categoric AM retrieval. In contrast, distraction significantly reduces the dysfunctional AM retrieval of categoric AMs in depressed people (Watkins et al., 2000). Rumination was also found to influence the interpretation of hypothetical problematic situations; dysphoric people who ruminated endorsed more negative, biased interpretations of these situations than their distracting counterparts (Lyubomirsky & Nolen-Hoeksema, 1995). In a subsequent experiment within the same study, they also produced less effective solutions to hypothetical social problems. Watkins and Baracaia (2002) also demonstrated that manipulating thinking strategy during the SPS process also influenced SPS performance. They found that state-orientated ruminative questions (e.g., focusing on *why* you have a problem) significantly impaired SPS performance in the recovered depressed group; whereas the process-focused ruminative questions (e.g., focusing on how you decided to solve problem) improved SPS performance. More recently, Donaldson and Lam (2004) revealed an association between rumination, negative mood, and SPS. Depressed patients with higher levels of trait rumination reported poorer mood and generated less effective solutions on the MEPS. Moreover, manipulating state rumination using an induction procedure also resulted in poorer mood as well as impaired SPS performance. The most novel finding from their

study was that the distraction manipulation improved mood and problem solving in patients who were not trait ruminators. The findings imply, therefore, that trait rumination can interfere with the effects of a distractor manipulation.

It needs to be pointed out that the term “response style” originally used by Nolen-Hoeksema (1991), was replaced by “thinking style” in this thesis. The reason for this change is that a manipulation of rumination versus distraction was used in the experiments of this thesis. This was designed to influence the thinking style in the participants: thus, a thinking style is regarded to be more appropriate than a response style, though the content of manipulation remains the same.

There are consistent findings suggesting that rumination is maladaptive and perpetuates depression (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 1993; Nolen-Hoeksema, 2000). However, more recently, there has been some research starting to look at the distinct forms of self-focused attention, which can be either adaptive or maladaptive functions in depression (Barnard, Watkins, & Ramponi, 2006; Trapnell & Campbell, 1999; Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Watkins & Teasdale, 2004). This theory is firstly derived from the Interacting Cognitive Subsystems (ICS) framework by Teasdale and Barnard (1993). Teasdale (1999) argued that, in terms of the ICS framework, there are two levels of meaning, the propositional level and the implicational level. The propositional level is represented by the specific and explicit meaning, which can be conveyed in a sentence, whereas the implicational level is represented by higher order implicit meanings and recurring patterns and themes. The implicational level is regarded as the only level on which the emotion results. These two subsystems are

central to mental activities such as maintaining emotional states or sustaining emotional processing. Watkins and Teasdale (2004) extended this framework by investigating adaptive and maladaptive self-focus in depression. Experiential self-focus is regarded as adaptive in the regulation of emotion. It also corresponds to the concept of mindfulness proposed in MBCT (cf. Williams et al., 2000). Both mindfulness and experiential self-focus emphasize the ability to direct one's attention to internal states and feelings. In their study the mode of self-focus, experiential versus analytical, was manipulated and AM retrieval measured pre- and post the manipulation. The results demonstrated that experiential self-focus significantly reduced overgeneral AM retrieval compared to analytical self-focus. In a different study, Watkins (2004) used two distinct instructions, a conceptual-evaluative mode of self-focus or an experiential mode of self-focus, whilst the participants were instructed to write about an experience of failure. In the conceptual-evaluative condition, participants were instructed to write about the causes, meanings and reasons for an induced failure experience, such as "Write about why you feel the way you do after the test; write about what reasons might have caused you to perform as you did". In contrast, participants in the experiential condition were required to write about the direct feelings that occurred moment by moment while approaching and solving the problem as well as at the present time. An example would be "Write about how you feel - describe your feelings moment-by-moment during the test and right now; write about how you approached the problems and your thinking process as you tried to find the answers" (Watkins, 2004, pp. 1043). He found that, in contrast to the experiential self-focus processing, the conceptual-evaluative self-focus processing was associated with a worse mood and more intrusions about failed performance.

In summary, the results of recent research have shown that rumination is associated with the course of depression, whereas distraction leads to significant relief from the depressed mood. It has also been shown that when depression is present, the manipulation of distraction can reduce the production of categoric AMs and also make social-problem solving more effective. In addition, more recently, rumination has also been demonstrated to have distinctive modes that serve different functions. These functions can either prolong the detrimental effects caused by depression or enhance the mood and cognitive performance in depression.

1.4 Social Problem Solving and its Association with Depression

1.4.1 Social Problem Solving Theory

In the literature, there are various ways to define and conceptualize social a problem-solving. However, there is a consensus that social problem-solving refers to the process of solving problems that are encountered as a result of daily living (D’Zurilla & Maydeu-Olivares, 1995). Firstly, the term “social” can be employed to refer to any problem-solving that influences our adaptive functioning (see D’Zurilla, Nezu, & Maydeu-Olivares, 2004). It would therefore incorporate the solution of intrapersonal problems (e.g., emotional problems faced by an individual) as well as interpersonal problems (e.g., conflicts between individuals). Next, the term “problem” has been identified by D’Zurilla and Goldfried (1971) as a life situation that necessitates a response for adaptive functioning but that

response is not available to the person due to the existence of obstacles. The term “solutions” refers to “a response or set of responses which alters the situation, or one’s emotional reaction to it, or both so that it is no longer problematic to the individual and at the same time maximizes other positive consequences and minimizes other negative ones” (D’Zurilla & Goldfried, 1971, pp. 108-109).

When the definitions to each term are considered together, successful social problem solving can be conceptualized as the ability to interpret real-life problem situations within the schema of past experience, to generate effective solutions and to carry out the actions. Adaptive functioning to meet personal and environmental demands is then a product of this problem-solving process.

1.4.1.1 Concepts and Dimensions of Social Problem Solving Model

A stage model of social problem-solving has originally been proposed by D’Zurilla and Goldfried (1971) ¹ and then recently expanded and revised by D’Zurilla, Nezu and Maydeu-Olivares (2004). In the revised model there are three major components, which are (1) problem solving, (2) problem, and (3) solution. As noted by the researchers, it is important to distinguish between the problem solving and solution implementation.

First of all, problem solving refers to the cognitive-behavioural process of identifying the problematic situation and generating several possible alternatives

¹ A stage model proposed by D’Zurilla and Goldfried (1971) consists of five stages: (1) general orientation, (2) problem definition and formulation, (3) the generation of alternatives, (4) decision making and (5) solution implementation and verification.

to that specific situation. This process is aimed at either changing the problematic situation itself or ameliorating the emotional stress, or both. Secondly, a problem (or problematic situation) refers to any real life situation in which a response is needed in order to change it to a more adaptive level. However, no solutions are immediately available as a more conscious and effortful activity is required to deal with the difficulties in the problematic situation. Thirdly and lastly, the solution refers to a coping response, which is specific to that problematic situation. A successful solution will decrease the negative impact brought by the problem and increase the maximum positive influence to both sides in an interpersonal problem situation (cf. D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

Problem-solving and solution implementation are two different processes in social problem solving when viewed from both a theoretical perspective and from the results of experimental studies. Different skills are required to accomplish these two processes. Problem-solving refers to the process of finding a solution to a problem situation whereas solution implementation refers to carrying out an action to solve the problem. Marx, Williams, and Claridge (1992) have argued that depressed patients and anxious patients may have difficulties at different stages of the problem-solving process. Depressed patients have difficulties in the earlier stage of generating effective solutions whereas anxious patients are able to find effective solutions to the problematic situation but fail to perform the necessary behaviour to solve the problem.

Derived from the stage model of D’Zurilla and Goldfried (1971), problem-solving ability involves two different components: (1) problem

orientation and (2) problem-solving skill (later as “problem-solving proper”, D’Zurilla & Nezu, 1999; and then “problem-solving style”, D’Zurilla, Nezu & Maydeu-Olivares, 2002). As it has been described by D’Zurilla et al. (2004), problem orientation is a metacognitive process, in which a set of cognitive-emotional schemas reflect one’s appraisals, beliefs and feelings about everyday life problems as well as one’s own problem solving ability. Problem-solving skills therefore refer to the cognitive or behavioural activities aiming at solving the problematic situation. Four major skills are involved in the problem-solving skill, which are: (1) problem definition and formulation, (2) generation of alternatives, (3) decision making, and (4) solution implementation and verification. Problem definition and formulation involve collecting the information about a problem situation in order to understand its constitution and to set goals for solving the problem. Generation of alternatives refers to the production of as many solutions as possible in order to maximize the likelihood of generating an effective solution. Decision making refers to the evaluation of the advantages and disadvantages of each solution and the subsequent selection of the most effective solution from a series of alternative solutions. Solution implementation and verification refers to the actions carried out to solve the problematic situation.

1.4.2 Common Measurements of Social Problem Solving Ability

The definition of social problem-solving has been introduced in the above section. Moreover, a model of social problem solving has also been presented to highlight the conceptual structure of social problem solving. Now the three most

commonly used measurements with regard to SPS will be introduced in the following sections. The first measure (see Section 1.4.2.1 the Means-Ends Problem-Solving Procedures) was used in Study 1, 2 and 3 in this thesis. Therefore, the theoretical background and psychometric properties of the MEPS will be extensively reviewed.

1.4.2.1 Means-Ends Problem-Solving Procedures (MEPS; Platt & Spivack, 1975a)

The MEPS is a hypothetical social problem task that involves means-ends thinking. Means-ends thinking refers to the process of identifying the individual steps required to move from a given problematic situation to a positive outcome. As described by the authors there are three components: (1) the ability to conceptualize the steps or “the relevant means” which are necessary to achieve the goal, (2) the ability to anticipate the potential difficulties during the problem-solving process, (3) the ability to appreciate that a successful problem-solving process takes time (D’Zurilla & Maydeu-Olivares, 1995, pp. 442). The MEPS can be administered either by using an interview or a pencil-and-paper format. The participants are presented with 10 hypothetical social problem situations, where the happy endings, the goals to be achieved, are also provided. Participants are asked to make up the middle part of the story to link the problem situation to the goal. Problem-solving performance can be assessed in terms of outcomes measures and process measures. Overall, the MEPS is regarded as an outcome measure because of its focus on examining the quality of specific solutions to a particular problem (D’Zurilla & Maydeu-Olivares, 1995).

Process measures, in contrast, assess the general cognitive and behavioural processing involved in generating effective solutions to problems situations (D’Zurilla & Maydeu-Olivares, 1995). However, there is also evidence that process measures are used with the MEPS. Schotte and Clum (1987) developed a modified MEPS that measures process variables such as the ability to produce alternative solutions and the ability to anticipate the consequences of solving a problem in a particular way. In their study, the results revealed that suicidal patients had less alternative solutions and reported more potential negative consequences than nonsuicidal patients.

The most common outcome measure associated with the MEPS is the number of relevant mean steps reported in constructing a solution to the problem. The number of relevant means is a quantitative measure of performance. Butler and Meichenbaum (1981) have suggested that assessing the quality of the MEPS solutions may be a more viable approach in identifying subtle differences between patients and controls. According to criteria established by D’Zurilla and Goldfried (1971), effectiveness refers to “a problem solving strategy that both maximizes the positive and minimizes negative short- and long-term consequences, both personally and socially” (see Marx et al., 1992, pp. 80).

The MEPS has been criticized in several respects. First the MEPS lacks ecological validity. Specifically, some of the problem situations are regarded as being unrealistic in terms of personal experience, such as stealing a diamond. As a result the four problem situations with the greatest ecological validity have typically been used in research (e.g., being treated unfairly by a teacher/boss,

having a disagreement with parents/a partner). Finally the MEPS really assesses the ability to construct a plan to solve a hypothetical problem devoid of the normal emotional processing associated with solving social problems. Hence, it is argued that it is a measure of imaginative thinking as opposed to problem-solving.

1.4.2.2 Problem-Solving Inventory (PSI; Heppner, 1988)

The Problem-Solving Inventory is a 35-item Likert-type scale. It has been described as a measure of self-appraised problem solving ability (Heppner, 1988; Heppner, Neal, & Larson, 1984) or a measure of a person's problem-solving style (Sherry, Keitel, & Tracey, 1984). The PSI is derived from D'Zurilla and Goldfried's original five-stage problem-solving model. There are five components in that model: one general orientation component (problem orientation) and four specific problem-solving skills (problem definition and formulation, generation of alternatives, decision making, and verification). However, a principal component factor analysis has identified that the PSI consists of three subscales. They are "Problem-solving Confidence", which refers to self assurance while engaging in problem-solving activities; "Personal Control", which determines the extent of control one feels they have over emotions and behaviors while solving problems; and "Approach-avoidance Style", which refers to a general tendency to either approach or avoid problem-solving activities (Heppner & Peterson, 1982).

However, it should be pointed out that these constructs of the PSI are not theoretically based. Maydeu-Olivares and D'Zurilla (1997) conducted a content analysis of PSI and identified two meaningful constructs: problem-solving

self-efficacy and problem-solving skills. From this the Problem-Solving Self-Efficacy (PSSE) scale and Problem-Solving Skills (PSS) scale were developed (Maydeu-Olivares & D’Zurilla, 1997).

1.4.2.3 Social Problem-Solving Inventory-Revised (SPSI-R; D’Zurilla, Nezu and Maydeu-Olivares, 2002)

The Social Problem-Solving Inventory-Revised is a 52-item Likert-type inventory consisting of 5 subscales. These subscales assess problem-solving style and the ability to generate solutions and consist of the following: (1) the Positive Problem Orientation (PPO) scale, (2) the Negative Problem Orientation (NPO) scale, (3) the Rational Problem Solving (RPS) scale, (4) the Impulsivity/Carelessness Style (ICS) scale, and (5) the Avoidance Style (AS) scale. It has been indicated that higher scores on PPO and RPS scales, and lower scores on NPO, ICS, and AS scales, are associated with good problem-solving ability according to its theoretical assumptions. The RPS scale consists of 4 subscales measuring social problem solving skills, which mirror the last four stages of the social problem solving stage model (i.e., the Problem Definition and Formulation scale, the Generation of Alternative Solutions subscale, the Decision Making subscale, and the Solution Implementation and Verification subscale).

1.4.3 Social Problem Solving Deficit in Depression

There is clear evidence that poor SPS is a feature of depression. Much of this research has employed the MEPS to assess social problem-solving performance.

Gotlib and Asarnow (1979) found that depressed university students produced less relevant means on the MEPS than nondepressed students. Marx and Schulze (1991) found that depressed college students generated less effective solutions than their nondepressed counterparts. Marx et al. (1992) examined the association between SPS ability in patients with a diagnosis of major depressive disorder and patients with a diagnosis of anxiety disorder as well as a normal control group. Problem-solving ability was assessed with (1) the MEPS task, (2) the assessment of solutions to a personal problem generated by the participants themselves, and (3) the Problem-Solving Questionnaire (PSQ), a translation of the German Problemlosefragebogen (Konig, Otto, Holling, & Liepmann, 1980). Results showed that, as predicted, depressed participants suffered from a deficit in SPS on all three measures. The majority of these deficits were also displayed by the anxiety disorder patients group rather than being specific to a diagnosis of depression. However, on one key outcome measure, effectiveness of solutions on the MEPS, the depressed participants performed significantly poorer than both the normal group and the patients with a diagnosis of anxiety disorder.

The results also suggest that depressed and anxious patients may have difficulties at different stages of the problem-solving process, providing some support for the stage model of social problem-solving (Marx et al, 1992). For example, the depressed patients had difficulties in generating effective solutions to hypothetical problems where an earlier cognitive stage is involved. In contrast, the anxious patients showed impairment in implementing solutions, a later stage of problem-solving. Thus, Marx et al. (1992) provides clear evidence that an impaired cognitive style in producing effective SPS strategies is a feature of

depression. A final finding of interest was that depressed people also displayed more negative attitudes towards problems than their nonclinical controls. Specifically, the depressed patients manifested a more negative problem orientation and more disinclination to apply unconventional solutions to problems.

Other research examining the effects of depression on social problem-solving has investigated whether rumination and the ability to retrieve autobiographical memories are possible mechanisms involved in the social problem-solving process. Again most of this research has employed the MEPS. Consider first the research looking at rumination. Lyubomirsky and Nolen-Hoeksema (1995) investigated the effects of self-focused rumination on interpersonal problem-solving in dysphoric participants using the MEPS. The results indicated that dysphoric participants who ruminated generated less effective solutions on the MEPS than the dysphoric participants receiving a distraction manipulation and the non-depressed ruminators and distracters. In addition, the dysphoric ruminators were also more pessimistic towards their problem situations, such as offering more negative explanations to the social problems they had, than the other groups. Finally the dysphoric ruminators experienced greater negative mood than the dysphoric distracters. Considered together, the results demonstrated that rumination impairs SPS through the effect of negative mood in a dysphoric sample.

Another possible mechanism through which depression influences SPS is thinking style (rumination versus distraction). In contrast to the abstract self-focus which involves an abstract, conceptual and more general mode of thinking style

processing, the concrete self-focus encourages a processing style that focuses on a more concrete, direct and specific mode (Stöber, 1998; Teasdale, 1999; Watkins & Mould, 2005). It has been suggested that concrete self-focus is associated with improved social problem-solving performance, in contrast to abstract self-focusing. Watkins and Moulds (2005) further tested this hypothesis by looking at the influence of abstract versus concrete self-focus on problem-solving in depressed people. In an abstract self-focus condition, participants were given an instruction such as “Think about the way you feel inside”. In the concrete condition, participants were asked to “Focus your attention on your experience of the way you feel inside”. The items were adapted from the Nolen-Hoeksema and Morrow’s (1993) rumination task. As predicted, the concrete self-focus manipulation helped depressed people in solving the MEPS.

Thus research has demonstrated some preliminary finds that ruminative self-focus can be either helpful or detrimental depending on the nature of the self-focus. Originally derived from the concept of mindfulness, the experiential self-focus has proven to be associated with improvement in AM retrieval as well as social problem solving. More work is required to test this newly developed theory and to develop some treatment strategies based on this assumption.

The ability to retrieve AMs may be another mechanism underlying poor SPS performance in depression. Poor SPS performance on the MEPS has been found to be associated with the difficulty in retrieving specific AM in parasuicide patients (Evans, Williams, O’Loughlin, & Howells, 1992). Pollock and Williams (2001) investigated interpersonal problem-solving ability on the MEPS and AM

retrieval in suicide attempters. They found that, in contrast to the nonsuicidal psychiatric controls and normal controls, the suicide attempters were more overgeneral in their AM retrieval style and they also showed greater deficits in their interpersonal problem-solving ability. Moreover, the results demonstrated that effective interpersonal problem-solving performance in suicide attempters was associated with the ability to retrieve specific AM. Goddard, Dritschel, and Burton (1996, 1997, 1998, 2001) extended research looking at the relationship between AM retrieval and SPS by examining how AM retrieval during SPS, as well as AM retrieval on the AMT cueing task, may contribute to the quality of solutions produced in terms of the generation of relevant means and the effectiveness scores. Results supported the general hypothesis that SPS skill is a function of both AM retrieval as measured by the AMT cueing task and by the types of AMs retrieved during SPS in a clinically depressed sample. More specifically, the ability to retrieve specific AMs on the AMT cueing task was again found to be positively correlated with the successful SPS performance. Moreover, with respect to the AM retrieval during SPS, a strong association between categoric AM retrieval during SPS and poor SPS performance was demonstrated. Goddard et al. (1996) have argued that the categoric AM retrieval style facilitates ruminative thinking in depressed individuals in both positive and negative ways. When negative, this ruminative thinking style encourages poor problem-orientation towards problems. In contrast, a positive ruminative thinking style diminishes the desire to find new insight, perhaps in the form of unconventional solutions. Moreover, this ruminative thinking style limits the cognitive resources needed to successfully define and evaluate problems as well as to generate effective solutions due to a maladaptive preoccupation with the

past.

A subsequent study by Goddard et al. (2001) examined whether priming depressed individuals and matched controls to retrieve specific AMs prior to performing SPS would result in enhanced SPS performance. Priming increased the specific AM retrieval in both groups but did not improve their SPS performance. However, the priming did facilitate the ability of depressed people to retrieve memories that they subsequently rated as helpful.

Other research examining the association between depression and SPS has examined attitudes towards problem solving using self-report measures and found deficits. For example, there is some evidence suggesting that depressed people demonstrate a more negative problem orientation towards social problems (Chang & D’Zurilla, 1996; D’Zurilla, Chang, Nottingham, & Faccini, 1998; Dixon, 2000; Dixon, Heppner, Burnett, Anderson, & Wood, 1993) than their non-depressed counterparts. D’Zurilla et al. (1998) also examined the relationship between social problem-solving abilities (measured by the SPSI-R) and hopelessness, depression, and suicidal risk in college students and psychiatric inpatients. They found a significant positive association between depression level (as measured by the BDI) and NPO (the Negative Problem Orientation), the ICS (the Impulsivity/Carelessness Style), and the AS (the Avoidance Style) in both a college students sample and a depressed patients sample. In these samples, a significant negative association was also found between the depressed level and the PRO (the Positive Problem Orientation) (see Section 1.4.2.3 for the introduction of SPSI-R).

1.5 Association between Thinking Style and the AM Retrieval as well as SPS

Literature has been reviewed clearly suggesting that rumination influences both AM retrieval on the AMT cueing task and SPS performance in both dysphoric and depressed samples (Lyubomirsky et al., 1998; Nolen-Hoeksema, 1991; Watkins & Baracaia, 2002; Watkins et al., 2000). However, there has been very little research examining the interaction of these variables with the exception of Raes et al. (2005).

Raes et al. (2005) investigated the association between performance on the AMT, ruminative responses (measured by the RRS; the Ruminative Response Scale, Nolen-Hoeksema & Morrow, 1991; Raes, Hermans, & Eelen, 2003 and the RSS; the Rumination on Sadness Scale, Conway, Csank, Holm, & Blake, 2000; Raes et al. 2003) and MEPS performance in depressed patients. The results revealed that AM specificity negatively correlated with problem-solving effectiveness. Regression analyses also demonstrated that the relationship between rumination and ineffective problem solving is mediated by decreased AM specificity. They argued that reduced AM specificity affects the association between rumination and SPS effectiveness. However, this was proven in a correlational study. No causal inference can be drawn from this preliminary finding. The above results partly support the association between thinking style, AM retrieval and SPS ability. However, it is still unclear how rumination affects SPS as well as AM retrieval during SPS. More work is needed to clarify this causal relationship.

1.6 The Aim and Hypothesis of this Study

There is well established evidence that thinking style (rumination versus distraction) has a significant influence on cognitive processing when either dysphoric or depressed mood is present. Depressed individuals who ruminate produce more categoric AM retrievals and they show more impairment in SPS performance; whereas a distraction manipulation improves SPS performance as well as AM retrieval (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999; Watkins et al., 2000; Watkins & Teasdale, 2001). What remains unclear is how a rumination/distraction manipulation, administered just prior to SPS, influences AM retrieval during SPS. There is evidence that the quality of AM retrieval during SPS is related to the effectiveness of SPS solutions. Goddard et al. (1996) gave clinically depressed participants the MEPS and measured AM retrieval during SPS. They established that poorer SPS was linked to categoric AM retrieval during SPS. One aim of this thesis is, therefore, to investigate the impact of thinking style on both SPS and AM retrieval during SPS. Both dysphoric and depressed groups will be recruited to examine how the effect of thinking style interacts with the severity of depressed mood to influence SPS as well as AM retrieval during SPS.

Additionally, most of the studies investigating the association between depression, thinking style (rumination/distraction), AM retrieval and SPS have used a Western sample. Although there have been some studies looking at the culture differences in terms of AM retrieval and SPS (Chang, 1998; Wang, 2001),

these studies only examined AM recollections using questionnaires and SPS using self-report measures. These studies have also mainly focused on Asian Americans and people in China. Given that there are different manifestations within various cultures in terms of individualism versus collectivism perspectives (Eid & Diener, 2001), which could influence both AM and SPS processes, it is important to look at the influence of thinking style (rumination/distraction) on the AM retrieval and SPS from a cross-cultural perspective. That is, Western cultures are characterized as being more individualistic; Eastern cultures have a more collective perspective that focuses on the role of the individual within a society (Markus & Kitayama, 1991).

Therefore, a secondary aim is to examine the association between thinking style, AM retrieval and SPS performance from a cross-cultural perspective. Cross-cultural comparisons will be carried out to see, first, if the culture differences exist in AM retrieval on the AMT cueing task and secondly, to investigate if these associations between thinking style, SPS and AM retrieval still remain the same across different cultures.

The measures and methodologies used in the studies throughout the thesis will be described in Chapter 2. In this chapter, the clinically relevant measures will be introduced. The criteria for including and excluding the clinically depressed patients will also be specified. As has been mentioned above, cross-cultural comparisons will be conducted in two countries using the native language for that country. The cross-cultural consideration will be discussed in this chapter as well. Chapter 3 will examine the association between thinking style, SPS and AM

retrieval during SPS in a dysphoric university students sample. Chapter 4 will further examine these associations in a clinically depressed patients sample. Chapter 5 and Chapter 6 will be cross-cultural studies. Chapter 5 will examine AM retrieval on the AMT cueing task in clinically depressed patients from both U.K. and Taiwan. A second study will examine how thinking style influences SPS performance and AM retrieval during SPS cross-culturally. An identical study to Study 2 (in Chapter 4) will be conducted in a Taiwanese sample and the results will be investigated across these two samples from U.K. and Taiwan.

CHAPTER 2

MEASURES AND METHODOLOGIES

In this chapter, the measures and common methodologies employed in the experiments throughout the thesis will be introduced. The description of measures will include clinically relevant measures used to assess mood, the thinking style manipulation (rumination/distraction manipulation), the Autobiographical Memory cueing task (AMT) and a hypothetical social problem-solving task, the Means-Ends Problem-Solving task (the MEPS). Then the inclusion and exclusion criterion for the dysphoric, the clinically depressed and the healthy control groups will also be described. As this thesis is interested in examining cross-cultural differences in AM and SPS, the final part of this chapter will describe how measures are modified to make them cross-culturally equivalent.

2.1 Clinical Relevant Measures (Self-Report Measures of Mood)

2.1.1 Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erlbaugh, 1961)

The BDI (Beck et al., 1961) is a 21-item self-reported inventory measuring the degree of depressed symptoms occurring over the past two weeks (see Appendix 1). The 21-item inventory focuses on various aspects of depressed symptoms, which include subjective mood state, feelings of self-esteem, propensity to initiate action, motivation for completing tasks, as well as the quality of sleep and appetite. For each item, participants are asked to choose one of four responses that

best represent how they have been feeling during the last week. A higher score on the BDI reflects a higher level of dysphoria. On the basis of past recommendations (Beck, 1967), students with BDI scores of 15 or above were recruited for the dysphoric group and students scoring below 5 were recruited for the nondysphoric group. The BDI is the most widely used self-report measure with good reliability and validity (Beck, Steer, & Garbin, 1988; Hammen, 1997). The BDI has now been replaced by a newer form of the BDI, the BDI-II (Beck, Steer, & Brown, 1996). There is substantial evidence that the BDI correlates quite strongly with most other self-report measures of depression as well as ratings of depression severity (Beck, Rial, & Rickles, 1974).

2.1.2 Self-report Mood Questionnaires

A mood questionnaire was used to obtain a temporary measure of mood in all Study 1, 2, & 4 in this thesis (see Appendix 2), where a thinking style manipulation was administered. The mood questionnaire required participants to rate their mood on four dimensions (sad/not sad, unhappy/not unhappy, miserable/not miserable and cheerful/not cheerful) using 9-point Likert-type scales (e.g., 1 = *not at all cheerful*; 9 = *extremely cheerful*). The last dimension (cheerful/not cheerful) was reverse scored. The mood questionnaire also contained a number of filler scales (e.g., measuring levels of creativity, curiosity, bashfulness, recklessness, etc) to help disguise the study's focus on mood. Participants completed the mood questionnaire at three different time points: the beginning of the experiment and immediately after each of the thinking style manipulation (i.e., either rumination or distraction). Ratings concerning the

current mood were summed to arrive at a single measure of depressed mood for each time point. Changes in temporary mood over time were used to evaluate whether the manipulations employed in the experiment were effective. This method has been employed by Lyubomirsky et al. (1999) to evaluate the effectiveness of thinking style manipulations.

2.2 Thinking Style Manipulation (Rumination versus Distraction)

The thinking style manipulation task (rumination versus distraction) is designed to influence participants' thinking style by requiring them to focus their mind and "think about" a series of 45 items (Lyubomirsky et al., 1998) (see Appendices 4 & 5). The task administered in the experiments of this thesis was a modified version of the thinking style manipulation by Watkins (2000) based on used by Nolen-Hoeksema and Morrow (1993). The modifications consisted of making the items more appropriate for British participants (see Watkins et al., 2000, pp. 913). Consistent with Nolen-Hoeksema's (1991) original conception of a ruminative response, the ruminative condition instructs participants to focus their attention on thoughts that are emotion-focused, symptom-focused, and self-focused, although they are not told especially to think about negative emotions and negative personal attributes. For example, participants are asked to think about " your current level of energy", "why your body feels this way", "trying to understand your feelings", "your character and who you strive to be", and "why you turned out this way". In contrast, participants in the distraction condition are required to focus their attention on the thoughts that are externally focused and not related to symptoms, emotions, and the self. For example, they

are asked to think about “clouds forming in the sky”, “the expression on the face of the Mona Lisa,” and “the shiny surface of a trumpet.” In previous work using this response-manipulation task, participants spent exactly 8 minutes focusing on 45 items. In the present studies (i.e., Study 1, 2 and 4 in this thesis), we decided to administer the manipulation in two blocks because we were concerned that the effect of the manipulation might fade whilst participants are trying to solve all four problems. Thus, one half of the rumination/distraction manipulation (23 items) was administered before the first two social problems were presented for the participants to solve. The remaining half of the rumination/distraction manipulation task (22 items) was then administered before the remaining two social problems were presented. Participants spent 4 minutes on the rumination/distraction manipulation in each block.

2.3 Dependent Variables

2.3.1 Autobiographical Memory Cueing Task (AMT; Williams & Broadbent, 1986)

The autobiographical memory cueing task (AMT; see Appendix 3) is a widely used method for studying AMs (Williams & Broadbent, 1986; Williams & Dritschel, 1988; Goddard et al., 1996; Williams, Barnhofer, Crane, & Beck, 2005). This task provides a direct assessment of an individual’s ability to retrieve specific AMs. In this task, a series of cue words are presented individually and the participant is asked to retrieve a specific memory, as quickly as possible, in response to each cue word. A specific AM was explained to the participants in

terms of being a personally experienced event that happened on a particular day and place. In most investigations employing this task with depressed or dysphoric participants, emotionally valence words are used as cues. In this series of experiments, we employed the same five positive words (i.e., happy, safe, interested, successful, and surprised) and five negative words (i.e., sorry, angry, clumsy, hurt, and lonely) as used by Evans et al. (1992) and Goddard et al. (1996). Words were presented orally and visually (using an index card) to the participants in the same order listed above, with positive and negative words alternating. Participants were given a maximum of 60 seconds to retrieve a memory to each cue word. If a response was not given in that time, a score of 60 seconds was recorded and the next word was given. If the participant gave a categoric AM (e.g., playing football on Monday afternoons) within that time period, they were prompted to recall a specific instance. When a categoric AM was given within the 60 seconds and prompts were then administered for retrieving a specific AM.

Responses on the AMT cueing task could take one of four forms: a specific AM, a categoric AM, an extended AM and an omission. A specific AM refers to a memory for a personally experienced event occurring at a particular time and place and lasting less than one day (e.g., “going to a cinema with Jenny last Friday night”). A categoric AM refers to a personally experienced event that happens repetitively (e.g., “attending a computer course on Wednesday afternoons”).

An extended AM refers to a personally experienced event that occurred at a particular time and place yet lasted more than one day (e.g., “my first year at university in St Andrews”). Finally, omissions refer to any failures to retrieve a

memory. All the AM responses were coded by the author. A second rater who was blind to the membership of the participants coded a random sample of AM responses from each study using the AMT to establish inter-rater reliability. Before the task, all participants completed a practice trial with feedbacks to ensure that they understand the instruction and the requirement of the task. During the task, prompts were given if the first response was not a specific memory. Number of specific memories was calculated from the 10 possible responses to the cue words.

2.3.2 Means-Ends Problem-Solving Procedures (MEPS; Platt & Spivack, 1975a)

The MEPS is a hypothetical SPS task that has been widely used with clinically depressed and dysphoric samples (e.g., Marx et al., 1992; Goddard et al., 1996; Watkins and Baracaia, 2002).

The original version of the MEPS consists of 10 vignettes that first present a problem situation and then describes a successful resolution to the problem situation (Platt & Spivack, 1975a). The task for the participant is to describe the actions needed to move from the problem to its successful resolution. Problems revolve around social themes such as experiencing conflict with friends, getting along with one's boss, successfully stealing a diamond. The following is an example of a MEPS problem:

“You notice that your friends seem to be avoiding you. You want to have friends and to be liked. The story ends when

your friends like you again. You begin where you first
notice your friends avoiding you.”

Platt and Spivack (1975b) showed that it is not necessary to administer all 10 vignettes. In the studies of this thesis, we used four vignettes that covered the following areas: problem with a boss (for clinically depressed group)/teacher (for dysphoric student group), friends avoiding you, moving to a new neighborhood, and dispute with a partner (for clinically depressed group)/parents (for dysphoric student group) (see Appendix 6). These themes have been used in previous work by Goddard et al. (1996, 2001). An example problem was presented before beginning the actual experiment to make sure that participants understood the instructions completely. Following each MEPS task, the participants were asked to describe any memories that were retrieved whilst trying to solve each social problem.

Responses were marked on the following three criteria: (1) relevant means (that is, the number of relevant individual steps used to solve the problem [Platt & Spivack, 1975]) ;(2) effectiveness of the solution; (3) the number and type of AMs retrieved spontaneously during SPS. The relevant means measure refers to the number of relevant individual steps used to solve the problem. The effectiveness measure is marked on a Likert-type scale ranging from 1 (*not at all effective*) to 7 (*very effective*) for each problem. Scores are summed across the four problems to give each respondent a total effectiveness score and a total means score. Finally two raters categorized the memories spontaneously reported during SPS in terms of their level of specificity (e.g., specific, extended, categoric or solutions generated according to general knowledge).

Previous research has demonstrated good inter-rater reliability (.84 for relevant means and .87 for effectiveness) for the two solution measures on the MEPS (Goddard et al., 1996).

2.4 The Inclusion and Exclusion Criteria for the Depressed Participants

2.4.1 The Diagnosis of Depression

2.4.1.1 Diagnostic and Statistic Manual of Mental Disorders, 4th Edition (DSM-IV; APA, 1994)

Patients were interviewed by psychiatrists using the Structured Clinical Interview for DSM-IV Axis I disorders (APA, 1994). The Axis I disorders consist of those most commonly seen in clinical practice such as major depressive disorder and panic disorder. In order to be eligible for participation in the studies reported in this thesis, patients had to meet the diagnostic criteria for Major Depressive Disorder. The criteria consist of depressed mood, loss of interest or pleasure from activities that used to be enjoyed, sleep and appetite disturbance, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness and inappropriate guilt, difficulty in making decisions and concentration and recurrent suicidal ideation (APA, 1994). In order to receive a diagnosis of major depressive disorder at least 3 symptoms must be experienced for at least two weeks in the past month. With respect to this multiaxial organization, DSM-IV is believed to offer a particularly useful and comprehensive

description of the patient's mental disorders (Davidson & Neale, 2000, pp. 60-75). It is widely used by psychiatrists, clinical psychologists and other professionals in psychiatric settings not only as a diagnostic tool but also as a guide for communicating about mental conditions.

In the studies throughout the chapters in this thesis, all of the patients who meet the diagnostic criteria of Major Depressive Disorder according to DSM-IV will be included in the experiment if they do not meet any exclusion criterions.

2.4.1.2 Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960, 1967)

The Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960, 1967) is one of the first rating scales designed to quantify the severity of depressive symptoms and is a highly reliable and valid tool for assessing the presence and severity of depression. It is regarded as an index of severity for depressive symptoms and is most widely used in clinical settings. It consists of twenty-one items. Seventeen items are actually scored to evaluate patients' depressed mood, cognitive and vegetative symptoms of depression as well as the comorbidity of anxiety. Nine of these items are scored 0-4 (0 = absent; 1 = doubtful or slight; 2 = mild; 3 = moderate; 4 = severe) and a further 8 items are scored 0-2 (0 = absent; 1 = doubtful or slight; 2 = clearly present). Items 18-21 are not regarded as measuring the intensity of depression; thus they are commonly omitted. The total time to complete is the HRSD is 30 minutes. The patients in the present study were interviewed by psychiatrists using the HRSD before being referred to the experimenter. Eligibility for the depressed groups in the present experiments

included receiving a diagnosis of Major Depressive Disorder on a structured clinical interview using DSM-IV criteria and having a HRSD score over 14. Research has suggested that a cut-off of 14 or above is a fair indication of the presence of depressed mood (Katz, Shaw, Vallis, & Kaiser, 1995). The scoring level of HRSD is: 10-13, mild; 14-17, mild to moderate; above 17, moderate to severe.

2.4.2 The Exclusion Criteria

Any patients, whose depression is due to organic factors, e.g., brain damage, will be excluded from the experiment. The patients who are diagnosed with manic-depressive disorder will also be excluded as previous research (Murphy, Sahakian, Rubinsztein, Michael, Rogers, Robbins, & Paykel, 1999; Ridout, 2004) has indicated they have a different cognitive profile from that of patients with Major Depressive Disorders. Patients with any previous psychotic symptoms such as visual/auditory hallucination and delusions will also be excluded from experiments.

2.4.3 The Healthy Control Group

The healthy control participants were recruited from advertisements posted around the town centre. The Structured Clinical Interview of DSM-IV (the SCID; Spitzer, Williams, Gibbon, & First, 1996) was administered to ensure that the controls had no history of major depressive disorder and that they did not currently meet the criteria for a diagnosis of Major Depressive Disorder.

2.4.4 Intellectual Function

The total years of education was taken as an index of intellectual functioning for both the depressed and nondepressed control participants. Participants were matched on this criterion.

2.5 Cross-cultural Considerations

2.5.1 The Diagnosis of Depression

The Taiwanese clinically depressed patients were recruited from the Department of Psychiatry, the Chung-Shang Medical University Hospital. All the patients were interviewed by psychiatrists using the SCID to ensure all of them met the diagnosis of Major Depressive Disorder according to the DSM-IV criteria. Then patients were referred to the experimenter. The exclusion criteria consisted of those described in Section 2.4.2.

2.5.2 The Cultural Equivalent Procedures

Translation and back-translation were carried out to ensure that the two versions of experimental materials of each language were literally and semantically equivalent. The following measures were involved: the self-reported mood rating questionnaires, the AMT cueing task, the MEPS, and the thinking style manipulation (rumination and distraction manipulation).

The mood questionnaires were translated into a Mandarin-Chinese version and back-translation was administered to ensure that these two mood-measuring materials were identical in their semantic meanings.

To develop the Mandarin-Chinese version of the AMT, the Academia Sinica Bilingual Ontological Wordnet was employed. This programme provides an exact translation of the word meanings from Chinese to English as well as from English to Chinese, while also matching on word frequency.

In order to ensure equivalence in semantic meaning. Both the MEPS tasks as well as the thinking style manipulations were translated into Mandarin-Chinese by a native Chinese-speaking student from the Department of English. With respect to the thinking style manipulation, some of the items were adjusted in order to take into consideration cultural differences for the Taiwanese participants. For example, “the way Stonehenge looks at sunset” was replaced by “the way Chiang Kai-shek Memorial Hall looks at sunset”. A back-translation was performed by a Chinese-English bilingual student in Psychology and a clinical psychologist in Taiwan. The back-translation was compared to the original version by two native English-speaking psychology PhD students on a 7-pointed Likert-type scale (1 = *totally incorrect*, 7 = *completely correct*). The back-translation was rated a 6 by one person and a 7 by the other on the four measures of the MEPS. Both students rated a 6 for the back translation of the 45 items of rumination/distraction thinking style manipulation.

CHAPTER 3

STUDY 1

THE EFFECT OF RUMINATION/DISTRACTION ON SPS AND AM RETRIEVAL DURING SPS IN DYSPHORIC STUDENTS

3.1 Literature Review

There is well-established evidence that depressed individuals exhibit more deficiencies in SPS than nondepressed individuals (Marx et al., 1992; Goddard et al., 1996). They produce fewer relevant means and generate less effective solutions when asked to solve hypothetical social problems. Depression is also associated with the tendency to retrieve autobiographical events in a more global, categoric format. That is, when deliberately required to retrieve specific memories of events occurring at a particular time and place, depressed individuals produce more categoric memory errors than controls by retrieving categories of events rather than unique instances (e.g., Watkins & Teasdale, 2001). There seems to be a link between these two types of cognitive deficits. That is, the SPS deficit shown by depressed people seems to be associated with enhanced retrieval of overgeneral categoric AMs during the process of SPS (Goddard et al., 1996). Goddard et al. (1996) showed that the quality of AM retrieval during SPS is related to the effectiveness of SPS solutions. In particular the categoric AM retrieval is strongly associated with the ability to generate relevant means as well as to produce effective solutions in depressed people (Goddard et al., 1996).

Recent studies of depression have suggested that a ruminative versus

distractive thinking style might be an underlying mechanism responsible for both AM retrieval deficits (Lyubomirsky et al., 1998) and poor SPS performance (Lyubomirsky & Nolen-Hoeksema, 1995) observed in participants suffering from depression. Rumination is defined as “thoughts and behaviours that focus one’s attention on one’s depressive symptoms and the implications of these depressive symptoms”. Whereas distraction refers to “take one’s mind off one’s low mood and engage in pleasant or neutral activities” (see Nolen-Hoeksema, 1991, pp. 569). With respect to AM retrieval, Lyubomirsky et al. (1998) found that when dysphoric students were induced to ruminate, they came up with negative AMs (e.g., “Everyone passed the test except me”; “My girl cheated on me in Santa Barbara”; “Parents forced me to choose between them after their divorce”) and felt that negative events were more frequent in their lives than positive ones. However, rumination alone, in the absence of dysphoria, was not associated with remembering negative life events (Lyubomirsky et al., 1998).

Watkins et al. (2000) tested whether the cognitive manipulation of rumination could influence AM retrieval in a dysphoric group. In contrast to Lyubomirsky et al. (1998), Watkins et al. (2000) looked at the specificity of the AM retrieved. They found that in a condition where participants were distracted, the number of overgeneral AM retrieval in their responses was significantly reduced. However, in the rumination induction the overgeneral AM retrieval was maintained at a preinduction level.

Rumination has also been linked to SPS. Lyubomirsky and Nolen-Hoeksema (1995) argued that by activating the network of negative memories, ruminative

responses may lead to negatively biased interpretations and pessimistic attributions for events in one's life. This study then showed that rumination might impair problem solving ability among dysphoric people through its negative effect on thinking. For example, the dysphoric ruminators might be more likely to appraise their problems as significant threats to well being, to believe that there are few solutions, to have no confidence about their ability to solve them, or to give them up completely. Lyubomirsky et al. (1999) explored why the dysphoric ruminators are poor problem solvers by examining the association between their mood states and SPS performance on a self-explanatory problem solutions task ² after undergoing the rumination and distraction manipulation. The results showed that dysphoric ruminative thought is characterized by a focus on personal problems combined with a negative tone, self perpetuating for problems as well as reduced self-confidence, optimism, and perceived control (Lyubomirsky et al., 1999). Furthermore they revealed a direct relationship between the negative content of ruminative thoughts and reduced motivation to solve one's problems.

In sum, retrieval of categoric AM while engaging in SPS is associated with poorer SPS performance (Goddard et al., 1996). Moreover, recent studies of depression have suggested that relative to distraction, rumination leads to poorer SPS (e.g., Lyubomirsky et al., 1999) and more categoric AM retrieval (e.g., Watkins et al., 2000). The present study aims to extend previous findings by investigating within the same study if rumination versus distraction has differential effects on both SPS and AM retrieval during SPS. It was expected that

² In this task participants were asked to list three current major problems. They were also being asked to rate how likely they would be able to solve this problem and the severity of the problem on 7-point Likert-type scale. Then they were asked to list the solutions to these problems and rated how confident they were in solving these problems (c.f. Nolen-Hoeksema et al., 1999, pp. 1044).

(1) the dysphoric ruminators will perform more poorly on SPS than the dysphoric distracters, the nondysphoric ruminators and the nondysphoric distracters; (2) the dysphoric ruminators will retrieve more categoric memories during SPS than the dysphoric distracters, the nondysphoric ruminators and the nondysphoric distracters; and (3) the dysphoric group will demonstrate fewer specific AMs and more categoric AMs on the AMT cueing task at the baseline level.

3.2 Method

3.2.1 Design

The design was a 2 (dysphoric status: nondysphoric vs. dysphoric) \times 2 (thinking style: rumination vs. distraction) between subjects design. The number of relevant means and the effectiveness of SPS, as well as the AM retrieved during the SPS served as the dependent measurements.

3.2.2 Participants

The data analysis was based on sixty undergraduate and postgraduate students from the University of St. Andrews. The age range was from 18 years old to 26 years old ($M = 20.87$ years old and $SD = 1.70$ years old, respectively) for the whole sample.

Participants were recruited from the University of St. Andrews by online advertisements and posters around the university campus. Participants received

£ 4 payment for their taking part in after the experiment. Thirty-three participants met the criterion for dysphoria (BDI score equal to 15 or above) and thirty-three participants met the criterion for nondysphoria (BDI score equal to 5 or below). Subsequently three participants were dropped from each group because either (1) they did not adhere to the task instruction, or (2) their initial mood rating was not consistent with their BDI score. Half of the remaining dysphoric (six men and twenty four women) and nondysphoric participants (ten men and twenty women) were randomly assigned to either the rumination or distraction conditions.

3.2.3 Materials

3.2.3.1 Beck Depression Inventory (BDI; Beck et al., 1961)

A description of the BDI (Beck et al., 1961) has been introduced in Section 2.1.1, Chapter 2. It was used in this experiment as an index to allocate participants into either the dysphoric or the nondysphoric group (see Appendix 1). For each item, participants were asked to mark one of four responses that most represented how they had been feeling during the last two weeks. On the basis of past recommendations (Beck, 1967), participants with BDI scores of 15 or above were recruited for the dysphoric group and participants scoring below 5 were recruited for the nondysphoric group.

3.2.3.2 Mood Questionnaires

Participants completed three identical packets of mood questionnaires during

the experiment (see Appendix 2). Each packet contained questionnaires that asked participants to rate their current mood state, on 9-point Likert-type scales (e.g., 1 = *not at all cheerful*; 9 = *extremely cheerful*). Mood questionnaires were first administered at the beginning of the experiment and immediately after the manipulation (i.e., rumination or distraction manipulation). Ratings concerning the current mood were summed to arrive at a single measure of depressed mood at each assessment. The four dimensions of mood ratings were “cheerful” versus “not cheerful”, “sad” versus “not sad”, “unhappy” versus “not unhappy”, and “miserable versus “not miserable”. The mood questionnaire also contained a number of filler scales (e.g., measuring levels of creativity, curiosity, bashfulness, recklessness, etc.) to help disguise the study’s focus on mood.

3.2.3.3 Autobiographical Memory Cueing Task (AMT; Williams & Broadbent, 1986)

In this task, participants are asked to retrieve a specific memory as quickly as possible, in response to each cue word (see Appendix 3). The specific memory was explained to the participants in terms of a past event that happened on a particular day and place. In this experiment, we used the same five positive words (i.e., happy, safe, interested, successful, and surprised) and five negative words (i.e., sorry, angry, clumsy, hurt, and lonely) as used by Evans et al. (1992) and Goddard et al. (1996). Words were presented orally and visually (using an index card) to the participants in the same order listed above, with positive and negative words alternating. Participants were given a maximum of 60 seconds to retrieve a memory to each cue word. If a response was given in that time, a score of 60

seconds was recorded and the next word was given. If the participant gave a general memory, they were prompted to recall a particular time.

3.2.3.4 Thinking Style Manipulation (Rumination versus Distraction)

The rumination/distraction manipulation tasks are designed to influence participants' thinking style by requiring them to focus their attention and "think about" a series of 45 items (Lyubomirsky et al., 1998). This task was adapted by Ed Watkins from the tasks used by Nolen-Hoeksema and Morrow (1993), with items adjusted for British participants (see Appendices 4 & 5). Following Nolen-Hoeksema's (1991) definition of ruminative responses, the ruminative condition instructs participants to focus their attention on thoughts that are emotion focused, symptom focused, and self-focused, although they are not told especially to think about negative emotions and negative personal attributes. For example, participants are asked to think about "your current level of energy", "why your body feels this way", "trying to understand your feelings", "your character and who you strive to be", and "why you turned out this way". In contrast, participants in the distraction condition focus their attention on the thoughts that are externally focused and not related to symptoms, emotions, and the self. For example, they are asked to think about "clouds forming in the sky", "the expression on the face of the Mona Lisa" and "the shiny surface of a trumpet" (see Nolen-Hoeksema, 1991).

In previous work using this rumination/distraction manipulation task, participants spent exactly 8 minutes focusing on the items. In the present study,

the manipulation was administered due to a concern that the effect of the manipulation might fade whilst participants are trying to solve all four problems. Thus one half of the rumination (or distraction) manipulation (23 items) was administered before the first two SPS tasks were presented. The remaining half of the manipulation (22 items) was then administered before the final two SPS tasks were presented. Thus the participants spent 4 minutes on the manipulation in each block. The items were printed on a card, which was handed to the participants one at a time. During each manipulation, participants were instructed to focus their mind on each item and think about each idea.

3.2.3.5 Means-Ends Problem-Solving Procedures (MEPS; Platt & Spivack, 1975a)

The MEPS is a hypothetical SPS task that has been widely used with clinically depressed and dysphoric samples (e.g., Goddard et al., 1996; Watkins & Baracaia, 2002).

The MEPS consists of 10 vignettes that first describe a problem situation and then the resolution of that problem situation (Platt & Spivack, 1975a). Problems revolve around social themes such as experiencing conflict with friends. The following is an example of a MEPS problem:

“You notice that your friends seem to be avoiding you.
You want to have friends and to be liked. The story
ends when your friends like you again. You begin

where you first notice your friends avoiding you.”

Participants are required to describe the actions needed to be taken so that the conclusion may be reached effectively. Platt and Spivack (1975b) showed that it is not necessary to administer all 10 vignettes. In this study four vignettes were used covering the following areas: problem with a teacher, friends avoiding you, moving to a new neighborhood, and dispute with parents (see Appendix 6). An example was presented before beginning the actual experiment to make sure that participants understood the instructions completely. Following each MEPS task, the participants were asked to describe any memories that were retrieved whilst trying to solve each social problem.

Responses were marked on the following three criteria: (1) relevant means (that is, the number of relevant individual steps used to solve the problem [Platt & Spivack, 1975]), (2) effectiveness of the solution, and (3) the number and type of AMs retrieved spontaneously during SPS. The relevant means measure refers to the number of relevant individual steps used to solve the problem. The effectiveness measure is marked on a Likert-type scale ranging from 1 (*not at all effective*) to 7 (*very effective*) for each problem. Scores are summed across the four problems to give each respondent a total effectiveness score and a total means score. Finally two raters categorized the memories spontaneously reported during SPS in terms of their level of specificity (e.g., specific or categoric).

Previous research has demonstrated good inter-rater reliability (.84 for relevant means and .87 for effectiveness) for these two measures on the MEPS

(Goddard et al., 1996).

3.2.4 Procedure

This experiment received ethical approval from the Research Committee in the School of Psychology, University of St. Andrews.

Informed consents were sought from all before starting the experiment. Participants were informed that the study was examining the relationship between the processes of imagination, dreaming, level of consciousness and cognition. This provided a cover story designed to minimize possible demand characteristics. At the beginning of the experiment, participants were given a self-report mood questionnaire to assess their baseline mood state. The questionnaire asked participants to rate their current mood state on four dimensions (sad versus not sad, unhappy versus not unhappy, miserable versus not miserable, cheerful versus not cheerful; the last one was reverse scored) using 9-point Likert-type scales (e.g., 1 = *not at all sad*; 9 = *extremely sad*). The scores on these four dimensions were accumulated to represent their current mood state. A higher score on the mood questionnaire represented a poorer mood.

Then the BDI was administered to obtain a measure of the mood state during the past two weeks (including the day of testing). After completing the BDI, participants were given a word-generating task where they were asked to write down as many words as possible, which begins with an “S”. The purpose of this task was to eliminate the possible negative mood induced by completing the BDI.

A questionnaire about imaging colours, and a questionnaire on dreaming were then given to participants. This questionnaire was included as filler tasks to prevent participants from guessing the purpose of the study or the link between the response manipulation task and SPS tasks.

Next, in the autobiographical memory test, the participants were asked to retrieve a specific memory in response to each 10 (5 positive and 5 negative) emotional cue words, which are orally presented with positive and negative words alternating. The participants' responses were audiotaped and categorized according to the following criteria: specific memory, extended general memory, and categoric general memory. The definition for these memories and how this task was executed are explained in Chapter 2. Participants were given 60 seconds to produce a response. If they failed to produce a response within 60 seconds, the next cue was presented. During the task, prompts were given if the first response was not a specific memory.

Then the first block of either the rumination or the distraction manipulation was then administered. A second self-report mood questionnaire was then administered which was followed by two social problems from the MEPS. Participants were instructed to describe the ideal strategy for solving each of the hypothetical problems. After giving their strategy, participants were asked to report on any memories, which came to mind whilst they were trying to solve the MEPS problems. The second block of either the rumination or the distraction manipulation was then administered and the self-report mood-rating questionnaire was repeated followed by two more MEPS problems. The order of presentation

for the four MEPS problems was randomized across participants.

The MEPS solutions and AMs recalled were scored according to the following criteria. Each MEPS solution was marked for number of relevant means and rated for effectiveness using a 7-point Likert-type scale (1 = *not at all effective*, 7 = *very effective*; cf. Marx et al., 1992). Scores were summed across the four problems. The inter-rater reliability for the means and effectiveness scores on the MEPS were .82 (for means) and .85 (for effectiveness) respectively, based on 22 participants. AMs reported during the MEPS were classified based on criterion used by Williams and Dritschel (1992). A specific memory was defined as a memory for an event that occurred at a particular time and place and lasting less than one day. A categoric memory was defined as a memory for a collection of repeated experiences (e.g., going out with friends on Friday evenings). An extended memory was defined as a memory for an event lasting more than one day. The absence of any memory retrieval during the MEPS was also noted. Two independent raters categorized the memories, one of which was blind to group membership. The inter-rater reliability was found to be .92 using Cohen's κ (Cohen, 1968).

According to previous research, the mood of the dysphoric/depressed individuals becomes worse after receiving the rumination manipulation. To address this ethical consideration, a number of distraction items were given to the dysphoric/depressed ruminators at the end of the experiments involving the rumination manipulation. These distraction items should have eliminated the negative effect on mood caused by the rumination manipulation.

At the end of the experiment, participants were debriefed.

3.3 Results

3.3.1 Manipulation Check

Table 3.1 Mean and SD of Levels of Mood of Each Group (Dysphoric Status × Thinking Style)

	Nondysphoric		Dysphoric	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Mood 1				
M	7.27	6.87	20.20	20.87
(SD)	(2.89)	(2.29)	(3.53)	(3.60)
Mood 2				
M	9.60	6.53	23.27	18.20
(SD)	(4.07)	(2.17)	(4.48)	(4.26)
Mood 3				
M	9.00	6.33	23.33	18.00
(SD)	(3.61)	(1.67)	(3.74)	(4.88)

Mood 1: At the beginning of the experiment
Mood 2: After the first time manipulation
Mood 3: After the second time manipulation

To assess the effects of the rumination versus distraction manipulation, the manipulation check was used reported by Lyubomirsky and Nolen-Hoeksema (1993). Mood change was measured by comparing participants' score on the self-reported mood rating questionnaires. The mood changes were computed for each mood rating score at three different time points: at the beginning of the experiment, after the first time manipulation, and after the second time manipulation (see Table 3.1). A Pearson's correlation was also conducted to examine the association between participants' BDI score and their self-report mood measures and a satisfactory positive correlation was found ($r = .84, p < .01$).

Group differences in the baseline mood were assessed in a 2 (dysphoric status: nondysphoric vs. dysphoric) \times 2 (thinking style: rumination vs. distraction) ANOVA with baseline dysphoria, measured by Likert-type scale ratings, as the dependent variable. There was a main effect of dysphoric status such that dysphoric students had higher levels of dysphoria at the outset of the experiment ($M = 20.53$, $SD = 3.52$) than nondysphoric students ($M = 7.07$, $SD = 2.57$) ($F(1, 56) = 278.59$, $p < .01$). There were no significant differences in baseline dysphoria between the rumination and distraction conditions ($F(1, 56) < 1$, $p > .05$). The interaction between dysphoric status and thinking style was also not significant ($F(1, 56) < 1$, $p > .05$).

A 2 (dysphoric status: nondysphoric vs. dysphoric) \times 2 (thinking style: rumination vs. distraction) ANCOVA (analysis of covariance, with baseline mood as the covariate) was conducted to assess the effects of the rumination or distraction manipulation on post manipulation dysphoria. The results demonstrated a main effect of thinking style ($F(1, 56) = 32.86$, $p < .01$). However, the main effect of dysphoric status was not significant ($F(1, 56) < 1$, $p = .49$). This significant main effect was qualified by a significant interaction of dysphoric status and thinking style ($F(1, 56) = 3.94$, $p = .05$). Simple effect analyses showed that the dysphoric ruminators showed significantly greater dysphoria than the nondysphoric ruminators ($t(28) = 13.67$, $p < .01$), the nondysphoric distracters ($t(28) = 17.73$, $p < .01$), and the dysphoric distracters ($t(28) = 5.07$, $p < .01$).

In case the effects of the rumination or distraction manipulation might not

persist over time, either the rumination or the distraction manipulation was repeated after completing the first two SPS tasks. The results revealed that after the second manipulation, the mood rating (Mood 3) remained very similar to the rating made after the first manipulation (Mood 2) for all four groups (all $t(14) < 1.30, p > .05$).

3.3.2 AM Retrieval on the AMT Cueing Task in Nondysphoric and Dysphoric Groups

Two separate 2 (dysphoric status: nondysphoric vs. dysphoric) \times 2 (thinking style: rumination vs. distraction) ANOVAs were conducted on the numbers of specific and categoric memories retrieved on the AMT cueing task (see Table 3.2).

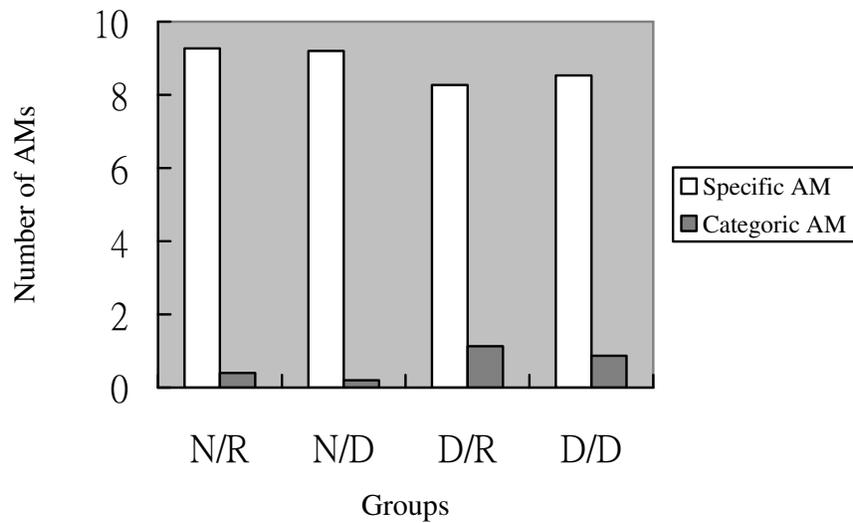
Table 3.2 Total Number of AM Retrieval on the AMT (Dysphoric Status \times Thinking Style)

	Nondysphoric		Dysphoric	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
M	9.27	9.20	8.27	8.53
(SD)	(1.03)	(1.01)	(1.05)	(0.83)
Categoric Memory				
M	0.40	0.20	1.13	0.87
(SD)	(0.63)	(0.41)	(0.99)	(0.74)

The first analysis examined the numbers of specific AMs retrieved on the AMT cueing task. The results revealed that there was a significant main effect of dysphoric status such that the dysphoric participants ($M = 8.4, SD = 0.93$) retrieved significantly fewer specific AMs on the AMT cueing task than the nondysphoric participants ($M = 9.23, SD = 1.01$) ($F(1, 56) = 10.802, p < .001$). However, there was no significant main effect of thinking style ($F(1, 56) = .156, p$

> .05), and no significant dysphoric status × thinking style interaction ($F(1, 56) = .432, p > .05$).

With regard to the number of categoric AMs, there was a main effect of dysphoric status such that the dysphoric participants ($M = 1.00, SD = 0.87$) retrieved significantly more categoric AMs on the AMT cueing task than the nondysphoric participants ($M = 0.30, SD = 0.54$) ($F(1, 56) = 13.968, p < .001$). However, there was no significant main effect of thinking style ($F(1, 56) = 1.552, p > .05$), and no significant dysphoric status × thinking style interaction ($F(1, 56) = .032, p > .05$).



N/R: Nondysphoric Rumination
D/R: Dysphoric Rumination

N/D: Nondysphoric Distraction
D/D: Dysphoric Distraction

Figure 3.1 AM Retrieval on the AMT (Dysphoric Status × Thinking Style)

3.3.3 The Effects of Rumination/Distraction on SPS Performance in terms of Means and Effectiveness

With regard to SPS performance (see Table 3.3), a 2 (dysphoric status: nondysphoric vs. dysphoric) \times 2 (thinking style: rumination vs. distraction) ANOVA was conducted on the total number of relevant means generated on the MEPS between the four groups. The nondysphoric participants ($M = 23.00$, $SD = 4.33$) produced more relevant means than the dysphoric participants ($M = 21.3$, $SD = 2.34$) did ($F(1, 56) = 3.481$, $p = .07$), and this difference was approaching significance. Neither the main effects of thinking style ($F(1, 56) = .001$, $p > .05$), nor the dysphoric status by thinking style interaction ($F(1, 56) = 0.387$, $p > .05$), were significant.

With regard to effectiveness, both the main effect of dysphoric status ($F(1, 56) = 10.7$, $p < .01$) and thinking style ($F(1, 56) = 5.53$, $p < .05$) were significant. However, these main effects were qualified by a significant interaction ($F(1, 56) = 11.38$, $p < .01$). Simple effects analyses showed this effect to be due to the dysphoric ruminators performing significantly less effectively than the dysphoric distracters ($t(28) = 4.59$, $p < .01$), the nondysphoric ruminators ($t(28) = 4.88$, $p < .01$) and the nondysphoric distracters ($t(28) = 4.88$, $p < .01$).

Table 3.3 SPS in terms of Means and Effectiveness (Dysphoric Status \times Thinking Style)

	Nondysphoric		Dysphoric	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Relevant Means				
M	23.27	22.73	21.00	21.60
(SD)	(4.93)	(3.79)	(2.93)	(1.59)
Effectiveness				
M	22.07	21.40	17.73	21.47
(SD)	(3.08)	(2.47)	(1.53)	(2.75)

3.3.4 AM Retrieval during SPS

Two separate 2 (dysphoric status: nondysphoric vs. dysphoric) \times 2 (thinking style: rumination vs. distraction) ANOVAs were conducted on the numbers of specific and categoric AMs retrieved while executing the MEPS task (see Table 3.4).

The first analysis examined the numbers of specific AMs. The results revealed that there was a significant main effect of dysphoric status such that the dysphoric participants ($M = 0.67$, $SD = 0.92$) retrieved significantly less specific memories during SPS than the nondysphoric participants ($M = 1.47$, $SD = 1.04$) ($F(1, 56) = 9.600$, $p < .005$). There was no significant thinking style main effect ($F(1, 56) = 0.067$, $p > .05$) and no significant dysphoric status \times thinking style interaction ($F(1, 56) = 0.067$, $p > .05$).

With regard to the number of categoric AMs, there was also a main effect of dysphoric status such that the dysphoric participants ($M = 1.17$, $SD = 1.39$) retrieved significantly more categoric AMs during the MEPS task than the nondysphoric participants ($M = 0.23$, $SD = 0.43$) ($F(1, 56) = 12.733$, $p < .001$). However, there was no significant thinking style main effect ($F(1, 56) = 1.624$, $p > .05$) and no significant dysphoric status \times thinking style interaction ($F(1, 56) = 2.339$, $p > .05$) were found. In view of the predictions that the dysphoric ruminators would show more categoric AM retrieval than the other three groups, planned-contrast comparisons were conducted to test this hypothesis. The results

showed that the dysphoric ruminators retrieved significantly more categoric AMs than the nondysphoric ruminators ($t(28) = 2.908, p < .05$) and the nondysphoric distracters ($t(28) = 2.747, p < .01$), but not the dysphoric distracters ($t(28) = 1.47, p > .05$).

Table 3.4 AM Retrieved during SPS (Dysphoric Status × Thinking Style)

	Nondysphoric		Dysphoric	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
M	1.47	1.47	0.60	0.73
(SD)	(1.13)	(0.99)	(0.99)	(0.88)
Categoric Memory				
M	0.20	0.27	1.53	0.80
(SD)	(0.41)	(0.46)	(1.73)	(0.86)

3.3.5 Association between SPS and the AM Retrieval during SPS

Firstly, a correlation between SPS performance (in terms of means and effectiveness) and the AM retrieval during SPS were examined in the total sample of sixty participants. A significant positive correlation was found between the MEPS effectiveness score and the specific AM retrieval during SPS ($r = .221, p < .01, 1$ -tailed). There was also a significantly negative correlation between the MEPS effectiveness score and the categoric AM retrieval during SPS ($r = -.401, p < .01, 1$ -tailed). However, there was no significant correlation found between the MEPS means scores and the AM retrieval during SPS.

When examining the association between SPS performance and AM retrieval during SPS, there was a significant negative correlation between the MEPS means score and the number of categoric AMs retrieved during SPS in the dysphoric

distracters, $r = -.531, p < .05$ (1-tailed) (see Table 3.5).

Table 3.5 Correlation between SPS and the AM Retrieval during SPS (Dysphoric Status × Thinking Style)

	Nondysphoric		Dysphoric	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
MEPS Means score	.117	.169	-.074	.122
MEPS Effectiveness score	.217	.006	-.123	.114
Categoric Memory				
MEPS Means score	-.133	-.450	.028	-.530*
MEPS Effectiveness score	-.235	-.227	-.131	-.501

3.4 Discussion

The main aim of this study is to see whether inducing a particular thinking style (rumination versus distraction) prior to SPS would influence (1) the quality of solutions on the SPS task (the MEPS), and (2) types of AMs retrieved during SPS. A further aim was to see if the types of AMs retrieved during SPS related to the quality of solutions produced and if this relationship was mediated by the thinking style manipulation.

It was found that manipulating thinking style prior to SPS had some effects on SPS that were consistent with previous research. On one measure of the MEPS performance, effectiveness, the dysphoric participants who ruminated produced significantly less effective solutions to the MEPS problems than the other three groups. Lyubomirsky and Nolen-Hoeksema (1995) also used a similar rumination versus distraction manipulation with dysphoric and nondysphoric participants prior to the MEPS and found that the dysphoric ruminating participants produced

less effective solutions than the other three groups.

However, on the second measure of the MEPS performance, the number of relevant means, no significant differences were observed although the dysphoric ruminators' mean number of relevant means was fewer than the number for the other three groups. Lyubomirsky and Nolen-Hoeksema (1995) used a related but different second measure of the MEPS performance, the percentage of model solutions, to increase the objectiveness of the ratings of problem-solving performance. They initially presented the interpersonal problem situations to 8 independent judges and instructed them to list the steps or solutions involved in what they believed to be a "model" response to each situation. Thus, for each situation, there was a set of model solutions. For example, the model solutions for the situation involving a friend's avoiding included: (1) going to see the friend in person, (2) approaching the issue in a tactful way, and (3) saying something to reaffirm the friendship. Lyubomirsky and Nolen-Hoeksema (1995) calculated the percentage of all solutions offered by participants that were model solutions, and found that the dysphoric-ruminating students performed more poorly than the other three groups. In the present study, the number of relevant means was employed as this measure was used in other works (e.g., Marx et al., 1992; Goddard et al., 1996) on SPS in depression. Consistent with Marx et al.'s findings, Goddard et al. found that depressed respondents performed more poorly on the MEPS, generating solutions that were less effective and contained fewer relevant means. Future work needs to be done by measuring the percentage of model solutions to examine the performance in dysphoric and nondysphoric participants respectively to see if this measure is more sensitive to a rumination manipulation.

For the AM retrieved during SPS, it was hypothesized that there would be an interaction between thinking style manipulation and depressed status on the types of AMs retrieved during SPS. Specifically it was predicted that the dysphoric ruminating participants would retrieve significantly fewer specific AMs during SPS and significantly more categoric AMs than the other three groups. Some of the predictions were confirmed. The dysphoric ruminators did retrieve significantly more categoric AMs compared to the nondysphoric ruminators and nondysphoric distracters. Moreover, the dysphoric ruminators retrieved more categoric AMs than the dysphoric distracters, although this difference was not significant. This lack of significance is not consistent with Watkins et al. (2000) who found that in a clinical depressed sample, distraction significantly reduced overgeneral categoric AMs, whereas the rumination induction maintained overgeneral categoric AMs at a preinduction level.

Methodological factors may account for the failure to replicate the effects of rumination on the AM retrieval during SPS. Unlike the present study, Watkins et al. (2000) used clinical depressed patients where the rumination manipulation was likely to have stronger effects on their memory processes. It could also be that in previous work using this thinking style manipulation task, participants spent exactly 8 minutes focusing on the items (e.g., Lyubomirsky et al., 1998). In the present study, the manipulation was administered in two blocks due to concerns that the effect of the manipulation might be faded out whilst participants are trying to solve all four SPS problems. Thus the participants spent 4 minutes on half of the thinking style manipulation in each block. Although the manipulation checks

indicated that the manipulation was effective in producing mood changes between the groups, the levels of dysphoria reported by the dysphoric distraction group did not reach those of the nondysphoric group. This suggested more power is needed to pick up differences.

Finally, Watkins et al. (2000) also used a direct memory task, the AMT cueing task, whereas the present study employed an indirect memory task, spontaneous memory retrieval during SPS. As it has been indicated in the previous study (Goddard et al., 1998) that distinct cognitive loads are involved in these two different memory tasks. Moreover, the potential memory cues inherent in the MEPS are much richer than the single-word cues of the memory cueing technique. Furthermore, on the AMT cueing task, participants are directed in terms of the quality of memories they are required to retrieve (i.e., specific AMs) during SPS, retrieval is spontaneous and not an explicit task requirement. Therefore, the ability to retrieve specific AMs, as measured by the AMT cueing task, does not necessarily imply that respondents should retrieve this type of memory during SPS, on which no retrieval instruction is administered.

A further aim was to see if there was a relationship between SPS performance and types of AMs retrieved during SPS. Only one significant correlation was found such that the dysphoric distracters their categoric AMs was negatively correlated with their MEPS means scores. Moreover, the results demonstrated an interesting pattern. Previous research (Goddard et al., 1996) showed that specific AM retrieval during SPS was associated with better SPS performance and categoric AM retrieval was associated with poorer SPS performance. This pattern

was observed for the distraction samples (both dysphoric and nondysphoric) but not for the rumination samples in the present study. In fact for the dysphoric ruminators greater specific AM retrieval was associated with poorer MEPS performance.

Another reason might be that it is better to manipulate participants' cognitive style when they are thinking about an interpersonal problem. Watkins and Baracaia (2002) tested the hypothesis that impaired SPS in depression is a consequence of state-oriented rumination, which can be ameliorated by improving awareness of mental processes. They found that the process-focused questions significantly improved SPS in depressed patients, compared to no-questions and state-oriented questions, which did not differ from each other. These results were consistent with recent theories (Teasdale et al., 1995) and treatment developments (Mindfulness-based Cognitive Therapy; MBCT, Teasdale et al., 2000), which suggested that increased awareness of mental processes could shift people away from ruminative thinking, thereby, reducing depression relapse. Here are some examples of the processed-focused questions: "How am I deciding on a way to solve this problem?" "What am I thinking about in terms of starting to solve this problem?" Given that these samples are encouraging the participants to think about the possible solutions to the specific problem, which in turn helps the participants to generate more relevant means and effective solutions. This strategy might work better than the distraction manipulation, which is designed to enhance the mood but not directly improving the mental awareness.

The AMT cueing task was also included in the present study to see if the

dysphoric participants would show more deficient AM retrieval than the nondysphoric participants at the baseline level of the AM specificity. Consistent with previous findings (e.g., Marx et al., 1992; Goddard et al., 1996), dysphoric participants performed more poorly than nondysphoric participants on the AMT cueing task; dysphoric participants offered more inappropriate categoric AMs and retrieved fewer specific AMs than nondysphoric participants.

In conclusion, the results suggest that in a dysphoric sample rumination impairs both SPS performance and AM retrieval during SPS, although the effect is less robust for AM retrieval during SPS. One implication of these results is that rumination may not only affect SPS through increased retrieval of categoric AMs but may also influence negative mood and therefore affect other processes like the spontaneous initiation of useful strategies and motivation (e.g., Hertel & Hardin, 1990). In the present study, a correlational design has been adopted to clarify the relationship between SPS performance and AM retrieval during SPS. More in-depth analysis is now required to examine the causal relationship between rumination and poor SPS performance.

CHAPTER 4

STUDY 2

THE EFFECT OF RUMINATION/DISTRACTION ON SPS AND AM RETRIEVAL DURING SPS IN CLINICAL DEPRESSION

4.1 Literature Review

As was reviewed in Chapter 3, there is some evidence that rumination interacts with depressed mood to influence SPS performance (Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Baracaia, 2002) as well as AM retrieval (Lyubomirsky et al., 1998; Watkins et al., 2000). However there is only one study (Kao, Dritschel, & Astell, 2006), Study 1 in this thesis (see Chapter 3), which examined how rumination interacts with depression to influence both SPS performance and AM retrieval during SPS. Study 1 using dysphoric participants, replicated previous findings (Goddard et al., 1996; Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Baracaia, 2002) concerning SPS performance but not AM retrieval during SPS. In terms of SPS, an interaction was found between dysphoric status and thinking style such that the dysphoric ruminators produced significantly less effective solutions on the MEPS than the dysphoric distracters, the nondysphoric ruminators and the nondysphoric distracters. With respect to AM retrieval during SPS, the dysphoric ruminators did not differ from the dysphoric distracters on the numbers of categoric AMs retrieved during SPS although they retrieved significantly more categoric AMs than the nondysphoric distracters as well as the nondysphoric ruminators. No interaction between

dysphoric status and thinking style was observed for both specific and categoric AM retrievals during SPS. When the association between SPS performance and AM retrieval during SPS was examined in the total sample of sixty participants, only one SPS performance measure, the MEPS effectiveness score, was significantly negatively correlated with categoric AMs retrieved during SPS; and significantly positively correlated with specific AMs retrieved during SPS.

This lack of a significant of rumination on AM retrieval during SPS is not consistent with previous studies by Watkins et al. (2000) as well as Watkins and Teasdale (2001), who found that in a clinically depressed group, distraction significantly reduced the retrieval of overgeneral categoric AM, whereas the rumination induction maintained the retrieval of overgeneral categoric AM at a preinduction level. There are a number of possible reasons for this failure to replicate. Watkins et al. used a direct memory task, the AMT cueing task, whereas Study 1 employed an indirect memory task, spontaneous AM retrieval during SPS. There is evidence from a dual task paradigm that the processing demands associated with the two types of AM retrieval task are different (Goddard et al., 1998). Another difference between the two studies (i.e., the present study and Watkins et al.) is that Watkins et al. examined a clinically depressed sample whereas Study 1 used a dysphoric sample. It is possible that rumination may have stronger effects on memory processes in a clinical depressed sample.

It appears that no previous study has directly compared the effects of ruminative thinking on cognitive processing between the dysphoric and the clinically depressed participants within a single study. However, the differential

activation hypothesis (Teasdale, 1988) provides some evidence that dysphoric and depressed individuals might be significantly distinctive from each other in their cognitive processing such as the type of negative thinking pattern manifested. Teasdale suggested that there is an association between negative thinking and depressed mood. This association is maintained through a reciprocal loop such that negative mood leads to negative thinking and vice versa. The severity of depression is determined by the type of negative thinking pattern that an individual has. Thus it is reasonable to assume that the negative thinking patterns may be manifested to different degrees and styles such that the depressed individuals may make more global negative attributions and have a more negative self-referent style than dysphoric individuals do. This dysfunctional thinking pattern can be activated and strengthened by repeatedly occurring negative events, which have a detrimental influence on the mood. Therefore, this detrimental process becomes more and more autonomous with the increasing episodes of depression (Lau & McMain, 2005; Lau, Segal, & Williams, 2004; Williams, Barnhofer, Crane, and Beck, 2005). One possibility, therefore, is that in dysphoria, rumination may affect SPS by influencing negative mood and therefore affecting other processes like the spontaneous initiation of useful strategies and motivation (e.g., Hertel & Hardin, 1990). However, in a clinically depressed sample, a different pattern might occur whereby rumination may affect SPS by increasing categoric AM retrieval during SPS and reducing specific AM retrieval. This enhanced categoric AM retrieval would in turn perpetuate SPS performance. Study 2 was therefore designed to assess this question. The AMT cueing task will again be used to establish a baseline measure of AM as a function of depression.

The specific predictions are that compared to a nondepressed group, (1) the depressed people will retrieve more categoric AMs on the AMT cueing task, (2) the depressed ruminators will have poorer SPS performance in terms of the relevant means and effectiveness than the depressed distracters, the nondepressed ruminators and nondepressed distracters, (3) the depressed ruminators will retrieve more categoric AMs during SPS and less specific AMs during SPS than the other three groups.

4.2 Method

4.2.1 Design

The design was a 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) between subjects design. The number of relevant means and the effectiveness in SPS, as well as AM retrieval during SPS served as the dependent measurements.

4.2.2 Participants

The clinically depressed group was recruited from either the Affective Disorder Clinic in Ninewells hospital or from the Health Centre in St. Andrews. Thirty clinically depressed patients who meet the criteria of Major Depressive Disorder according to DSM-IV were referred by the psychiatrists and doctors to take part in the experiment. Patients whose depression was due to organic factors, e.g., brain damage, and patients with any previous psychotic symptoms were

excluded from the experiment. The patients who were diagnosed with manic-depressive disorder were also excluded as previous research has indicated that they have different cognitive profile from the Major Depressive Disorder patients (Ridout, 2004). Patients with any previous psychotic symptoms will be excluded from experiments as well. They were tested individually in an interview room in the hospital or within the School of Psychology, University of St. Andrews. Thirty healthy controls were recruited via the advertisement around St. Andrews area. They were interviewed by the experimenter by using the SCID to make sure that they were not meeting the diagnostic criteria of Major Depressive Disorder. Participants received a £4 payment for their taking part in after the experiment. Their background information can be seen in the Section 4.2.2.1 to 4.2.2.3 (Table 4.1 to Table 4.3).

4.2.2.1 Age

Table 4.1 Mean Years of Age

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
M	37.33	41.33	38.00	40.93
(SD)	(9.52)	(7.31)	(7.99)	(6.75)

A 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVA on age was conducted to determine if the groups differed in age. There were no significant main effects for either depressed status ($F(1, 56) = 0.03, p > .05$) or thinking style ($F(1, 56) = 2.40, p > .05$). The interaction between depressed status and thinking style was not significant ($F(1, 56) = 0.14, p > .05$) (see Table 4.1).

4.2.2.2 Years of Education

Table 4.2 Years of Education

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
M (SD)	12.07 (3.31)	10.67 (3.81)	11.00 (2.78)	10.93 (5.02)

A 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVA was conducted to determine if the groups differed in mean years of education. There were no significant main effects for either depressed status ($F(1, 56) = 0.16, p > .05$) or thinking style ($F(1, 56) = 0.55, p > .05$). The interaction between depressed status and thinking style was not significant ($F(1, 56) = 0.46, p > .05$) (see Table 4.2).

4.2.2.3 BDI Scores

Table 4.3 BDI Score

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
M (SD)	2.33 (1.18)	2.73 (1.58)	30.33 (4.27)	30.80 (4.20)

A 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVA was conducted to determine if the groups differed in BDI scores. Only a significant depressed status main effect was found ($F(1, 56) = 1187.282, p < .001$). Neither a main effect for thinking style ($F(1, 56) = 0.284, p > .05$) nor an interaction effect between depressed status and thinking style ($F(1, 56) = 0.002, p > .05$) was found (see Table 4.3).

4.2.3 Materials

4.2.3.1 Beck Depression Inventory (BDI; Beck et al., 1961)

The characters of the BDI (Beck et al., 1961) have been introduced in Chapter 2. It was used in this experiment as an index to represent the participants' recent mood state because of its well-approved psychometric characteristics (Beck, Steer, & Garbin, 1988). For each item, participants were asked to mark one of four responses that most represented how they had been feeling during the last two weeks (see Appendix 1).

4.2.3.2 Mood Questionnaires

Participants completed three identical packets of mood questionnaires during the experiment (see Appendix 2). Each packet contained questionnaires that asked participants to rate their current mood state, on 9-point Likert-type scales (e.g., 1 = *not at all cheerful*; 9 = *extremely cheerful*). Mood questionnaires were first administered at the beginning of the experiment and immediately after the response-manipulation (i.e., rumination or distraction manipulation). Ratings concerning the current mood were summed to arrive at a single measure of depressed mood at each assessment. The four dimensions of mood ratings were cheerful/not cheerful (reverse scored), sad/not sad, unhappy/not unhappy, and miserable/not miserable. The mood questionnaire also contained a number of filler scales (e.g., measuring levels of creativity, curiosity, bashfulness, recklessness,

etc.) to help disguise the study's focus on mood.

4.2.3.3 Autobiographical Memory Cueing Task (AMT; Williams & Broadbent, 1986)

In this task, participants were asked to retrieve a specific memory, as quickly as possible, in response to each cue word (see Appendix 3). The specific memory was explained to the participants in terms of a past event that happened on a particular day and place. In this experiment, we used the same five positive words (i.e., happy, safe, interested, successful, and surprised) and five negative words (i.e., sorry, angry, clumsy, hurt, and lonely) as used by Evans et al. (1992) and Goddard et al. (1996). Words were presented to the participants orally and visually (using an index card) in the same order listed above, with positive and negative words alternating. Participants were given a maximum of 60 seconds to retrieve a memory to each cue word. If no response was given in that time, a score of 60 seconds was recorded and the next word was given. If the participant gave a general memory, they were prompted to recall a particular time.

4.2.3.4 Thinking Style Manipulation (Rumination versus Distraction)

The original response-manipulation tasks were designed to influence the content of participants' thoughts by requiring them to focus their attention and "think about" a series of 45 items (Lyubomirsky et al., 1998). This task was adapted by Watkins (2000) from the tasks used by Nolen-Hoeksema and Morrow (1993), with items adjusted for British participants (see Appendices 4 & 5).

Following Nolen-Hoeksema's (1991) definition of ruminative responses, the ruminative condition instructs participants to focus their attention on thoughts that are emotion focused, symptom focused, and self-focused, although they are not told especially to think about negative emotions and negative personal attributes. For example, participants are asked to think about "your current level of energy", "why your body feels this way", "trying to understand your feelings", "your character and who you strive to be", and "why you turned out this way". In contrast, participants in the distraction condition focus their attention on the thoughts that are externally focused and not related to symptoms, emotions, and the self. For example, they are asked to think about "clouds forming in the sky", "the expression on the face of the Mona Lisa," and "the shiny surface of a trumpet."

In previous work using this response-manipulation task, participants spent exactly 8 minutes focusing on the items. In our current study, we decided to administer the manipulation in two blocks because we were concerned that the effect of the manipulation might fade whilst participants are trying to solve all four problems. Thus one half of the rumination/distraction manipulation (23 items) was administered before the first two SPS tasks were presented. The remaining half of the thinking style manipulation task (22 items) was then administered before the final two SPS tasks were presented. Thus the participants spent 4 minutes on the thinking style manipulation task in each block. The items were printed each on a single card, which was handed to the participants one at a time. During each manipulation, participants were instructed to focus their mind on each item and think about each idea.

4.2.3.5 Means-Ends Problem-Solving Procedures (MEPS; Platt & Spivack, 1975a)

In this study, four MEPS tasks were used to assess participants' social problem solving ability (see Appendix 6). The MEPS is a hypothetical SPS task and consists of 10 vignettes that first describe a problem situation and then the resolution of that problem situation. Problems revolve around social themes such as:

“You notice that your friends seem to be avoiding you. You want to have friends and to be liked. The story ends when your friends like you again. You begin where you first notice your friends avoiding you.”

Respondents are required to describe the actions needed to be taken so that the conclusion may be reached effectively. Platt and Spivack (1975b) showed that it is not necessary to administer all 10 vignettes. In this study we used four vignettes that covered the following areas: problem with a boss/teacher, falling out with friends, moving to a new neighborhood, and dispute with partner/parents. An example was presented before beginning the actual experiment to make sure that participants understood the instructions completely. Following each MEPS task, the participants were asked to write down any thoughts or images that crossed their mind whilst trying to solve this social problem.

Responses were marked for relevant means according to the criteria determined by Platt and Spivack (1975) and for effectiveness according to the rating used by Marx et al. (1992). The effectiveness measure was marked on a Likert-type scale ranging from 1 (*not at all effective*) to 7 (*very effective*) for each problem. Scores were summed across the four problems to give each respondent a total effectiveness score and a means score.

4.2.4 Procedure

This experiment received ethical approval from the Tayside Committee on Medical Research Ethics and extended to Fife area by Fife NHS Board, Local Research Ethics Committee.

The participants were tested individually either in an interview room in the Ninewells Hospital or in the School of Psychology, University of St. Andrews.

Informed consents were sought from all before starting the experiment. Participants were informed that the study was examining the relationship between the processes of imagination, dreaming, levels of consciousness and cognition. This provided a cover story designed to minimize possible demand characteristics.

In the beginning, the participants were given the first self-report mood questionnaire to assess their baseline mood state. Then, the BDI was used to obtain their mood states. A word-generating task was administered immediately after the BDI, which required participants to write down as many words as

possible that began with an “S” in 90 seconds. This task was designed to eliminate any ruminating effect, which might be brought by completing the BDI.

A questionnaire about imaging colors, and a questionnaire on dreaming were then given to the participants. These two questionnaires were included as filler tasks to prevent participants from guessing the purpose of the study or the link between the thinking style manipulation task and SPS tasks.

In the AMT cueing task, the participants were asked to retrieve a specific memory in response to each 10 (5 positive and 5 negative) emotional cue words, which are orally and visually presented with positive and negative words alternating. The participants’ responses were audiotaped and categorized according to the following criteria: specific memory, extended general memory, and categoric general memory. The definitions for these memories are explained in Section 2.3.1, Chapter 2. In the rumination/distraction manipulation, participants in the rumination condition focused their attention on items that are symptom-focused, emotion-focused, and self-focused, whereas in the distraction condition, they focused their attention on the items that are externally focused. Thus, in each condition, participants first concentrated on 23 items for 4 minutes. Following the manipulation, the participants completed a self-report measure of mood. Then, two hypothetical social problems selected from the MEPS and their happy endings were presented to the participants. The participants were asked to list the steps that were required to reach the happy ending to the hypothetical social-problems. Next the participants concentrated on the remaining 22 items in the response-manipulation task for four minutes before solving two further social

problems from the MEPS. The order of presentation for the four MEPS problems was random. The inter-rater reliability for the means and effectiveness scores on the MEPS were .86 (for means) and .81 (for effectiveness) respectively, based on 15 participants.

After responding to each social problem, the participants were asked to write down any thoughts or images that crossed their mind whilst trying to solving the social problems. Their responses were categorized according to the following criteria: specific memory, extended general memory, categoric general memory, and general knowledge concerning the problem. As a manipulation check for the thinking style manipulation, participants were asked to fill in a debriefing questionnaire administered at the end of the study to recall the instructions to this task and to describe what they exactly did during this task.

According to previous research, the mood of the dysphoric/depressed individuals becomes worse after receiving the rumination manipulation. To address this ethical consideration, a number of distraction items were given to the dysphoric/depressed ruminators at the end of the experiments involving the rumination manipulation. These distraction items should have eliminated the negative effect on mood caused by the rumination manipulation.

The whole test session took less than one hour.

4.3 Results

4.3.1 Manipulation Check

As can be seen in Table 4.4, at the beginning of the study, participants in the depressed group reported greater depressed mood than participants in the nondepressed group. A Pearson's correlation was conducted to examine the association between participants' BDI score and their self-report mood measure and a satisfactory positive correlation was found ($r = 0.68, p < 0.01$). Baseline mean levels of depressed mood of each group were as follows: nondepressed rumination group, 9.80 ($SD = 3.00$); nondepressed distraction group, 9.27 ($SD = 1.91$); depressed rumination group, 26.27 ($SD = 2.28$); depressed distraction group, 27.87 ($SD = 2.90$).

Group differences in baseline mood were assessed in a 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA with baseline mood rating measured by Likert-type scale ratings, as the dependent variable. There was a main effect of depressed status such that depressed participants had higher levels of depressed mood at the outset of the experiment ($M = 27.07, SD = 2.69$) than nondepressed participants ($M = 9.53, SD = 2.49$) ($F(1, 56) = 701.714, p < .001$). There were no differences in baseline depressed mood rating between rumination and distraction thinking style conditions ($F(1, 56) = 0.649, p > .05$). The interaction between depressed status and thinking style condition was also not significant ($F(1, 56) = 2.597, p > .05$) (see Table 4.4).

Table 4.4 Mean and SD of Levels of Mood of Each Group (Depressed Status × Thinking Style)

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Mood 1				
M	9.80	9.27	26.27	27.87
(SD)	(3.00)	(1.97)	(2.28)	(2.90)
Mood 2				
M	9.73	8.93	28.60	19.87
(SD)	(2.96)	(1.79)	(3.20)	(3.50)
Mood 3				
M	9.53	8.80	29.00	19.40
(SD)	(2.95)	(1.97)	(3.84)	(3.50)

Mood 1: At the beginning of the experiment

Mood 2: After the first time manipulation

Mood 3: After the second time manipulation

Mean levels of mood rating after the first time rumination/distraction manipulation were as follows: nondepressed rumination group, 9.73 ($SD = 2.96$); nondepressed distraction group, 8.93 ($SD = 1.79$); depressed rumination group, 28.60 ($SD = 3.20$); depressed distraction group, 19.87 ($SD = 3.50$). A 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANCOVA (analysis of covariance, with baseline mood as the covariance) was conducted to assess the effects of the rumination/distraction manipulation on post manipulation depressed mood. The results of ANCOVA demonstrated a main effect of rumination/distraction thinking style manipulation ($F(1, 56) = 65.845, p < .001$). The depressed status × thinking style interaction ($F(1, 56) = 52.962, p < .001$), explained group differences in terms of mood 2 of the participants in the depressed rumination group were significantly worse than mood 2 of the participants in the depressed distraction group ($t(28) = 7.127, p < .001$). The depressed ruminators also demonstrated worse mood than the nondepressed

ruminators ($t(28) = 16.747, p < .001$) and nondepressed distracters ($t(28) = 20.756, p < .001$) (see Table 4.4).

To address concerns that the effect of the rumination/distraction manipulation might not persist over time, the manipulation was repeated once the first two social problem-solving tasks were completed. Then the participants were asked to complete the self-report measure of mood again. The results of paired samples t tests revealed that after the second rumination/distraction manipulation, the mood rating (Mood 3) remained very similar to the rating made after the first response manipulation (Mood 2) for all four groups in the study (all $t(14) < 0.50, p > .05$) (see Table 4.4).

4.3.2 AM Retrieval on the AMT Cueing Task in the Nondepressed and Depressed Groups

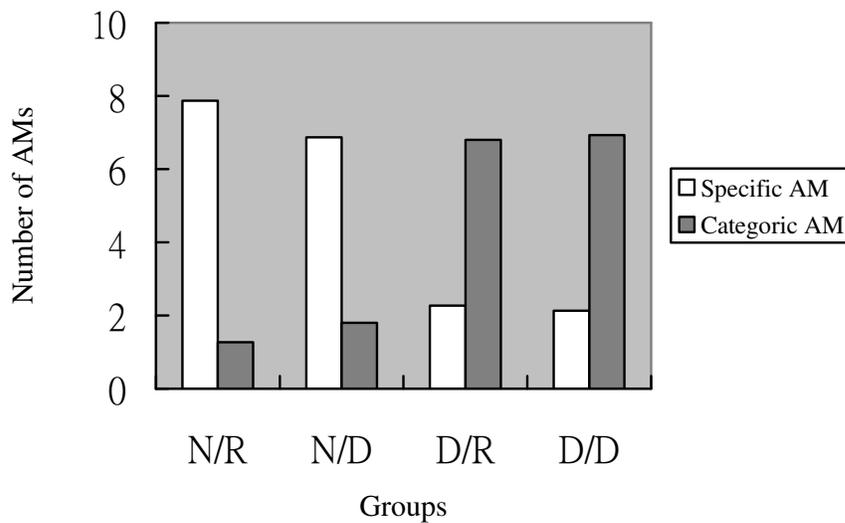
Table 4.5 Total number and SD of AM Retrieved on the AMT (Depressed Status \times Thinking Style)

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
M	7.87	6.87	2.27	2.13
(SD)	(1.18)	(1.40)	(0.88)	(1.18)
Categoric Memory				
M	1.27	1.80	6.80	6.93
(SD)	(0.88)	(0.94)	(1.61)	(1.75)

Two separate 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVAs were conducted on the numbers of specific AMs and categoric AMs retrieved on the AMT cueing task.

The first analysis examined the numbers of specific AMs. The results revealed that there was a significant main effect of depressed status such that the depressed participants retrieved significantly fewer specific AMs on the AMT cueing task than the nondepressed participants ($F(1, 56) = 286.988, p < .001$) (nondepressed participants, $M = 7.37, SD = 1.38$; depressed participants, $M = 2.20, SD = 1.03$). However, there was neither a significant main effect of thinking style ($F(1, 56) = 3.452, p > .05$), nor significant depressed status \times thinking style interaction ($F(1, 56) = 2.019, p > .05$) (see Figure 4.1).

For the number of categoric AMs, there was a main effect of depressed status such that the depressed participants retrieved significantly more categoric AMs on the AMT cueing task than the nondepressed participants ($F(1, 56) = 232.727, p < .001$) (nondepressed participants, $M = 1.53, SD = 0.94$; depressed participants, $M = 6.87, SD = 1.66$). But, there was neither a significant thinking style main effect ($F(1, 56) = 0.909, p > .05$), nor significant depressed status \times thinking style interaction ($F(1, 56) = 0.327, p > .05$) (see Figure 4.1).



N/R: Nondysphoric Rumination
D/R: Dysphoric Rumination

N/D: Nondysphoric Distraction
D/D: Dysphoric Distraction

Figure 4.1 AM Retrieval on the AMT (Dysphoric Status × Thinking Style)

4.3.3 The Effects of Rumination/Distraction on SPS Performance in terms of Means and Effectiveness

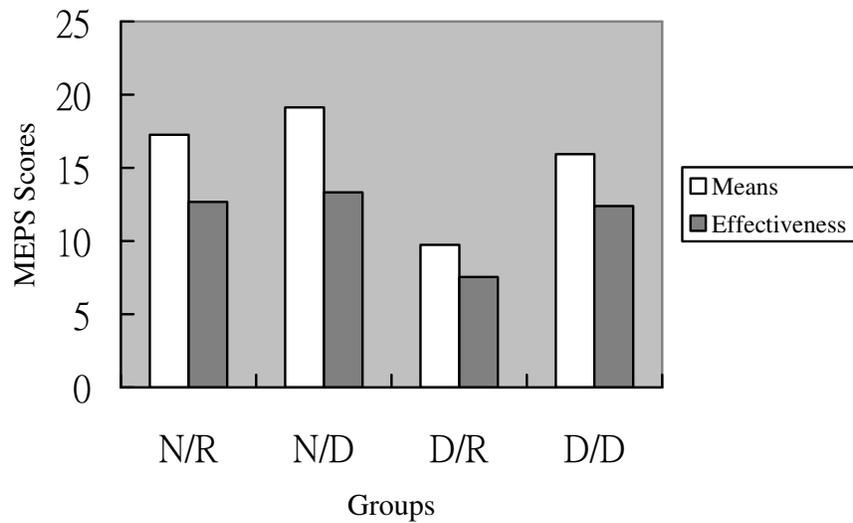
Table 4.6 SPS in terms of Means and Effectiveness (Depressed Status × Thinking Style)

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Means				
M	17.27	19.13	9.73	15.93
(SD)	(3.03)	(3.96)	(2.02)	(3.53)
Effectiveness				
M	12.67	13.33	7.53	12.40
(SD)	(2.92)	(3.33)	(1.85)	(3.50)

As can be seen in Table 4.6, the depressed ruminators produced fewer relevant means ($M = 9.73$, $SD = 2.02$) as well as less effective solutions ($M = 7.53$, $SD = 1.85$) than the other groups. Two 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVAs were then calculated to

examine the effects of rumination/distraction on SPS performance (MEPS means scores and MEPS effectiveness scores). For the MEPS means score, there was a significant main effect of depressed status ($F(1, 56) = 41.674, p < .001$) and a significant main effect of thinking style ($F(1, 56) = 23.539, p < .01$). There was also a significant depressed status \times thinking style interaction ($F(1,56) = 6.793, p < .05$), which explained group differences in terms of the MEPS means score of the participants in the depressed rumination group were significantly lower than the participants in the depressed distraction group, nondepressed rumination and nondepressed distraction group ($t(28) = -5.900; t(28) = 8.007; t(28) = 8.190$, all $p < .001$) (see Figure 4.2).

For the MEPS effectiveness score, there was a significant main effect of depressed status ($F(1, 56) = 15.646, p < .001$) and a main effect of thinking style ($F(1, 56) = 13.016, p < .01$). Also an depressed status \times thinking style interaction effect was observed ($F(1, 56) = 7.499, p < .01$), which explained group differences in terms of the MEPS effectiveness score of the participants in depressed rumination group were significantly lower than the participants in depressed distraction group, nondepressed rumination and nondepressed distraction group ($t(28) = -4.762; t(28) = 5.755; t(28) = 5.898$, all $p < .001$) (see Figure 4.2).



N/R:

Nondysphoric Rumination N/D: Nondysphoric Distraction
D/R: Dysphoric Rumination D/D: Dysphoric Distraction

Figure 4.2 SPS in terms of Means and Effectiveness (Dysphoric Status × Thinking Style)

4.3.4 The Effects of Rumination/Distracton on AM Retrieval during SPS

Two separate 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVAs were conducted on the numbers of specific and categoric AMs retrieved while executing the MEPS task.

The first analysis examined the numbers of specific AMs retrieved. The results revealed that there was a significant main effect of depressed status such that the depressed participants retrieved significantly fewer specific AMs during the MEPS task than the nondepressed participants ($F(1, 56) = 12.106, p < .001$) (nondepressed participants, $M = 2.13, SD = 0.94$; depressed participants, $M = 1.43, SD = 0.68$) (see Figure 4.3). There was also a significant main effect of thinking style ($F(1, 56) = 7.933, p < .05$), such that the ruminators ($M = 1.50, SD = 0.78$)

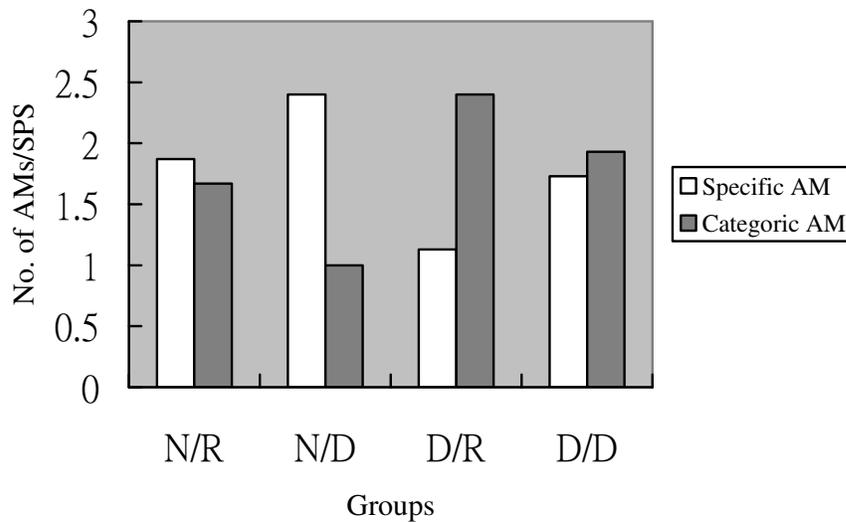
retrieved significantly fewer specific AMs during the MEPS task than the distracters ($M = 2.07$, $SD = 0.91$). There was no significant depressed status \times thinking style interaction ($F(1, 56) = 0.027$, $p > .05$). However, in view of the hypotheses, the planned contrast comparisons were conducted. Moreover, in the depressed group, the participants who received the rumination manipulation retrieved significantly fewer specific AMs than those who received the distraction manipulation ($t(28) = -2.662$, $p < .05$), as well as fewer than the nondepressed ruminators ($t(28) = 2.896$, $p < .01$) and the nondepressed distraction group ($t(28) = 3.974$, $p < .001$).

For the number of categoric AMs retrieved, there was also a main effect of depressed status such that the depressed participants retrieved significantly more categoric AMs during the MEPS task than the nondepressed participants (nondepressed participants, $M = 1.33$, $SD = 1.03$; depressed participants, $M = 2.17$, $SD = 0.83$) ($F(1, 56) = 12.718$, $p < .001$) (see Figure 4.3). There was also a significant main effect of thinking style ($F(1, 56) = 5.881$, $p < .05$) where the ruminators ($M = 2.03$, $SD = 0.93$) retrieved significantly more categoric AMs during the MEPS task than the distracters ($M = 1.47$, $SD = 1.04$). However, there was no significant depressed status \times thinking style interaction ($F(1, 56) = 0.183$, $p > .05$). In view of the hypotheses, the planned contrast comparisons were conducted. In the depressed group, there was no significant difference between the ruminators and distracters in their categoric AM retrieval during SPS ($t(28) = 1.571$, $p > .05$). However, the depressed rumination group did retrieve more categoric AMs during SPS than the nondepressed rumination group ($t(28) = -2.323$, $p < .05$) and the nondepressed distraction group ($t(28) = -3.729$, $p < .01$)

(see Figure 4.3).

Table 4.7 Number of AM retrieval during SPS (Depressed Status × Thinking Style)

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
M	1.87	2.40	1.13	1.73
(SD)	(0.74)	(1.06)	(0.64)	(0.59)
Categoric Memory				
M	1.67	1.00	2.40	1.93
(SD)	(0.82)	(1.13)	(0.91)	(0.71)



N/R: Nondysphoric Rumination
D/R: Dysphoric Rumination

N/D: Nondysphoric Distraction
D/D: Dysphoric Distraction

Figure 4.3 AM Retrieved during SPS (Dysphoric Status × Thinking Style)

4.3.5 Association between SPS Performance and AM Retrieval during SPS

Firstly, a correlation between MEPS performance (in terms of means and

effectiveness) and the AM retrieval during SPS were examined in the total sample of 60 participants. A significant positive correlation between the specific AM retrieval during SPS and SPS performance was found ($r = .649, p < .01$ for MEPS means score; $r = .518, p < .01$ for MEPS effectiveness score). There was also a significant negative correlation between the categoric AM retrieval during SPS and SPS performance ($r = -.478, p < .01$ for MEPS means score; $r = -.429, p < .01$ for MEPS effectiveness score).

When the association between MEPS performance and AM retrieval during SPS was examined within groups, first of all there was a significant positive correlation between the MEPS effectiveness scores and specific AM retrieval ($r = .472, p < .05, 1$ -tailed); as well as a negative correlation approaching significant between MEPS effectiveness scores and categoric AM retrieval in the nondepressed ruminators ($r = -.439, p > .05, 1$ -tailed). Also a significant positive correlation was found between the MEPS means scores and specific AM retrieval in nondepressed distracters ($r = .550, p < .05, 1$ -tailed) (see Table 4.8). For the depressed ruminators, a significant positive correlation between the MEPS means scores and specific AM retrieval ($r = .694, p < .01, 1$ -tailed) was found; as well as a significant negative correlation between categoric AM retrieval and the MEPS means score ($r = -.599, p < .01, 1$ -tailed) as well as the MEPS effectiveness score ($r = -.518, p < .05, 1$ -tailed) were also observed. For the depressed distracters, the significant positive correlations were found between their MEPS means scores and specific AM retrieval ($r = .536, p < .05, 1$ -tailed), and their MEPS effectiveness scores ($r = .639, p < .01, 1$ -tailed) (see Table 4.8).

Table 4.8 Correlation between SPS and AM Retrieval during SPS (1-tailed)

	Nondepressed		Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
MEPS Means score	.270	.550*	.694**	.536*
MEPS Effectiveness score	.472*	.102	.359	.639**
Categoric Memory				
MEPS Means score	.038	-.334	-.599**	-.088
MEPS Effectiveness score	-.439(.051)	.038	-.518*	-.365

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

4.4 Discussion

This experiment was designed to examine the impact of thinking style (rumination versus distraction) on SPS as well as a key process argued to be involved in SPS, the retrieval of specific versus categoric AMs. The results with respect to SPS performance are consistent with previous investigations involving a rumination manipulation (e.g., Watkins & Baracaia, 2002; Kao et al., 2006, see also Chapter 3 of this thesis) in that rumination interacts with depression to influence the quality of SPS solutions produced. That is, depressed ruminators are significantly more impaired than depressed distracters, nondepressed ruminators and nondepressed distracters on two outcome measures of SPS: number of relevant means and effectiveness of the solution. This finding was not consistent with the finding in Study 1 where only a significant difference was found on the MEPS effectiveness measure. It seems that rumination interacts with level of mood severity (i.e., dysphoria versus depression), to influence MEPS performance. The data suggest that the effectiveness measure may be more sensitive to the effects of rumination because it was impaired under the rumination manipulation

in both the dysphoric and the clinically depressed samples.

However, when AM retrieval during SPS was examined, a more complex relationship emerged. The results indicated that the rumination manipulation influenced AM retrieval during SPS in both the depressed and nondepressed conditions. While there was no evidence for a depressed status and thinking style interaction, planned contrast comparisons provided some evidence for the expected pattern. Further analysis (Independent-sample t-test) demonstrated that depressed ruminators did retrieve less specific AMs during SPS than depressed distracters, but this difference was not observed on the categoric AM retrieval during SPS. This result provides evidence that distraction enhances specific memory retrieval during SPS.

However, when the association between AM retrieval during SPS and SPS performance was examined, some interesting findings emerged that supported the argument that AM retrieval during SPS is an important mechanism. First of all, specific AM retrieval during SPS was found to be associated with better SPS performance; categoric AM retrieval during SPS was also found to be associated with poorer SPS in the total sample of 60 participants. Furthermore, when this association was examined within groups, specific AM retrieval during SPS was strongly positively associated with the performance of SPS in all four groups. Greater retrieval of specific AMs during SPS resulted in better performance on the SPS task. This association was the most salient in the depressed distracters as both of their SPS measures were significantly associated with their specific AM retrieval during SPS. The specific AM retrieval was only found to be associated

with MEPS means scores in depressed ruminators and nondepressed distracters; and the MEPS effectiveness score in nondepressed ruminators.

It seems then as if the distraction manipulation is enhancing awareness of mental processes. Indeed, Watkins and Baracaia (2002) argued that process-focused questions significantly improve SPS performance in depressed patients compared to either no questions group or state-oriented questions group. The process-focused questions involve focusing on “How am I deciding to solve this problem”. Although the manipulation in the present study did not specifically direct individuals to think about the processes involved in processing, it seems possible that this manipulation was breaking the negative thinking style by improving mood and freeing more cognitive resources for accessing specific AMs. Future work should consider using a process-focused manipulation to see if the effects would be enhanced.

In contrast, categoric AM retrieval during SPS was only negatively associated with SPS performance in the depressed ruminators. It seems that categoric AM retrieval during SPS is affected by the rumination manipulation for individuals experiencing depression; greater retrieval of categoric AMs during SPS was associated with poorer performance on both SPS measures. This result suggests that the rumination/distraction manipulation is influencing memory processing during SPS. Goddard et al. (1996) found an association between categoric AM retrieval and SPS performance. They hypothesized that categoric AM retrieval was facilitating ruminative thinking and creating poor problem orientation. The present correlation tentatively suggests that rumination is also creating greater

categoric AM retrieval. The memories retrieved could be instances of failure, which according to the differential activation hypotheses lead to more negative thinking (Williams et al., 2005). Hence a solution to the problems fails to emerge. More negative thinking and negative global self-attributions follow. Ciesla and Roberts (2002) indicated that one possible mechanism that influences the rumination process is “negative cognitive styles”. Negative cognitive styles refer to “maladaptive beliefs about the self”, which is defined operationally as low self-esteem and high scores on the Dysfunctional Attitude Scale (DAS) (Weissman & Beck, 1978), or a internal, global, stable attributional style to stressful events. Previous work by Robinson and Alloy (2003) demonstrated an interaction between rumination and negative cognitive style, and this interaction predicted the previous and future episodes of depression in college undergraduate students. Morrow and Nolen-Hoeksema (1990) also indicated that rumination enhancing the perpetuating effects of negative cognitive styles by encouraged the pre-existing negative cognitive styles occurring more often in depressed individuals. Taken these implications together, they shed some lights on results of the present study that the rumination encourages the negative cognitive styles in depressed people in turn affects the subsequent performance such that more categoric AM retrieval was associated with poorer SPS (i.e., fewer relevant means and less effective solutions on the MEPS).

Considered together, the findings on the association between AM retrieval during SPS and SPS performance are different from those of Goddard et al. (1996). Goddard et al. found a more pronounced association between categoric AM retrieval during SPS and SPS performance. Whereas only a significant

positive correlation was found between specific AM retrieval and the MEPS effectiveness score in the nondepressed control group. The results in the present study suggest the importance of both specific and categoric AM retrieval during the SPS process. Future works need to be done to further examine the impact that rumination/distraction have on AM retrieval during SPS and SPS performance, by using more refined thinking style manipulations such as process-focused manipulation used by Watkins and Baracaia (2002).

When the results of the present study are considered together with results of Study 1 (see Chapter 3 in this thesis), a conclusion can be drawn such that rumination may affect different processes involving SPS such as AM retrieval during SPS, depending upon the severity of the mood (i.e., dysphoria and clinical depression). If mood is less severe (i.e., in the dysphoric state), the effects on AM retrieval during SPS are overshadowed by lower mood affecting processes like the spontaneous initiation of useful strategies (e.g., Hertel & Hardin, 1990). However, as mood becomes more severe (i.e., in the clinically depressed state), the ruminative effects on AM retrieval during SPS become more pronounced and detrimental.

In conclusion, the results demonstrated quite clearly that rumination has a negative impact on SPS when depressed mood is present. However, the results also indicate that different processes may be affected, depending on the severity of the mood. Research needs to examine these processes in greater depth in order to design interventions to improve SPS performance in individuals with different levels of mood severity.

CHAPTER 5

STUDY 3

AUTOBIOGRAPHICAL MEMORY RETRIEVAL IN DEPRESSION: A CROSS-CULTURAL STUDY

5.1 Literature Review

There is well established evidence demonstrating that depression is associated with distinct patterns of AM retrieval (cf. Williams & Dritschel, 1998; Williams & Scott, 1992). Research has shown that depressed individuals have greater difficulty in retrieving specific AMs than nondepressed controls. A specific AM refers to a memory for an event lasting less than one day and occurring at a particular time and place (e.g., “playing squash last Friday night”). When asked to retrieve a specific AM, depressed individuals are more likely to produce overgeneral memories, which are categoric in form. Categoric AMs are memories for collections of events such as “times that I have gone to the cinema”.

According to Conway and Pleydell-Pearce (2000), specific AM retrieval can occur through a generative process. This generative process involves first accessing an underlying knowledge base which is almost always general autobiographical knowledge in the form of general event representations. In addition, it is likely that working-self goal structures are also activated at this early stage. Once pathways through the knowledge base are activated, this knowledge becomes available to central executive control processes and to the retrieval model that evaluates this information. The specific AM is retrieved

through activation across indices of the autobiographical knowledge base together with the retrieval model used to direct the pattern of retrieval. It is possible that with depression a global negative model of self is activated at this early stage. This model of self increases the tendency to access global event representations and stop the search process at this point. Further limited central executive resources associated with depression (Williams, 2006) may increase the difficulty in evaluating if this information matches retrieval requirements.

An interesting question, which has never been addressed with respect to the AM bias exhibited by depressed individuals, is whether it occurs cross-culturally. There is some evidence that culture may influence the ability to retrieve specific AM of participants from the nondepressed population (Han, Leichtman, & Wang, 1998; Wang, 2001). Wang (2001) investigated the interactive relationship between AMs and cultural construal of the self. In this study, she compared Chinese and American college students' style of reporting their earliest memories using a memory questionnaire as well as their type of self-descriptions on the abbreviated Twenty Statements Test (TST; Kuhn & McPartland, 1954).³ The results showed that the earliest memories reported by the Americans were more specific, self-focused, emotionally elaborate and lengthier than their Chinese counterparts. The Chinese students focused on collective activities and were more likely to describe events in an emotionally neutral tone. Thus, it could be that different working-self goal structures may be operating and then contributing to differences in AM retrieval patterns between Western and Eastern people. Moreover, according to Wang's finding (2001), the Americans exhibited a more salient

³ In the TST, participants are required to describe themselves by completing 20 sentences; each begins with "I am". This instrument was considered a reliable measure for an index of cultural construal of self in the dimension of independent and interdependent (see Wang, 2001, pp. 222).

tendency to express autonomous orientation than their Chinese counterparts. In addition, compared to the Americans, the Chinese mentioned other people in their memory narratives more frequently. The results suggested that people from different cultures have different underlying memory representations, which are strongly shaped by their cultural surroundings.

This hypothesis is consistent with research demonstrating that culture influences conceptualizations of the self. Western cultures are characterized as emphasizing an *independent-oriented self* whereby the self is viewed as an autonomous being that is separate from other individuals (Wang, 2001). This view of self arises from a culture that emphasizes self-expression, individual uniqueness and personal efficiency. In contrast, Eastern cultures emphasize an *interdependent self* whereby the self has important social roles, duties, and responsibilities and is viewed as part of existing relationships (Markus & Kitayama, 1991; Wang, 2001). This view of self arises from a culture that emphasizes group solidarity, interpersonal connectedness and personal humility.

Taking these independent orientation and interdependent orientation into account, it was speculated that the specific and general AM retrievals might serve different functions in different cultures. For example, the specific AM “having a birthday party with Chelsea Clinton” may help to differentiate one’s self from others in a society that respects individuality; whereas the general memory “going to church everyday” is a more socially conventional description and helps people to fit into a society that values interdependency (see Wang, 2001, pp. 229). These cultural differences may be reflected in people with depression such that

depressed individuals from Eastern societies may retrieve fewer overgeneral AMs than depressed individuals from Western societies.

However, it could also be that an interaction might occur such that culture affects the production of specific AMs in the nondepressed controls but not in the depressed groups. Such an interaction might arise if central executive functioning impairments associated with depression make the retrieval of specific AMs more difficult irrespective of the effects of culturally influenced working self. Another possible source for this interaction might be that depression creates a more ruminative thinking style in Western people. This ruminative thinking style would lead to greater global negative self-representations and more categoric AM retrievals. In Eastern cultures, depression may lead to greater self-focus and the retrieval of more specific negative memories.

The aim of the present study was to examine these issues (i.e., the interaction between depression and culture for AM retrieval on the AMT cueing task) using clinically depressed people and nondepressed controls from Taiwan and Britain respectively. Secondly, the AM responses on the AMT cueing will also be compared cross-culturally in terms of autonomous orientation and self-other ratio to examine the tendency to express autonomy and the frequency of mentioning self relative to the frequency of mentioning other people between two cultures.

5.2 Method

5.2.1 Design

The design was a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) between subjects design. The AM retrieval on the AMT cueing task, the tendency to show autonomous orientation and the self-other ratio served as the dependent measurements.

5.2.2 Participants

Fifteen Taiwanese clinically depressed patients (Age: $M = 37.6$ years old, $SD = 10.32$ years old) were recruited from the Department of Psychiatry, the Chung-Shang Medical University Hospital. Fifteen British clinically depressed patients (Age: $M = 43.13$ years old, $SD = 5.88$ years old) recruited from the Affective Disorders Centre of Ninewells Hospital in Dundee as well as the Health Centre in St. Andrews took part in this experiment. ⁴All the patients were interviewed using the SCID to assess whether they met the diagnosis of Major Depressive Disorder according to the DSM-IV. Participants were excluded if they had either any manic episode, or any psychotic symptoms (i.e., delusion and hallucination) or their depression symptoms were due to the organic reasons such as brain damage.

Fifteen nondepressed Taiwanese controls (Age: $M = 36.6$ years old, $SD = 9.15$ years old) were recruited from a local community society through advertisement. Fifteen British nondepressed participants (Age: $M = 44.4$ years old, $SD = 5.34$ years old) were recruited through advertisements around St. Andrews. All the

⁴ The British participants in this study were from part of the Study 2 in this thesis.

nondepressed participants were assessed using the structured clinical interview for DSM-IV to ensure that they were not currently suffering from Major Depressive Disorder nor experiencing any significantly low mood.

The clinically depressed and nondepressed participants from two cultures were matched in their years of education and the BDI scores. There was a main effect of age such that the Taiwanese participants were significantly younger than the British participants (see Section 5.2.2.1). ANCOVAs using age as a covariate were also conducted to partial out this effect (See Section 5.3.1 for analysis of AM retrieval on the AMT and Section 5.3.3 for analysis of Autonomous orientation and Self-other ratio).

5.2.2.1 Age

To ensure that there were no differences in age, a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) ANOVA was conducted. This analysis showed a main effect of culture ($F(1, 56) = 10.47, p < .01$), such that the Taiwanese participants were significantly younger ($M = 37.1, SD = 9.6$) than the British participants ($M = 43.77, SD = 5.56$) (See table 5.1). Neither a main effect of depressed status ($F(1, 56) = 0.12, p > .05$), nor a culture \times depressed status interaction ($F(1, 56) = 0.244, p > .05$), was found.

5.2.2.2 Years of Education

To ensure that there were no differences in years of education received, a 2

(culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) ANOVA was conducted and no significant differences were found (main effect of depressed status: $F(1, 56) = 3.383$; main effect of culture: $F(1, 56) = .491$; interaction: $F(1, 56) = .928$; all $p > .05$) (see Table 5.1).

5.2.2.3 The BDI Score

The total BDI score was compared between the British and the Taiwanese depressed patients and the nondepressed controls. A 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) ANOVA demonstrated a main effect of depressed status ($F(1, 56) = 612.19, p < .01$). Neither a main effect of culture ($F(1, 56) = 3.17, p > .05$), nor a culture \times depressed status interaction ($F(1, 56) = 2.95, p > .05$), was found. These results were replicated using age as a covariate, with the same results being produced such that there was a main effect of depressed status ($F(1, 56) = 604.80, p < .01$). There was no main effect of culture ($F(1, 56) = 3.95, p > .05$) and no culture \times depressed status interaction ($F(1, 56) = 2.73, all p > .05$) (see Table 5.1).

Table 5.1 Mean Years of Age, Years of Education and the BDI scores.

	British		Taiwanese	
	Nondepressed	Depressed	Nondepressed	Depressed
Age	44.40 (5.34)	43.13 (5.88)	36.60 (9.15)	37.60 (10.32)
Years of Education	8.67 (2.69)	8.00 (2.93)	9.93 (3.33)	7.80 (2.81)
BDI	3.33 (1.05)	31.07 (4.54)	3.27 (1.67)	27.40 (6.43)

5.2.3 Materials

5.2.3.1 Beck Depression Inventory (BDI; Beck et al., 1961)

The BDI (Beck et al., 1961) is a 21-item self-report inventory measuring the degree of depression occurring over the past 2 weeks (see Appendix 1). The 21-item inventory focuses on various aspects of depression, which include subjective mood state, the feelings of self-esteem, propensity to initiate action, motivation for completing tasks, as well as the quality of sleep and appetite.

The BDI, Mandarin-Chinese version was translated by Ko in 1991 from the BDI (cf. Wang, 2001). The Cronbach's Alpha was .87 and the split-half reliability was .84, which has been corrected using the Spearman-Brown prophecy formula for the BDI Mandarin-Chinese version (cf. Wang, 2001).

5.2.3.2 Autobiographical Memory Test (AMT; Williams & Broadbent, 1986)

The AMT requested that the participants to retrieve a specific AM as quickly as possible in response to a cue word. 10 cue words were used which consisted of

five positive words (i.e., happy, safe, interested, successful, and surprised) and five negative words (i.e., sorry, angry, clumsy, hurt, and lonely) presented orally and visually to the participants in this order, with positive and negative words alternating (see Appendix 3). A maximum of 60 seconds was given to retrieve a memory in response to each cue word. If a response was not given in that time, a score of 60 seconds was recorded and the next word was given. The responses were scored for the specificity of the participants' first response. A tape recorder was used to record all the responses.

There were three codings involved in this study. First of all, the AM responses were categorized as specific AM, extended AM, and categoric AM according to the criteria in the previous chapter (see Section 2.3.1). Furthermore, in an attempt to capture qualitative differences between the interdependent and independent self, the AM responses were further rated in terms of autonomous orientation as well as self-other ratio following Wang's coding of memory variables (2001). The autonomous orientation refers to the tendency to express autonomy and self-determination in the content of their memories. The frequency with which they mentioned in their 10 AM responses, any one of the following four categories was recorded: (1) reference to personal needs, desires, or preferences; (2) reference to personal dislikes or avoidance; (3) references to personal evaluations, judgments, or opinions regarding other people, objects, or events; and (4) reference to retaining control over one's own actions and resisting group or social pressure (cf. Wang, 2001). The self-other ratio is the frequency with which the participant mentioned themselves respective to other people in their 10 AM responses. The numbers were calculated separately and finally a ratio (the number

of times they mentioned themselves over the number of times they mentioned other people in 10 AM responses) was obtained for each participant to indicate their social orientation.

5.2.3.3 Cultural Equivalent Consideration

Translation and back-translation were carried out to ensure that the two versions of experimental materials of each language are literally and semantically equivalent.

To ensure that the two different versions of the AMT cueing task are identical in their semantic meanings, a Mandarin-Chinese equivalent of the AMT cueing task was developed which consisted of emotional cue words that had identical semantic meanings. To develop the Mandarin-Chinese version of the AMT cueing task, the Academia Sinica Bilingual Ontological Wordnet was employed. This programme provides an exact translation of the word meanings from Chinese to English as well as from English to Chinese, while holding word frequency constant.

5.2.4 Procedure

The study conducted in Taiwan received ethical approval from the Institutional Review Board, Chung Shan University Hospital. The study in the U.K. received ethical approval from the Tayside Committee on Medical Research Ethics and extended to Fife area by Fife NHS Board, Local Research Ethics Committee.

Informed consent was sought from all before starting the experiment. All participants were first asked to complete the BDI, or its Mandarin-Chinese version to assess their current emotional state. Then, participants completed the AMT cueing task, or its Mandarin-Chinese version. They were required to retrieve a specific AM in response to 10 (5 positive and 5 negative) emotional cue words, which are orally and visually presented with positive and negative words alternating. Their responses were categorized as specific memory, extended general memory, and categoric general memory. The definitions for these memories are explained in Section 2.3.1, Chapter 2. At the end of experiment, participants were debriefed.

5.3 Results

5.3.1 AM Retrieval on the AMT Cueing Task

The number of specific and categoric memories retrieved by all four groups on the AMT cueing task was compared (see Table 5.2 & 5.3).

A 2 (Culture: British vs. Taiwanese) \times 2 (Depressed status: Nondepressed vs. Depressed) \times 2 (Valence: Positive vs. Negative) mixed ANOVA was used to analyze number of specific memory retrieval to positive and negative cues. We did not find any significant within-subjects effect (of valence $F(1, 56)=0.396, p > .05$).

Specific Memory

Table 5.2 Number of specific memory retrieved to positive and negative cues

	British		Taiwanese	
	Nondepressed (n = 15)	Depressed (n = 15)	Nondepressed (n = 15)	Depressed (n = 15)
Number of Specific Memory to Positive Cue M (SD)	3.73 (0.88)	1.20 (1.42)	2.80 (1.57)	1.40 (1.12)
Number of Specific Memory to Negative Cue M (SD)	3.40 (1.18)	1.27 (1.10)	2.20 (1.26)	1.67 (1.11)

A significant main effect of Depressed status, $F(1, 56) = 63.349$, $p < .001$, showed that depressed participants offered significantly fewer specific memories than nondepressed participants. However, no main effect for Culture has been found ($F(1, 56) = 3.419$, $p > .05$). The Culture \times Depressed status interaction, $F(1, 56) = 10.865$, $p < .01$, explained group differences in terms of number of specific memories offered by British nondepressed participants significantly more than those offered by Taiwanese nondepressed participants, $t(28) = 3.127$, $p < .01$.

No other 2-way or 3-way interaction have been found (Valence \times Depressed status interaction, $F(1, 56) = 1.766$, $p > .05$; Valence \times Culture interaction, $F(1, 56) = 0.005$, $p > .05$; Valence \times Depressed status \times Culture interaction, $F(1, 56) = 0.240$, $p > .05$).

Considering there was significant age difference between groups, firstly a 2 (Culture: British vs. Taiwanese) \times 2 (Depressed status: Nondepressed vs. Depressed) ANCOVA (with age as a covariate) was conducted to partial out the

affect of the age difference between British and Taiwanese participants. The results paralleled the above findings. We found a main effect of depression status, $F(1, 56) = 62.728, p < .001$, also a culture by depressed status interaction has been found, $F(1, 56) = 10.986, p < .01$. However, there was no culture main effect, $F(1, 56) = 3.735, p > .05$.

Categoric Memory

A 2 (Culture: British vs. Taiwanese) \times 2 (Depressed status: Nondepressed vs. Depressed) \times 2 (Valence: Positive vs. Negative) mixed ANOVA was used to analyze number of categoric memory retrieval to positive and negative cues. We did not find any significant within-subjects effect (of valence $F(1, 56) = 1.796, p > .05$)

Table 5.3 Number of categoric memory retrieved to positive and negative cues

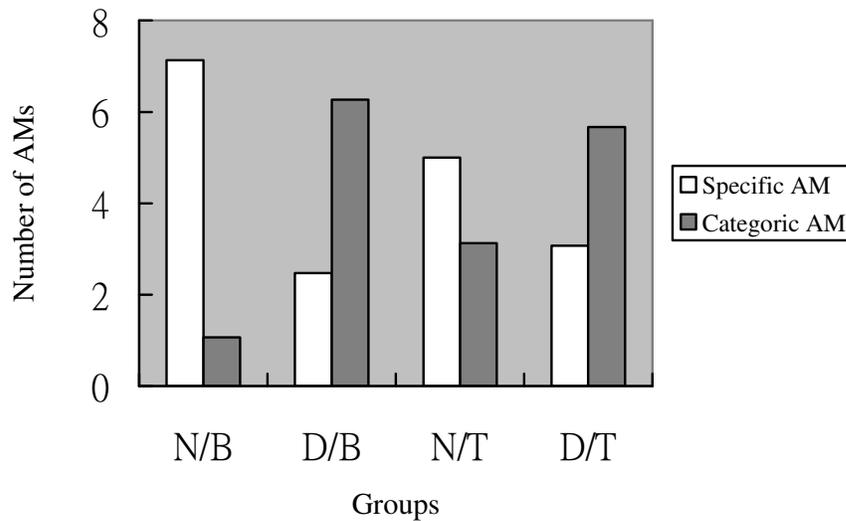
	British		Taiwanese	
	Nondepressed (n = 15)	Depressed (n = 15)	Nondepressed (n = 15)	Depressed (n = 15)
Number of Categoric Memory to Positive				
Cue	0.42	3.40	1.47	3.20
M (SD)	(1.32)	(1.40)	(1.25)	(0.94)
Number of Categoric Memory to Negative				
Cue	0.65	2.87	1.67	2.47
M (SD)	(1.64)	(1.46)	(0.98)	(0.99)

A significant main effect of depressed status, $F(1, 56) = 101.529, p < .001$, showed that depressed subjects offered significantly more categoric memories than nondepressed participants. There was a main effect of culture, $F(1, 56) = 3.559, p < .05$. The Culture \times Depressed status interaction, $F(1, 56) = 10.529, p$

< .01, explained group differences in terms of number of categoric memories offered by British nondepressed participants significantly fewer than those offered by Taiwanese nondepressed participants, $t(28) = -4.384, p < .05$.

No any 2-way or 3-way interaction been found (Valence \times Depressed status interaction, $F(1, 56) = 3.395, p > .05$; Valence \times Country interaction, $F(1, 56) = 0.000, p > .05$; Valence \times Depressed status \times Country interaction, $F(1, 56) = 0.253, p > .05$).

Considering there was significant age difference between groups, firstly a 2 (Country: British vs. Taiwanese) \times 2 (Depressed status: Nondepressed vs. Depressed) ANCOVA (with age as a covariate) was conducted to partial out the affect of the age difference between British and Taiwanese participants. The results paralleled the above findings. We found a main effect of Depression status, $F(1, 56) = 102.690, p < .001$, as well as a main effect of Culture, $F(1, 56) = 5.666, p < .05$, as well as a Culture \times Depressed status interaction has been found, $F(1, 56) = 11.169, p < .01$.



B/N: British Nondepressed

T/N: Taiwanese Nondepressed

D/B: British Depressed

T/D: Taiwanese Depressed

Figure 5.1 AM Retrieval on the AMT (Dysphoric Status × Culture)

5.3.2 Association between the BDI Scores and AM Retrieval on the AMT Cueing Task

To examine the association between the types of AM retrievals on the AMT cueing task (i.e., specific AM retrieval and categoric AM retrieval) and the BDI scores, a Pearson Correlation was carried out. A significant negative correlation was found between the specific AM retrieval and their BDI scores in the total sample of 60 participants ($r = -.672, p < .01$) such that higher BDI scores (more depressed) were related to retrieval of fewer specific AMs. Also a significant positive correlation was found between the categoric AM retrieval and their BDI scores in the total sample of 60 participants ($r = .727, p < .01$). Thus more depressed participants (higher BDI scores) retrieved a greater number of categoric AMs.

Table 5.4 Correlation between the BDI Scores and AM Retrieval on the AMT

	British (n = 30)	Taiwanese (n = 30)
Specific Memory	-.874**	-.428*
Categoric Memory	.906**	.524**

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

When looking at the correlation between the BDI score and AM retrieval on the AMT cueing task across the two countries, there was a significant negative correlation between the BDI score and number of specific AM retrieval in both British and Taiwanese participants respectively (see Table 5.4: $r = -.874, p < .01$; $r = -.428, p < .05$). Moreover, there was also a significant positive correlation between the BDI score and number of categoric AM retrieval in both British and Taiwanese groups (see Table 5.4: $r = .906, p < .01$; $r = .524, p < .01$). The scattergram of the correlations for Table 5.4 is shown below. No significant outliers are observed. Therefore the correlations are not reliant on outliers (see Appendix 8).

Table 5.5 Correlation between the BDI Scores and AM Retrieval on the AMT

	British		Taiwanese	
	Nondepressed (n = 15)	Depressed (n = 15)	Nondepressed (n = 15)	Depressed (n = 15)
Specific Memory	-.651**	-.337	-.228	.293
Categoric Memory	.259	.435	.393	-.663**

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

However, when further examining the correlations between the British/Taiwanese versus depressed/nondepressed groups, the results demonstrated that there was significant negative correlation between the specific

AM retrieval and the BDI scores in British nondepressed participants such that the British nondepressed participants retrieved significantly less specific AMs when they were more depressed (see Table 5.5: $r = -.651, p < .01$). Moreover, there was a significant negative correlation between the categoric AM retrieval and the BDR scores in Taiwanese depressed participants. That is, the Taiwanese depressed participants retrieved significantly less categoric AMs when they were more depressed (see Table 5.5: $r = -.663, p < .01$).

5.3.3 Qualitative Analysis: Autonomous Orientation & Self-other Ratio

A 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) ANOVA was conducted to evaluate the tendency to express autonomous orientation in their AM responses. First of all, this revealed a significant main effect of culture. The British participants ($M = 1.77, SD = 0.97$) showed more autonomous orientation than the Taiwanese Participants ($M = 1.20, SD = 0.71$) ($F(1, 56) = 6.881, p < .05$) (see Table 5.6). There was also an approaching significance main effect of depressed status ($F(1, 56) = 4.024, p = .05$). However, there was no significant culture \times depressed status interaction effect ($F(1, 56) = .214, p > .05$).

Table 5.6 Autonomous Orientation & Self-other Ratio

	British		Taiwanese	
	Nondepressed (n = 15)	Depressed (n = 15)	Nondepressed (n = 15)	Depressed (n = 15)
Autonomous orientation				
M	1.93	1.60	1.47	0.93
(SD)	(1.16)	(0.74)	(0.52)	(0.80)
Self-other ratio				
M	3.38	3.56	1.63	2.15
(SD)	(2.76)	(1.19)	(0.55)	(0.85)

Considering there was significant age difference between groups, firstly a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) ANCOVA (with age as a covariate) was conducted to partial out the effect of the age difference between British and Taiwanese participants. The results paralleled the above findings. A main effect of culture was found ($F(1, 56) = 4.953, p < .05$), also a approaching significant main effect of depressed status was found ($F(1, 56) = 3.950, p = .052$). However, there was no significant culture \times depressed status interaction effect ($F(1, 56) = .239, p > .05$).

When examining the Self-other ratio, only a significance main effect of culture was found ($F(1, 29) = 14.856, p < .001$). The British participants ($M = 3.47, SD = 2.09$) mentioned themselves more often than the Taiwanese Participants did ($M = 1.89, SD = 0.75$) ($F(1, 56) = 6.881, p < .05$). Neither a main effect of depressed status ($F(1, 56) = .730, p > .05$) nor a culture \times depressed status interaction effect was found ($F(1, 56) = .180, p > .05$) (see Table 5.6).

Considering there was significant age difference between groups, firstly a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) ANCOVA (with age as a covariate) was conducted to partial out the effect of the age difference between British and Taiwanese participants. The results paralleled the above findings. A main effect of culture was found ($F(1, 56) = 14.604, p < .001$), also a approaching significant was found ($F(1, 56) = 3.950, p = .052$). However, there was neither significant main effect of depressed status ($F(1, 56) = .714, p > .05$) nor culture \times depressed status interaction effect ($F(1, 56) = .227, p > .05$).

When looking at the association between the BDI scores and autonomous orientation as well as self-other ratio across the four groups, only a significant negative correlation between the BDI scores and autonomous orientation in the British depressed group was identified (see Table 5.7: $r = -.632, p < .05$).

Table 5.7 Correlations between the BDI, Specific AM, Categorical AM and Autonomous Orientation & Self-other Ratio

	British		Taiwanese	
	Nondepressed (n = 15)	Depressed (n = 15)	Nondepressed (n = 15)	Depressed (n = 15)
BDI score				
Autonomous orientation	-.039	-.632*	-.072	-.384
Self-other ratio	-.175	.101	-.240	-.090
Specific Memory				
Autonomous orientation	.342	.229	-.401	.262
Self-other ratio	.500	.148	-.324	.641*
Categorical Memory				
Autonomous orientation	.006	-.539*	.416	-.080
Self-other ratio	-.068	-.114	.347	-.509(*)

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

Further examining the association between AM retrieval and autonomous orientation as well as self-other ratio, categorical AM retrieval by the British depressed group was significantly negatively correlated with their autonomous orientation scores (see Table 5.7: $r = -.539, p < .05$). The more categorical AMs they retrieved on the AMT cueing task, the less autonomous tendency they expressed in their AM recollections. As to the Taiwanese depressed participants, their specific AM retrieval was significantly correlated with their self-other ratio (see Table 5.7: $r = .641, p < .05$). The more specific AMs they retrieved on the AMT task, the more often they tended to mention themselves in their AM recollections. Furthermore, in the Taiwanese depressed group, there was an approaching significant negative correlation between their categorical AMs and the Self-other ratio (see Table 5.7: $r = -.509, p = .053$).

5.4 Discussion

The main aim of this study was to examine the AM retrieval on the AMT cueing task in the British and the Taiwanese clinically depressed groups and nondepressed control groups. Consistent with previous research (Williams & Dritschel, 1988), the clinically depressed patients retrieved significantly fewer specific AMs and more categoric AMs in response to emotional cue words on the AMT cueing task when compared to the nondepressed people. Furthermore, a culture by depressed status interaction was observed in the present study such that the British nondepressed participants retrieved significantly more specific AMs as well as fewer categoric AMs than the Taiwanese nondepressed participants. However, there were no significant differences between the clinically depressed groups as a function of culture in terms of their AM retrieval pattern. Thus the interaction was carried only by differences in the nondepressed groups.

One conclusion from this study is that the Taiwanese nondepressed participants employed a more overgeneral AM retrieval style than the British counterparts. This finding is consistent with Wang's study (2001), which investigated the difference of the childhood recollections between the Chinese and the American college students. The results in Wang's study showed that, compared to the Chinese college students, the American college students reported lengthier, more specific, self-focused and emotionally elaborated memories about their earliest childhoods. Wang (2001) concluded that specific AM and overgeneral AM play distinctive roles in a person's self-development in different cultures. Specific memory (e.g., memory about having a birthday party with Chelsea Clinton, see

Wang, 2001, pp. 229, for a reference) is unique to the individual and helps the individual to distinguish oneself from the others. Whereas general memory offers routine activities (e.g., a memory about going to church everyday, see Wang, 2001, pp. 229 for a reference), which de-emphasizes the unique role of the individual in society.

In addition, Wang and Conway (2004) further examined AM in a questionnaire study in European American and Chinese adults. The results demonstrated that the European American adults provided more emotionally focused and individually focused memories. In contrast, the Chinese adults, whose memory recollections are more focused on social interaction and interpersonal relationships, provided less individualistic memories and less emotionally elaborated memories. They provided more similar answers when asked to retrieve a memory. For example, when asked to recollect New Year's Day, they would offer similar answers such as having hotpot with their family.

Markus and Kitayama (1991) argued that the way that people experience and express their emotions is a function of their self-system. They proposed two different self-construals, the independent view of the self and the interdependent view of the self. The independent view of the self is exemplified in most of the Western countries whereas the interdependent view of the self is exemplified in most of the Eastern countries. In their research, they proposed that Westerners attend more to ego-focused emotions. The Easterners, on the other hand, emphasize the other-focused emotion. For example, the Westerners reported experiencing ego-focused emotions such as joy, sadness, anger, guilt, fear, shame

and disgust longer and more intensely than their Japanese counterparts, who reported more bodily symptoms in a comparative study (cf., Matsumoto, Kudoh, Scherer, & Wallbott, 1988). Markus and Kitayama also mentioned that the Easterners, unlike the Westerners, do not go directly to “the heart of the matter”. When discussing their problems, the Easterners will first start from a common point of view. For example, they will start by stating their common problems and pointing out all the limitations that all participants have. Only then will they present their individual opinions. This vague response pattern may be associated with their cognitive style and facilitates a more general pattern in experiencing and expressing their thoughts, especially for the emotional materials. This independent versus interdependent orientation has also been reported by Conway, Wang, Hanyu, and Haque (2005). They examined the descriptions of AMs in children from Japan, China, Bangladesh, England, and the United States. From the content analysis, they found that Chinese children had more interdependent self-focus than children from the United States, who had more independent self-focus. The results strongly demonstrated that the content of memories is influenced by culture.

Based on these findings, one conclusion may be that the nondepressed British people are more likely to represent the emotional features of the events that they are remembering than the nondepressed Taiwanese. It must be noted that emotional cue words were used on the AMT cueing task in this study. This emotional dimension could partially explain why the British nondepressed participants were more specific in their recall than the Taiwanese nondepressed participants. The emotional label associated with the word cue could make

specific emotional events more available for recall. The inclusion of a neutral word condition would help clarify the role of emotion in determining the specificity of AM recall from a cross-cultural perspective. Another conclusion is that the construal of self is different in the two nondepressed samples. The British sample may be more self-focused than the Taiwanese nondepressed sample.

The interesting question here is why the interaction failed to extend to the clinically depressed sample. One possibility is that depression is impairing the functioning of the central executive and this reduced activity is causing overgeneral AM retrieval to occur. Support for this argument comes from Dalgleish, Williams, Golden, Perkins, Barrett, Barnard, Au-Yeung, Murphy, Elward, Tchanturia, & Watkins (2007) who argued that overgeneral AMs may result from impoverished central executive functioning. Depression is associated with diminished central executive functioning (Williams, 2006) No work to date has really examined the relative components of the working self versus the central executive functioning in the self-memory system framework (Conway & Pleydell-Pearce, 2000). Future work needs to test this hypothesis directly by manipulating central executive load in the nondepressed cross cultural samples to see if both culture groups converge towards a more categoric AM retrieval style.

The correlational data, in contrast, seem to indicate that there may be a subtle interaction between depression, AM retrieval and culture. Across all participants irrespective of depressed status or culture, specific AM retrieval was negatively associated with the level of depressed mood (i.e., measured by the BDI), whereas categoric AM retrieval was positively associated with the level of depressed mood

in all the participants regardless of their depressed status and culture. However, when these correlations were examined within groups, a different pattern emerged. A significant negative correlation was found for specific AM retrieval and the level of depressed mood in the British nondepressed group. Whereas a significant negative correlation was found between categoric AM retrieval and the level of depressed mood in the Taiwanese depressed group. These results demonstrated that the Taiwanese depressed people retrieved less categoric AMs when they were more depressed. One possible speculation for this reversed phenomenon found in the Taiwanese depressed people is that rumination is interacting with depression and having different effects on AM retrieval. In participants from a Western culture, greater rumination is associated with increased depression (Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1991); rumination also leads to more categoric retrieval (Watkins et al., 2000). Therefore it seems that rumination could be one mechanism underlying increased categoric retrieval in the British depressed sample.

In contrast, for participants from an Eastern culture, it is possible that rumination may have different consequences. Eastern people show more tendencies to reflect to themselves on the rightness of their actions when they are facing a problem (Wang, 2004; Wang & Conway, 2004). Therefore, this particular reflective style may lead to greater self-focus in the Taiwanese depressed group when experiencing increased depression. As a result more specific negative retrieval may occur. Thus, It could be that rumination is not operating in the same way in the two culture groups. Future work is needed to explore this possibility.

One interesting phenomenon was observed in the Taiwanese depressed sample was the association between their AM retrieval and Self-other ratio. The results indicated that the depressed Taiwanese people demonstrated more significant self-focused concerns in their AM recollections, both specific and categoric (approaching significant). When they were depressed, the Taiwanese people focused more on themselves as opposed to others in the content of both their specific and categoric AMs. This self-focused style may cause the Taiwanese depressed people to have more difficulties in fitting into their society where an interdependent self-concept is emphasized (e.g., they may encounter more interpersonal problems in their daily life). However, in the British depressed people, a greater level of depression was only associated with less autonomous orientation. This change in content shows that more global self-reflection is occurring. Culture determines a person's sense of self and the self-perception such as being autonomous or relational (Wang, 2001, 2003). Wang and Conway (2004) have argued that Westerners, living in a culture which emphasis autonomy, are encouraged to remember their personal experiences in more specific detail; therefore they can differentiate themselves from other people.

In conclusion, the findings of the present study suggested that culture seems to impact AM retrieval differently in depressed and nondepressed samples. It seems as if different mechanisms are operating in depression cross-culturally. However, these are merely preliminary findings from one study. Further research is necessary to replicate these findings and to investigate the mechanisms underlying this effect.

CHAPTER 6

STUDY 4

THE EFFECT OF RUMINATION/DISTRACTION ON SPS AND AM RETRIEVAL DURING SPS IN CLINICAL DEPRESSION: A CROSS-CULTURAL STUDY

6.1 Literature Review

Major Depressive Disorder is a universally severe mood disorder that has specific affective, cognitive and somatic features, such as feeling low nearly everyday, loss of pleasure from usual activities, fatigue and difficulty in concentrating (Davidson & Neale, 2001). Prevalence rates for depression vary considerably across different cultures; rates range from 1.5 percent in Taiwan to 19 percent in Beirut, Lebanon (cf. Davidson & Neale, 2001). There are also numerous epidemiological studies that have shown that the features of depression can vary between cultures. For example, somatization is the dominant chief complaint in Chinese depressed people (Cheung, Lau, & Waldman, 1982; Kleinman & Good, 1985). In many Chinese societies, individuals tend to report feelings of boredom, discomfort and pressure whereas Western individuals report feelings of sadness (Kleinman, 2004). One of the possible explanations for this phenomenon is that reporting physical distress is more acceptable than reporting psychological distress in Eastern countries as Eastern societies look down upon the mentally ill (Kleinman & Kleinman, 1985; Thakker & Ward, 1998). While there has been considerable research examining the reporting of symptoms, much less attention has been directed toward the cognitive processes underpinning

depression across cultures. Hence, this study investigated the association between depression and two cognitive processes, AM retrieval and SPS, from a cross-cultural perspective.

There is strong evidence that deficient AM retrieval is associated with depression (Williams & Broadbent, 1986; Brittlebank et al., 1993). People who suffer from depression retrieve significantly more categoric AMs, as well as fewer specific AMs than nondepressed people. For example, they offer an overgeneral AM “Playing squash on Fridays” instead of providing a specific response “Playing squash last Friday night” when requested to produce a specific AM to a cue word. Depressed people also perform less effectively on SPS tasks such as the MEPS than their nondepressed counterparts (Goddard et al., 1996; Marx et al., 1992). This poorer SPS performance has been found to be associated with the categoric AM retrieval during SPS process (Goddard et al., 1996).

Research also indicates that thinking style (i.e., rumination versus distraction) seems to be a mechanism underlying both cognitive deficits. Both dysphoric and depressed individuals who receive a rumination manipulation have poorer SPS performance than those individuals receiving a distraction manipulation (Lyubomirsky & Nolen-Hoeksema, 1995; Watkins & Baracaia, 2002; Donaldson & Lam, 2004; Watkins & Moulds, 2005; Raes et al., 2005). Lyubomirsky and Nolen-Hoeksema (1995) found that dysphoric people who received a rumination manipulation offered a lower percentage of solutions that were model solutions in response to the first situation. They also produced less effective solutions than the other three groups. The results also demonstrated that increased rumination was

associated with impaired SPS performance. Donaldson and Lam (2004) measured SPS performance prior to and after the rumination/distraction response induction and found that the depressed ruminators perform more poorly on the MEPS than the depressed distracters. Raes et al. (2005) also replicated this finding that rumination, impaired SPS and reduced AM specificity were associated. Especially, the Raes et al. (2005) study revealed that the association between rumination and poor SPS was mediated by reduced AM specificity. However, this conclusion was drawn from a correlation analysis. Thus a causal effect relationship has to be further examined.

There is some evidence that culture may play an important role in cognitive biases in depressed people. With respect to the AM retrieval, several findings with nondepressed samples have revealed that there are differences in AM retrieval between individuals from Eastern versus Western cultures (Wang, 2001; Wang, 2004; Wang & Conway, 2004). Individuals from a Western culture retrieve AMs with greater specific details and more emotional elaborations. The reason that leads to these cross-cultural differences might be a contrast between independent versus interdependent style between Western culture and Eastern culture. However, not much work to date has been done to look at AM differences in depressed people across different cultures. A cross-cultural comparison of the ability to retrieve AM was presented in Chapter 5 (Study 3), in both British and Taiwanese participants. The results revealed an interesting interaction between depression and culture. The British nondepressed participants retrieved more specific AMs and fewer categoric AMs than the Taiwanese nondepressed participants. In contrast, the depressed British and Taiwanese participants did not differ in the

number of categoric AMs produced. However, a greater depression score was associated with less categoric AMs in the Taiwanese depressed sample.

Although much work has been done to investigate SPS, it still remains unclear how culture may influence social problem-solving performance in people from different cultures (Chang, D’Zurilla & Sanna, 2004). Chang (1998) investigated the relationship between cultural influences, perfectionism, SPS, and subsequent suicidal risk in both Asian American and Caucasian American college students. The results indicated that SPS, rather than hopelessness, is an important predictor for suicidal potential, independent of ethnic status and perfectionism (Chang, 1998). Thus, across ethnic groups, poorer SPS is associated with increased suicidal ideas. It is worth mentioning that when examining the responses on the Social Problem Solving Inventory-Revised (SPSI-R; D’Zurilla et al., 2002), there was some evidence suggesting that cultural differences do exist for SPS ability. In Chang’s study (1998), the results also showed that Asian Americans scored significantly higher on the two subscales of SPSI-R; namely Negative Problem Orientation and Impulsivity/carelessness style. However, significant correlations were not found between these maladaptive SPS styles and the hopelessness tendency as well as increased suicidal risk in Asian Americans. Moreover, the Asian Americans also differed from the Caucasian Americans on several perfectionism dimensions such as the level of concern about making mistakes and caring more about parental expectations. In addition, Chang (2001) examined the association between SPSI-R, life satisfaction, and depressive symptoms between Caucasian Americans and Asian Americans. Compared to Caucasian Americans, Asian Americans scored significantly higher on one subscale of SPSI-R, the

Impulsivity/carelessness style. The Impulsivity/carelessness style is defined as taking action without considering the results caused. However, this deficit in problem solving style measured by SPSI-R was not associated significantly with either less satisfaction or greater depressive symptoms. Interestingly, Chang indicated that given these cultural differences, maladaptive SPS in Asian Americans is not necessarily associated with less positive psychological outcomes (e.g., life satisfaction, Chang, 2001). In sum, there is not really strong evidence to suggest that a culture differences exist in terms of SPS ability across different cultures. However, it should be pointed out that all these investigations have been based on self-report measures and thus there is a need to examine cross-cultural differences in SPS using a qualitative approach.

As rumination is indicated as a key process in AM retrieval and SPS, it is worth considering how culture impacts on this process. There is limited work looking at the effects of rumination (i.e., self-focused attention on the symptoms, feelings and thoughts) and distraction between different racial groups using self-report assessments of thinking style. Eshun, Chang and Owusu (1998) examined the role of culture as a potential moderator of gender differences in response to depression in students from Ghana and U. S. A. The participants were asked to complete the Responses Style Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991). The results showed a significant effect of culture on response styles. For example, Americans scored significantly higher than the Ghanaians on the Dangerous-activity and Ruminative subscales. In addition, there was a significant interaction between gender and culture for Dangerous-activity subscale in Americans, providing some evidence that the thinking styles associated with

depression (measured by RSQ) may differ cross-culturally. This study demonstrated a preliminary finding for cross-cultural differences in responses to depression in terms of rumination. However, more work needs to be done to further examine the cultural differences in depth in terms of thinking style, for example, the tendency to ruminate.

It seems possible that rumination may be associated with enhanced self-focus in terms of thinking about one's own failures. In view of evidence that Western individuals are characterized as having an independent view of self whilst Eastern individuals have an interdependent view of self, it is possible that a rumination manipulation promoting greater self-focus would have more effect in Western versus Eastern samples in terms of mood and cognitive processing on SPS and AM retrieval.

In conclusion, there is clear evidence that there is an association between rumination, SPS and AM retrieval in Western populations. Although there is independent evidence that culture may influence rumination, SPS or AM retrieval, no study has examined the interaction of these factors from a cross-cultural perspective. This study addresses this question in this chapter. In addition, the AMT cueing task will be used to establish baseline how culture influences AM performance prior to the manipulation.

6.2 Method

6.2.1 Design

The design was a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) between subjects design. The number of relevant means and the effectiveness on the MEPS task, as well as the AM retrieved during SPS served as the dependent measurements.

6.2.2 Participants

Thirty Taiwanese clinically depressed patients (Age: $M = 37.53$ years old, $SD = 10.08$ years old) were recruited from the Department of Psychiatry of the Chung-Shang Medical University Hospital. For the British group, thirty clinically depressed patients (Age: $M = 39.47$ years old, $SD = 7.42$ years old) were recruited from either the Affective Disorders Centre of Ninewells Hospital in Dundee or the Health Centre in St. Andrews.⁵ All the patients were interviewed to assess whether they met the diagnosis of Major Depressive Disorder according to DSM-IV criteria (APA, 1994). Participants were excluded if they had any manic episode because previous research (Ridout, 2004) has indicated they have a different cognitive profile from the patients with Major Depressive Disorder. Patients were also excluded if they had any previous psychotic symptoms or if the depressed symptoms were due to organic factors. Participants were tested individually in an interview room in the hospitals or within the School of Psychology, University of St. Andrews.

⁵ The British participants in this study are identical to the participants in Study 2.

Thirty nondepressed Taiwanese controls (Age: $M = 37.3$ years old, $SD = 9.16$ years old) were recruited from a local community society through an advertisement. Thirty British nondepressed participants (Age: $M = 39.33$ years old, $SD = 8.58$ years old) were recruited through advertisement, placed around St. Andrews. All the nondepressed participants were assessed using the SCID to ensure that they were neither currently suffering from Major Depressive Disorder nor currently experiencing any low mood.

The characteristics of age, years of education and BDI scores of each group are displayed in Table 6.1.

Table 6.1 Characteristics of participants in terms of age, years of education and the BDI scores

			Age	Years of education	BDI scores
British	NND	R	37.33 (9.52)	12.07 (3.31)	2.33 (1.18)
		D	41.33 (7.31)	10.67 (3.81)	2.73 (1.58)
	DPS	R	38.00 (7.99)	11.00 (2.78)	30.33 (4.27)
		D	40.93 (6.75)	10.93 (5.02)	30.80 (4.20)
Taiwanese	NND	R	35.33 (9.69)	11.13 (4.31)	2.73 (1.71)
		D	39.27 (8.46)	10.27 (4.82)	2.27 (1.54)
	DPS	R	39.40 (8.42)	8.93 (3.86)	28.60 (5.21)
		D	35.67 (11.49)	10.33 (4.35)	29.27 (7.37)

NND = Nondepressed
DPS = Depressed

R = Rumination
D = Distraction

To establish if the groups were equivalent in age, a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA on age was conducted to determine if the groups differed. There were no significant main effects of either culture ($F(1, 112) = 1.518, p > .05$), depressed status ($F(1, 112) = .013, p > .05$) or thinking style ($F(1, 112) = 1.228, p > .05$). The interaction between culture and depressed status ($F(1, 112) = 1.228, p > .05$), culture and thinking style ($F(1, 112) = 1.094, p > .05$), as well as the depressed status and thinking style were not significant ($F(1, 112) = 1.840, p > .05$). The interaction between culture, depressed status and thinking style was not significant ($F(1, 112) = 1.051, p > .05$) (see Table 6.1).

To establish if the groups were comparable in received years of education, a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA was conducted to determine if the groups differed in mean years of education. There were no significant main effects of either culture ($F(1, 112) = 1.791, p > .05$), depressed status ($F(1, 112) = .963, p > .05$) or thinking style ($F(1, 112) = .098, p > .05$). The interaction between culture and depressed status ($F(1, 112) = .199, p > .05$), culture and thinking style ($F(1, 112) = .448, p > .05$), as well as the depressed status and thinking style was not significant ($F(1, 112) = 1.451, p > .05$). The interaction between culture, depressed status and thinking style was not significant ($F(1, 112) = .098, p > .05$) (see Table 6.1).

To determine if the groups were equivalent in mood state, a 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking

style: rumination vs. distraction) ANOVA was conducted to determine if the groups differed in BDI scores. Only a significant main effect of depressed status was found ($F(1, 112) = 1407.568, p < .001$) such that the depressed group ($M = 29.75, SD = 5.35$) was significantly more depressed than the nondepressed group ($M = 2.52, SD = 1.49$). Neither a main effect of culture ($F(1, 112) = 1.318, p > .05$) nor of thinking style ($F(1, 112) = .135, p > .05$) was found. No interaction between culture and depressed status ($F(1, 112) = 1.215, p > .05$), culture and thinking style ($F(1, 112) = .053, p > .05$), depressed status and thinking style ($F(1, 112) = .171, p > .05$), as well as culture, depressed status and thinking style ($F(1, 112) = .135, p > .05$) were found (see Table 6.1).

6.2.3 Materials

6.2.3.1 Beck Depression Inventory (BDI; Beck et al., 1961)

The BDI (Beck et al., 1961) is a 21-item self-reported inventory measuring the degree of depressed symptoms occurring over the past 2 weeks (see Appendix 1). The 21-item inventory focuses on various aspects of depressed symptoms, which include subjective mood state, feelings of self-esteem, propensity to initiate action, motivation for completing tasks, as well as the quality of sleep and appetite.

The BDI, Mandarin-Chinese version was translated by Ko in 1991 from the BDI (cf. Wang, 2001). The Cronbach's Alpha was .87 and the split-half reliability was .84, which has been corrected using the Spearman-Brown prophecy formula for the BDI Mandarin-Chinese version (cf. Wang, 2001).

6.2.3.2 Mood Questionnaires

Participants completed three identical packets of mood questionnaires during the experiment (see Appendix 2). Each packet contained questionnaires that asked participants to rate their current mood state on 9-point Likert-type scales (e.g., 1 = *not at all cheerful*; 9 = *extremely cheerful*). The mood questionnaires were administered at the outset of the experiment to obtain the initial mood state and then right after each thinking style manipulation to measure the impact of the manipulation on their mood states.

6.2.3.3 Autobiographical Memory Test (AMT; Williams & Broadbent, 1986)

The AMT requested the participants to retrieve a specific AM as quickly as possible to a cue word (see Appendix 3). Ten cue words were used which consisted of five positive words (i.e., happy, safe, interested, successful, and surprised) and five negative words (i.e., sorry, angry, clumsy, hurt, and lonely). These words were presented orally and visually to the participants in this order, with positive and negative words alternating. Participants were required to retrieve a specific AM as quickly as possible to each cue word. A maximum of 60 seconds was given to retrieve a AM to each cue word. If a response was not given in that time, a score of 60 seconds was recorded and the next word was presented. The responses were scored for the specificity of the participants' first response. A tape recorder was used to record all the responses.

6.2.3.4 Thinking Style Manipulation (Rumination versus Distraction)

The original response-manipulation tasks were designed to influence the content of participants' thoughts by requiring them to focus their attention and "think about" a series of 45 items (Lyubomirsky et al., 1998). This task was adapted by Watkins (2000) from the tasks used by Nolen-Hoeksema and Morrow (1993), with items adjusted for British participants (see Appendices 4 & 5). Following Nolen-Hoeksema's (1991) definition of ruminative responses, the ruminative condition instructs participants to focus their attention on thoughts that are emotion focused, symptom focused, and self-focused, although they are not told especially to think about negative emotions and negative personal attributes. For example, participants are asked to think about "your current level of energy", "why your body feels this way", "trying to understand your feelings", "your character and who you strive to be", and "why you turned out this way". In contrast, participants in the distraction condition focus their attention on the thoughts that are externally focused and not related to symptoms, emotions, and the self. For example, they are asked to think about "clouds forming in the sky", "the expression on the face of the Mona Lisa," and "the shiny surface of a trumpet."

In previous work using this response-manipulation task, participants spent exactly 8 minutes focusing on the items. In our current study, we decided to administer the manipulation in two blocks because we were concerned that the effect of the manipulation might fade whilst participants are trying to solve all four problems. Thus one half of the rumination/distraction manipulation (23 items) was administered before the first two SPS tasks were presented. The remaining

half of the thinking style manipulation task (22 items) was then administered before the final two SPS tasks were presented. Thus the participants spent 4 minutes on the thinking style manipulation task in each block. The items were printed each on a single card, which was handed to the participants one at a time. During each manipulation, participants were instructed to focus their mind on each item and think about each idea.

6.2.3.5 Means-Ends Problem-Solving Procedures (MEPS; Platt & Spivack, 1975a)

In this experiment, four hypothetical problems from the MEPS tasks are used to assess participants' problem solving ability (see Appendix 6). The MEPS is a hypothetical SPS task and consists of 10 vignettes that first describe a problem situation and then the resolution of that problem situation. Problems revolve around social themes such as:

“You notice that your friends seem to be avoiding you. You want to have friends and to be liked. The story ends when your friends like you again. You begin where you first notice your friends avoiding you.”

Respondents are required to describe the actions needed to be taken so that the conclusion may be reached effectively. Platt and Spivack (1975b) showed that it is not necessary to administer all 10 vignettes. In this study four vignettes were used that covered the following areas: problem with a boss/teacher, being teased by friends, moving to a new neighborhood, and argument with partner/parents. An

example was presented before beginning the actual experiment to make sure that participants understood the instructions completely. Following each MEPS task, the participants were asked to write down any thoughts or images that crossed their mind whilst trying to solve this social problem.

Responses were marked for relevant means according to the criteria determined by Platt and Spivack (1975) and for effectiveness according to the rating used by Marx et al. (1992). The means measure was the number of the steps to solve the hypothetical problems. The effectiveness measure was marked on a Likert-type scale ranging from 1 (*not at all effective*) to 7 (*very effective*) for each problem. Scores were summed across the four problems to give each respondent a total effectiveness score and a means score. In considering that the effective strategies to solve a social problem in one country is not necessarily as effective as those in another country, the ratings of the effectiveness score were done independently by the raters who are from the same culture as the participants are from.

6.2.3.6 Cultural Equivalent Consideration

Translation and back-translation were carried out to ensure that the two versions of experimental materials of each language were literally and semantically equivalent.

To ensure that two different versions of the AMT cueing task were identical in their semantic meanings, a Mandarin-Chinese equivalent of the AMT cueing task

was developed which consisted of word cues that were identical in their semantic meaning. To develop the Mandarin-Chinese version of the AMT cueing task, the Academia Sinica Bilingual Ontological Wordnet was employed. This programme provides an exact translation of the word meanings from Chinese to English as well as from English to Chinese, while also matching on word frequency.

The mood questionnaires were also translated into Mandarin-Chinese version and back translation was administered to ensure that these two mood-measuring materials were identical in their semantic meanings.

The MEPS (Platt & Spivack, 1975a) and the rumination/distraction thinking style task (Lyubomirsky et al., 1998) were translated into Mandarin-Chinese version by a native Chinese-speaking student in the Department of English. A back translation was performed by a Chinese-English bilingual student in Psychology and a clinical psychologist in Taiwan. The back-translation was compared to the original version by two native English-speaking psychology PhD students on a 7-point Likert-type scale (1 = *totally incorrect*, 7 = *completely correct*). The back-translation was rated a 6 by one person and a 7 by the other on the four measures of the MEPS as well as both rated a 6 on the 45 items of rumination/distraction thinking style task.

6.2.4 Procedure

The study conducted in Taiwan received ethical approval from the Institutional Review Board, Chung Shan University Hospital. The study in the U.K. received

ethical approval from the Tayside Committee on Medical Research Ethics and extended to Fife area by Fife NHS Board, Local Research Ethics Committee.

Participants were informed that the study was examining the relationship between the processes of imagination, dreaming, levels of consciousness and cognition. This provided a cover story designed to minimize possible demand characteristics.

In the beginning, the participants were given the first self-report mood questionnaire to assess their baseline mood state. Then, the BDI was used to assess their mood state to allocate participants. A word-generating task was administered immediately after the BDI, which required participants to write down as many words as possible that began with an “S” in 90 seconds. This task was designed to eliminate the possible ruminating effects that were created by completing the BDI.

A questionnaire about imaging colors, and a questionnaire on dreaming was then given to the participants. These two questionnaires were included as filler tasks to prevent participants from guessing the purpose of the study or the link between the response manipulation task and social problem solving tasks (see Appendix 6). The AMT cueing task was then administered.

In the AMT cueing task, the participants were asked to retrieve a specific AM in response to 10 (5 positive and 5 negative) emotional cue words, which are orally and visually presented with positive and negative words alternating. Their

responses were categorized as specific memory, extended general memory, and categoric general memory. The definitions for these memories are explained in Chapter 2. After completing the AMT cueing task, participants were administered either the rumination or the distraction manipulation. In the rumination/distraction manipulation, participants in the rumination condition focused their attention on items that are symptom-focused, emotion-focused, and self-focused, whereas in the distraction condition, they focused their attention on the items that are externally focused. Thus, in each condition of the manipulation, participants concentrated on 23 items for 4 minutes. Following the manipulation, the participants completed a self-report measure of mood. Then, two hypothetical social problems selected from the MEPS and their happy endings were presented to the participants. The participants were asked to list the steps that were required to reach the happy ending to the hypothetical social-problems. Next the participants concentrated on the remaining 22 items in the response-manipulation task for four minutes before solving two further social problems from the MEPS. The order of presentation for the four MEPS problems was randomized across participants. For the Taiwanese participants, the inter-rater reliability for the means and effectiveness scores on the MEPS were .84 (for means) and .82 (for effectiveness) respectively, based on 15 participants. The inter-rater reliability for the British participants can be seen in Chapter 4, Section 4.2.4.

After responding to each social problem, the participants were asked to write down any thoughts or images that crossed their mind whilst trying to solving the social problems. Their responses were categorized according to the following criteria: specific memory, extended general memory, categoric general memory,

and general knowledge concerning the problem.

According to previous research, the mood of the dysphoric/depressed individuals becomes worse after receiving the rumination manipulation. To address this ethical consideration, a number of distraction items were given to the dysphoric/depressed ruminators at the end of the experiments involving the rumination manipulation. These distraction items should have eliminated the negative effect on mood caused by the rumination manipulation.

The participants were debriefed at the end of the study. The whole test session took less than one hour.

6.3 Results

6.3.1 Manipulation Check

The manipulation check of mood rating was examined in the British (see Table 6.2) and the Taiwanese groups (see Table 6.2) separately as follows

Firstly, as can be seen in Table 6.2 above, at the beginning of the study, the British depressed participants reported greater depressed mood than the British nondepressed participants. A Pearson's correlation was conducted to examine the association between participants' BDI score and their self-report mood measure and a satisfactory positive correlation was found ($r = 0.68, p < 0.01$). Baseline mean levels of depressed mood of each group were as follows: nondepressed

rumination group, 9.80 ($SD = 3.00$); nondepressed distraction group, 9.27 ($SD = 1.91$); depressed rumination group, 26.27 ($SD = 2.28$); depressed distraction group, 27.87 ($SD = 2.90$).

Table 6.2 Mean and SD of Levels of Mood of British Group (Depressed Status \times Thinking Style)

	British Nondepressed		British Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Mood 1				
M	9.80	9.27	26.27	27.87
(SD)	(3.00)	(1.97)	(2.28)	(2.90)
Mood 2				
M	9.73	8.93	28.60	19.87
(SD)	(2.96)	(1.79)	(3.20)	(3.50)
Mood 3				
M	9.53	8.80	29.00	19.40
(SD)	(2.95)	(1.97)	(3.84)	(3.50)

Mood 1: At the beginning of the experiment

Mood 2: After the first time manipulation

Mood 3: After the second time manipulation

Group differences in baseline mood were assessed in a 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA with baseline mood rating measured by 9-point Likert-type scale ratings, as the dependent variable. There was a main effect of depressed status ($F(1, 56) = 701.714, p < .001$); depressed participants had higher levels of depressed mood at the outset of the experiment ($M = 27.07, SD = 2.69$) than nondepressed participants ($M = 9.53, SD = 2.49$). There were no differences in baseline depressed mood rating between the rumination and the distraction thinking style conditions ($F(1, 56) = .649, p > .05$). The interaction between depressed status and thinking style was also not significant ($F(1, 56) = 2.597, p > .05$) (see Table 6.2).

Mean levels of mood rating after the first time rumination/distraction manipulation were as follows: nondepressed rumination group, 9.73 ($SD = 2.96$); nondepressed distraction group, 8.93 ($SD = 1.79$); depressed rumination group, 28.60 ($SD = 3.20$); depressed distraction group, 19.87 ($SD = 3.50$). A 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANCOVA (analysis of covariance, with baseline mood as the covariance) was conducted to assess the effects of the rumination/distraction manipulation on post manipulation depressed mood. The results of the analysis of covariance demonstrated a main effect of thinking style ($F(1, 56) = 65.845, p < .001$). There was a depressed status \times thinking style interaction ($F(1, 56) = 52.962, p < .001$), explained group differences in terms of the mood 2 of the participants in the depressed rumination group being significantly worse than the mood 2 of the participants in the depressed distraction group ($t(28) = 7.127, p < .001$). The depressed ruminators also demonstrated worse mood than the nondepressed ruminators ($t(28) = 16.747, p < .001$) and nondepressed distracters ($t(28) = 20.756, p < .001$) (see Table 6.2).

To address concerns that the effect of the rumination/distraction manipulation might not persist over time, the manipulation was repeated once the first two SPS tasks were completed. Then participants were asked to complete the self-report measure of mood again. The results of paired samples t tests revealed that after the second rumination/distraction manipulation, the mood rating (Mood 3) remained very similar to the rating made after the first response manipulation (Mood 2) for all four groups in the study (all $t(14) < .90, p > .05$).

Secondly, as can be seen in Table 6.3 above, at the beginning of the study, the Taiwanese depressed participants reported greater depressed mood than the Taiwanese nondepressed participants. A Pearson's correlation was conducted to examine the association between participants' BDI score and their self-report mood measure and a satisfactory positive correlation was found, $r = .894, p < .01$. Baseline mean levels of depressed mood of each group were as follows: nondepressed rumination group, 8.46 ($SD = 2.45$); nondepressed distraction group, 8.93 ($SD = 1.71$); depressed rumination group, 21.53 ($SD = 2.50$); depressed distraction group, 22.40 ($SD = 2.23$).

Table 6.3 Mean and SD of Levels of Mood of Taiwanese Group (Depressed Status \times Thinking Style)

	Taiwanese Nondepressed		Taiwanese Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Mood 1				
M	8.46	8.93	21.53	22.40
(SD)	(2.45)	(1.71)	(2.50)	(2.23)
Mood 2				
M	8.60	8.73	22.73	19.07
(SD)	(2.26)	(2.09)	(2.43)	(2.25)
Mood 3				
M	9.00	8.80	24.13	18.26
(SD)	(2.72)	(2.31)	(1.85)	(2.15)

Mood 1: At the beginning of the experiment

Mood 2: After the first time manipulation

Mood 3: After the second time manipulation

Group differences in baseline mood were assessed in a 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA with baseline mood rating measured by 9-point Likert-type scale ratings, as the dependent variable. There was a main effect of depressed status ($F(1, 56) = 524.269, p < .001$); depressed participants had higher levels of depressed mood at

the outset of the experiment ($M = 21.97$, $SD = 2.37$) than nondepressed participants ($M = 8.70$, $SD = 2.09$). There were no differences in baseline depressed mood rating between the ruminative and distracting thinking style conditions ($F(1, 56) = 1.324$, $p > .05$). The interaction between depressed status and thinking style was also not significant ($F(1, 56) = .119$, $p > .05$) (see Table 6.3).

Mean levels of mood rating after the first time rumination/distraction manipulation were as follows: nondepressed rumination group, 8.60 ($SD = 2.26$); nondepressed distraction group, 8.73 ($SD = 2.09$); depressed rumination group, 22.73 ($SD = 2.43$); depressed distraction group, 19.07 ($SD = 2.25$). A 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANCOVA (analysis of covariance, with baseline mood as the covariance) was conducted to assess the effects of the rumination/distraction manipulation on post manipulation depressed mood. The results of analysis of covariance demonstrated a main effect of thinking style ($F(1, 56) = 34.187$, $p < .001$). The depressed status \times thinking style interaction ($F(1, 56) = 28.415$, $p < .001$), explained group differences in terms of mood 2 of the participants in depressed rumination group were significantly worse than mood 2 of the participants in depressed distraction group ($t(28) = 4.284$, $p < .001$). The depressed ruminators also demonstrated worse mood than the nondepressed ruminators ($t(28) = 16.476$, $p < .001$) and nondepressed distracters ($t(28) = 16.914$, $p < .001$) (see Table 6.3).

To address concerns that the effect of the rumination/distraction manipulation might not persist over time, the manipulation was repeated once the first two SPS

tasks were completed. Then the participants were asked to complete the self-report measure of mood again. The results of paired samples t tests revealed that after the second rumination/distraction manipulation, the mood rating (Mood 3) remained very similar to the rating made after the first response manipulation (Mood 2) for all four groups in the study (all $t(14) < 2.00, p > .05$).

6.3.2 AM Retrieval on the AMT Cueing Task

Specific Memory

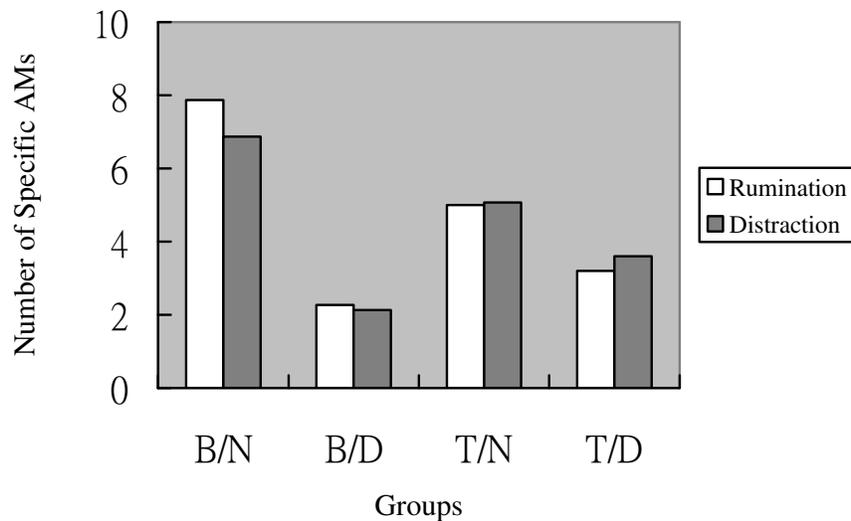
A 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA was conducted on the numbers of specific AMs retrieved on the AMT cueing task. The results revealed that there was a significant main effect of culture ($F(1, 112) = 4.794, p < .05$), such that the British participants ($M = 4.78, SD = 2.87$) retrieved significantly more specific AMs than the Taiwanese participants ($M = 4.22, SD = 1.79$). Also a main effect of depressed status was found ($F(1, 112) = 172.578, p < .001$) such that the depressed participants ($M = 2.80, SD = 1.40$) retrieved significantly less specific AMs on the AMT cueing task than the nondepressed participants ($M = 6.20, SD = 1.94$). However, there was no significant main effect of thinking style ($F(1, 112) = 0.415, p > .05$) (see Table 6.4).

Furthermore, there was also a two-way interaction between culture and depressed status ($F(1, 112) = 46.595, p < .001$), which explained group differences that the British nondepressed participants ($M = 7.37, SD = 1.38$)

produced significantly more specific AMs than the nondepressed Taiwanese participants ($M = 3.93, SD = 1.91$) ($t(58) = 5.818, p < .001$). Moreover, the British depressed participants ($M = 2.20, SD = 1.03$) produced significantly less specific AMs than Taiwanese depressed participants ($M = 3.40, SD = 1.48$) ($t(58) = -3.651, p < .01$). There was no significant culture \times thinking style interaction ($F(1, 112) = 2.389, p > .05$), depressed status \times thinking style interaction, $F(1, 112) = 1.344, p > .05$, nor culture \times depressed status \times thinking style interaction ($F(1, 112) = 0.265, p > .05$) (see Table 6.4).

Table 6.4 Specific AM Retrieval on the AMT (Culture \times Depressed Status)

	British				Taiwanese			
	Nondepressed		Depressed		Nondepressed		Depressed	
	R(15)	D(15)	R(15)	D(15)	R(15)	D(15)	R(15)	D(15)
Specific	7.87 (1.19)	6.87 (1.41)	2.27 (0.88)	2.13 (1.18)	5.00 (1.51)	5.07 (1.94)	3.20 (1.08)	3.60 (1.80)
Categoric	1.27 (0.88)	1.80 (0.94)	6.80 (1.61)	6.93 (1.75)	3.87 (2.10)	4.00 (1.77)	6.27 (1.22)	5.20 (1.82)



B/N: British Nondepressed
B/D: British Depressed

T/N: Taiwanese Nondepressed
T/D: Taiwanese Depressed

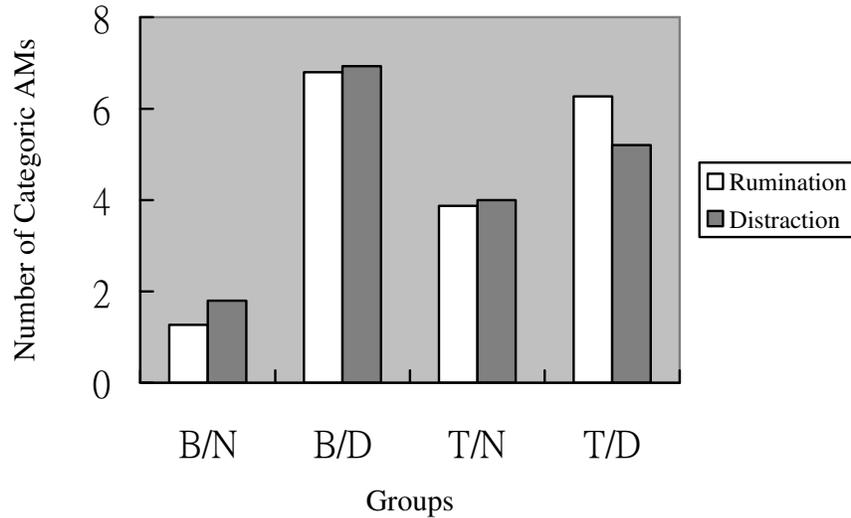
Figure 6.1 Specific AM Retrieval on the AMT

Categoric Memory

A 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA was also conducted on the numbers of categoric AMs on the AMT cueing task. The results revealed that there was a significant main effect of culture ($F(1, 112) = 4.888, p < .05$), such that the British participants ($M = 4.20, SD = 3.00$) retrieved significantly less categoric AMs than the Taiwanese participants ($M = 4.83, SD = 1.98$). Also a main effect of depressed status was found ($F(1, 112) = 155.015, p < .001$) such that the depressed participants ($M = 6.30, SD = 1.72$) retrieved significantly more categoric AMs on a AMT cueing task than the nondepressed participants ($M = 2.73, SD = 1.92$). However, there was no significant main effect of thinking style ($F(1, 112) = .054, p > .05$) (see Table 6.4).

There was a significant culture \times depressed status interaction ($F(1, 112) = 38.033, p < .001$). The interaction was explained by group differences in terms of number of categoric AMs offered by the British nondepressed participants ($M = 1.53, SD = 0.94$) being significantly less than those offered by the Taiwanese nondepressed participants ($M = 3.93, SD = 1.91$) ($t(58) = -6.177, p < .001$). Moreover, the British depressed participants ($M = 6.87, SD = 1.66$) also provided significantly more categoric AMs than the Taiwanese depressed participants ($M = 5.73, SD = 1.62$) ($t(58) = 2.682, p < .05$). However, there were no significant culture \times thinking style interaction ($F(1, 112) = 1.950, p > .05$), depressed status \times thinking style interaction, $F(1, 112) = 1.950, p > .05$, and culture \times depressed

status × thinking style interaction ($F(1, 112) = .487, p > .05$) (see Table 6.4).



B/N: British Nondepressed

T/N: Taiwanese Nondepressed

B/D: British Depressed

T/D: Taiwanese Depressed

Figure 6.2 Categorical AM Retrieval on the AMT

6.3.3 Association between the BDI Score and AM Retrieval on the AMT

Cueing Task

Firstly, Pearson Correlation was carried out to examine the association between memory retrievals on the AMT cueing task and the BDI scores. A significant negative correlation was found between the specific AM retrieval and their BDI scores in the total sample of 120 participants ($r = -.67, p < .01$). Also a significant positive correlation was found between the categoric AM retrieval and their BDI scores in the total sample of 120 participants ($r = .73, p < .01$).

When looking at the correlation between BDI score and AM retrieval on the AMT cueing task across the two countries, there was a significantly negative

correlation between the BDI score and number of specific AM retrieval in both British and Taiwanese participants respectively ($r = -.907, p < .05$; $r = -.462, p < .05$). Moreover, a significantly positive correlation was also found between the BDI score and number of categoric AMs retrieved in both British and Taiwanese groups ($r = .888, p < .05$; $r = .469, p < .05$)

However, after dividing the participants into four groups (i.e., British/Taiwanese versus depressed/nondepressed), only a significant negative correlation was found such that the British nondepressed participants retrieved significantly less specific AMs if they scored higher on the BDI ($r = -.595, p < .05$) (see Table 6.5).

Table 6.5 Correlation between the BDI Scores and AM Retrieval on the AMT

	British		Taiwanese	
	Nondepressed (n = 30)	Depressed (n = 30)	Nondepressed (n = 30)	Depressed (n = 30)
Specific Memory	-.595*	-.132	-.094	-.112
Categoric Memory	-.147	.186	.179	.134

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

6.3.4 The Effects of Rumination/Distraction on SPS Performance in terms of Means and Effectiveness

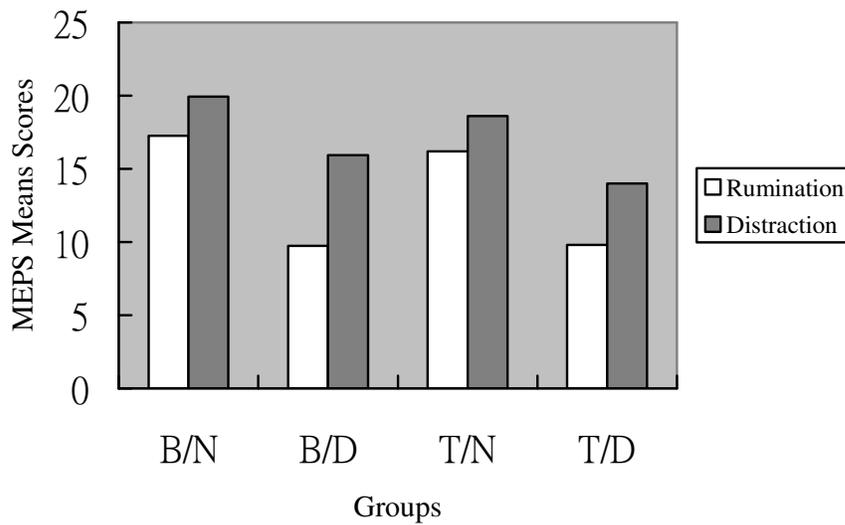
Table 6.6 and Table 6.7 display the means and SDs of the two MEPS measures in each group. The patterns were verified with two $2 \times 2 \times 2$ ANOVAs.

Table 6.6 MEPS Means Scores (Culture × Depressed Status)

	British		Taiwanese	
	Nondepressed	Depressed	Nondepressed	Depressed
Rumination	17.27 (3.03)	9.73 (2.02)	16.20 (5.49)	9.80 (3.08)
Distraction	19.13 (3.96)	15.93 (3.53)	18.60 (3.91)	14.00 (5.36)

A 2 (culture: British vs. Taiwanese) × 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVA was conducted on the MEPS means scores. The results revealed that there was a significant main effect of depressed status ($F(1, 112) = 56.650, p < .001$). Also a main effect of thinking style was found ($F(1, 112) = 25.800, p < .001$). However, there was no significant main effect of culture ($F(1, 112) = 1.441, p > .05$) (see Table 6.6).

Furthermore, there was a two-way interaction between depressed status × thinking style ($F(1, 112) = 4.512, p < .05$). The interaction was explained by group differences in terms of number of relevant means offered by nondepressed ruminators ($M = 16.73, SD = 4.39$) significantly more than those offered by depressed ruminators ($M = 9.77, SD = 2.56$) ($t(58) = 7.507, p < .001$). The depressed ruminators also provided significantly less relevant means than the depressed distracters ($t(58) = 5.442, p < .01$) as well as the nondepressed distracters ($t(58) = 10.738, p < .001$). However, there were no significant culture × depressed status interaction ($F(1, 112) = .009, p > .05$), culture × thinking style interaction ($F(1, 112) = .258, p > .05$), nor culture × depressed status × thinking style interaction ($F(1, 112) = .770, p > .05$) (see Table 6.6).



B/N: British Nondepressed
 B/D: British Depressed

T/N: Taiwanese Nondepressed
 T/D: Taiwanese Depressed

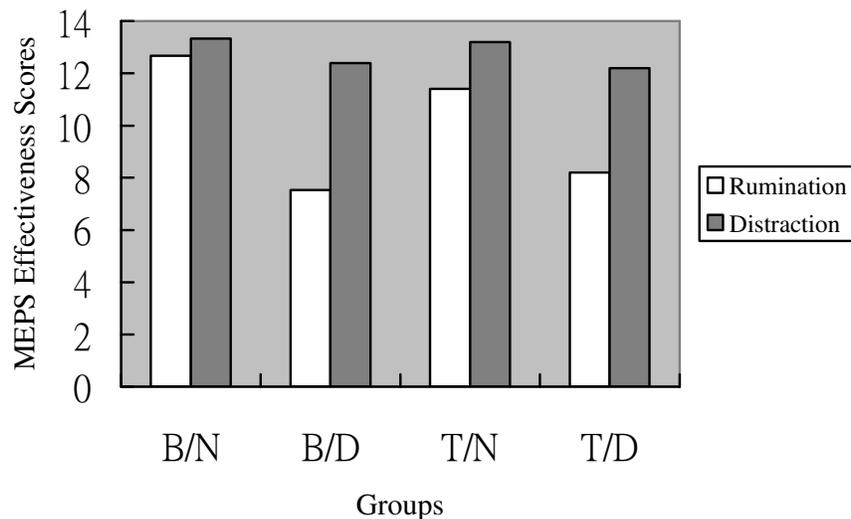
Figure 6.3 SPS in terms of Relevant Means

Table 6.7 MEPS Effectiveness Scores (Culture × Depressed Status)

	British		Taiwanese	
	Nondepressed	Depressed	Nondepressed	Depressed
Rumination	12.67 (2.92)	7.53 (1.85)	11.40 (4.42)	8.20 (2.14)
Distraction	13.33 (3.33)	12.40 (3.50)	13.20 (4.26)	12.20 (4.55)

A 2 (culture: British vs. Taiwanese) × 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVA was also conducted. The results revealed that there was a significant main effect of depressed status ($F(1, 112) = 16.077, p < .001$). Also a main effect of thinking style was found ($F(1, 112) = 19.591, p < .001$). However, there was no significant main effect of culture ($F(1, 112) = .133, p > .05$) (see Table 6.7).

Furthermore, there was a two-way interaction between depressed status \times thinking style ($F(1, 112) = 6.248, p < .05$), explained group differences in terms of effectiveness where nondepressed ruminators ($M = 12.03, SD = 3.74$) significantly better than depressed ruminators ($M = 7.87, SD = 1.99$) ($t(58) = 5.387, p < .001$). The depressed ruminators also provided significantly less effective solutions than the depressed distracters ($t(58) = 5.440, p < .01$) as well as the nondepressed distracters ($t(58) = 6.949, p < .01$). However, there were no significant culture \times depressed status interaction ($F(1, 112) = .531, p > .05$), culture \times thinking style interaction ($F(1, 112) = .011, p > .05$), or culture \times depressed status \times thinking style interaction ($F(1, 112) = .610, p > .05$) (see Table 6.7).



B/N: British Nondepressed
 B/D: British Depressed

T/N: Taiwanese Nondepressed
 T/D: Taiwanese Depressed

Figure 6.4 SPS in terms of Effectiveness

6.3.5 The Effects of Rumination/Distractor on AM retrieval during SPS

Table 6.8 and Table 6.9 display the means and SDs of the specific AM retrieval and categoric AM retrieval during SPS in each group. The patterns were verified with two $2 \times 2 \times 2$ ANOVAs.

Table 6.8 Specific AM Retrieval during SPS in British and Taiwanese Groups (Culture \times Depressed Status)

	British		Taiwanese	
	Nondepressed	Depressed	Nondepressed	Depressed
Rumination	1.87 (0.74)	1.13 (0.64)	2.00 (0.93)	1.27 (0.70)
Distraction	2.40 (1.06)	1.73 (0.59)	2.20 (0.56)	1.93 (1.03)

A 2 (culture: British vs. Taiwanese) \times 2 (depressed status: nondepressed vs. depressed) \times 2 (thinking style: rumination vs. distraction) ANOVA was also conducted on the numbers of specific AMs retrieved during SPS. The results revealed that there was a significant main effect of depressed status ($F(1, 112) = 16.738, p < .001$), such that the depressed participants ($M = 1.52, SD = 0.81$) retrieved significantly fewer specific AMs during SPS than the nondepressed participants ($M = 2.12, SD = 0.85$). Also a main effect of thinking style was found ($F(1, 112) = 11.624, p < .01$) such that the distracters ($M = 2.07, SD = 0.86$) retrieved significantly more specific AMs than the ruminators ($M = 1.57, SD = 0.83$). However, there was no significant main effect of culture ($F(1, 112) = .207, p > .05$) (see Table 6.8).

There was no significant culture \times depressed status interaction ($F(1, 112) = .465, p > .05$), culture \times thinking style interaction ($F(1, 112) = .207, p > .05$), depressed status \times thinking style interaction ($F(1, 112) = .827, p > .05$), or culture

× depressed status × thinking style interaction ($F(1, 112) = .465, p > .05$) (see Table 6.8).

Table 6.9 Categorical AM Retrieval during SPS in British and Taiwanese Groups (Culture × Depressed Status)

	British		Taiwanese	
	Nondepressed	Depressed	Nondepressed	Depressed
Rumination	1.67 (0.82)	2.40 (0.91)	1.77 (0.83)	2.47 (0.83)
Distraction	1.00 (1.13)	1.93 (0.71)	1.33 (0.82)	1.73 (1.03)

A 2 (culture: British vs. Taiwanese) × 2 (depressed status: nondepressed vs. depressed) × 2 (thinking style: rumination vs. distraction) ANOVA was also conducted on the numbers of categorical AMs during SPS. The results revealed that there was a significant main effect of depressed status ($F(1, 112) = 19.347, p < .001$), such that the depressed participants ($M = 2.13, SD = 0.91$) retrieved significantly more categorical AMs during SPS than the nondepressed participants ($M = 1.42, SD = 0.93$). Also a main effect of thinking style was found ($F(1, 112) = 11.395, p < .01$.) such that the ruminators ($M = 2.05, SD = 0.91$) retrieved significantly more categorical AMs than the distracters ($M = 1.50, SD = 0.98$). Moreover, there were no significant main effect of culture ($F(1, 112) = .094, p > .05$) (see Table 6.9).

There was no significant culture × depressed status interaction ($F(1, 112) = .513, p > .05$), culture × thinking style interaction ($F(1, 112) = .010, p > .05$), depressed status × thinking style interaction, ($F(1, 112) = .094, p > .05$), or

culture \times depressed status \times thinking style interaction ($F(1, 112) = .848, p > .05$) (see Table 6.9).

6.3.6 Association between SPS Performance and the AM Retrieval during SPS

Firstly, a correlation between SPS performance (in terms of means and effectiveness) and AM retrieval during SPS was examined in the total sample of 120 participants. A significant positive correlation between specific AM retrieval during SPS and SPS performance was found (MEPS means score: $r = .693, p < .01$ for; MEPS effectiveness score: $r = .516, p < .01$). There was also a significant negative correlation between categoric AM retrieval during SPS and SPS performance (MEPS means score: $r = -.566, p < .01$; MEPS effectiveness score: $r = -.500, p < .01$).

Next examining the association between SPS performance and AM retrieval during SPS according to country. Consider first the results of the British participants on the means measure. In all four groups (the nondepressed ruminators, the nondepressed distracters, the depressed ruminators, the depressed distracters) there was positive correlation between the number of specific AMs retrieved and the means scores (the nondepressed distracters: $r = .550, p < .05$, 1-tailed; the depressed ruminators: $r = .694, p < .01$, 1-tailed; the depressed distracters: $r = .536, p < .05$, 1-tailed). A less consistent pattern emerged for categoric AM retrieval during SPS. Only in the depressed ruminators a negative correlation was found between the MEPS means scores and the number of

categoric AMs retrieved ($r = -.599, p < .01, 1\text{-tailed}$) (see Table 6.10).

For the effectiveness measure, a less consistent profile was observed across all British groups in that specific AM retrieval was positively associated with higher effectiveness scores (the nondepressed ruminators: $r = .472, p < .05, 1\text{-tailed}$; the depressed distracters: $r = .639, p < .01, 1\text{-tailed}$). In the two British groups, the British nondepressed ruminators and the depressed ruminators, there was a significant negative correlation found between greater categoric AM retrieval and lower effectiveness scores (the nondepressed ruminators: $r = -.439, p = .051, 1\text{-tailed}$; the depressed distracters: $r = -.518, p < .05$) (see Table 6.10).

For the Taiwanese participants, all groups again demonstrated a positive correlation between specific AM retrieval during SPS and the means produced during SPS (the nondepressed ruminators: $r = .885, p < .01, 1\text{-tailed}$; the nondepressed distracters: $r = .561, p < .05, 1\text{-tailed}$; the depressed ruminators: $r = .554, p < .01, 1\text{-tailed}$; the depressed distracters: $r = .658, p < .05, 1\text{-tailed}$). For the effectiveness measure, the pattern was less consistent with only the Taiwanese nondepressed ruminators and the Taiwanese depressed ruminators showing a positive correlation between specific AM retrieval during SPS and greater effectiveness scores (the nondepressed ruminators: $r = .733, p < .01, 1\text{-tailed}$; the depressed ruminators: $r = .530, p < .05, 1\text{-tailed}$). For categoric AM retrieval during SPS, the Taiwanese nondepressed ruminators and the Taiwanese depressed distracters produced a negative correlation between the MEPS means score and number of categoric AMs retrieved during SPS (the nondepressed ruminators: $r = -.764, p < .01, 1\text{-tailed}$; the depressed distracters: $r = -.632, p < .01,$

1-tailed). Similarly on the effectiveness measure, the Taiwanese nondepressed ruminators and the Taiwanese depressed ruminators showed a negative correlation between the effectiveness scores and numbers of categoric memories retrieved (the nondepressed ruminators: $r = -.732$, $p < .01$, 1-tailed; the depressed ruminators: $r = -.495$, $p < .05$, 1-tailed) (see Table 6.11).

Table 6.10 Correlation between SPS and AM Retrieval during SPS (1-tailed) in British Group (Depressed Status \times Thinking Style)

	British Nondepressed		British Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
MEPS Means score	.270	.550*	.694**	.536*
MEPS Effectiveness score	.472*	.102	.359	.639**
Categoric Memory				
MEPS Means score	-.038	-.334	-.599**	-.088
MEPS Effectiveness score	-.439(.051)	.038	-.518*	-.365

** Correlation is significant at the .01 level (1-tailed).

* Correlation is significant at the .05 level (1-tailed).

Table 6.11 Correlation between SPS and AM Retrieval during SPS (1-tailed) in Taiwanese Group (Depressed Status \times Thinking Style)

	Taiwanese Nondepressed		Taiwanese Depressed	
	Rumination (n = 15)	Distraction (n = 15)	Rumination (n = 15)	Distraction (n = 15)
Specific Memory				
MEPS Means score	.885**	.561*	.554*	.658**
MEPS Effectiveness score	.733**	.311	.530*	.216
Categoric Memory				
MEPS Means score	-.764**	-.403	-.267	-.632**
MEPS Effectiveness score	-.732**	-.308	-.495*	-.428

** Correlation is significant at the .01 level (1-tailed).

* Correlation is significant at the .05 level (1-tailed).

6.4 Discussion

The aim of the present study was to examine how culture influences the

effects of thinking style (rumination versus distraction) on SPS performance and AM retrieval during SPS process in clinically depressed patients and nondepressed controls. In addition, a baseline measure of AMT cueing task performance was obtained in order to establish how culture would influence AMT cueing task performance prior to the rumination manipulation.

First consider performance on the AMT that served as the baseline measure of AM performance. The results revealed that depressed patients in both Taiwan and Britain had more impaired AM retrieval on the AMT cueing task than their nondepressed counterparts, as hypothesized. This finding is consistent with previous research (Williams & Dritschel, 1988; Goddard et al., 1996) and the results of a cross-cultural comparison of AM retrieval on the AMT cueing task described in Chapter 5.

Furthermore, a culture by depressed status interaction was found such that the British nondepressed participants retrieved more specific AMs as well as less categoric AMs than the Taiwanese nondepressed participants. This finding was also replicated in the first cross-cultural study in Chapter 5. It seems that the Taiwanese nondepressed participants employed a more overgeneral AM retrieval style compared to the British nondepressed participants. This phenomenon was consistent with a previous cross-cultural investigation of adults' earliest childhood recollections and self-descriptions (Wang, 2001), where the AM recollections of Western participants were significantly more specific than the recollections of Eastern participants. It is likely that different views of self are driving this pattern of retrieval. According to Markus and Kitayama (1991), an interdependent

construal of self and the relationship of self and other results in a less elaborated self-knowledge schemata as found in Eastern population. By contrast, an independent construal of self involves a representation of self that is independent and separate from others. In Western culture, the self-schemata associated with an independent, autonomous construal of self is very elaborated and interconnected. Hence retrieval of self-relevant information is facilitated in western population.

Previous research has demonstrated that Eastern people have a less specific AM retrieval style compared to Western people (Wang, 2001). One of the possible explanations comes from the investigation on the relationship between social interaction and memory development (Mullen & Yi, 1995). Research has demonstrated that the development of memory is determined by the nature of conversation between adult and child. When conversing with adults, children are taught the usefulness of conveying information about personal experience in order to meet the requirements of cultural values about issues like socialization. The results revealed that Western adults and children engaged in memory talk more often than Eastern adults and children in naturally occurring conversation. The results supported the theory that early experiences with past events talk influence the development of autobiographical memory. Moreover, the content of past event talk is associated with cultural values concerning socialization and culture value. For example, Western children are encouraged to talk about more personal feelings and thoughts in order to develop a strong sense of individuality. They also talked more about feelings and thoughts of self and others. Eastern children, on the other hand, focus their conversation more on the social role and behavioural expectations. Therefore, research has provided some evidence that the AM is developed at the stage of encoding process where AM recollection is determined

during the process of memory construction.

Furthermore, one conclusion from this study as well as based on previous research (Conway & Wang, 2004; Watkins & Baracaia, 2002; Watkins & Teasdale, 2001) is that there needs to be greater understanding of how culture interacts with thinking style manipulations (e.g., rumination) to influence cognitive processing. That is, rumination can be investigated in different components such as rumination versus distraction, self-focus versus analytic thinking and experiential versus analytical self-focus. All these subcomponents of thinking style could be influenced by culture. This will be described in the following sections.

Firstly, there are different ways of manipulating thinking style. For example, Watkins and Baracaia (2002), they found that by manipulating the awareness of mental process (i.e., participants were asked to focus on “how you decide to solve a problem”, process-focused questions versus “why you have a problem”, state-orientated ruminative questions) whilst engaging in a SPS task significantly influenced the SPS performance in depressed people. How culture would interact with different rumination subcomponents to influence subsequent cognitive processing remains a question.

Moreover, there is evidence from Wang and Conway (2004) such that people from different cultures use their memories for different directive functions. For example, the Eastern people are more encouraged to learn from their past experiences. They tend to engage in self-reflection to cultivate and perfect the self and therefore reflect on past mistakes in order to direct future behaviours. A

process-focused manipulation would facilitate this type of thinking. In contrast, Western people may use their memories for an instrumental purpose to approach the problems they are currently facing. It could be that the Eastern people would be more responsive to process-focused questions as these questions help them to direct the analytical thinking into more instrumental strategies for solving a problem.

In addition, previous research has shown that rumination can be investigated in terms of two independent components: self-focused and analytic thinking (Watkins & Teasdale, 2001). Self-focus refers to “a focus on symptoms and other aspects of self-experiences” whereas analytic thinking refers to “an analytical, evaluative cognitive style” (see Watkins & Teasdale, 2001, pp. 354). Their result demonstrated that these two factors have differential effects on AM retrieval as well as SPS. That is, self-focused thinking influences despondent mood whereas analytical thinking influences AM specificity respectively. As it has been suggested that Easterners are less self-focused than the Westerners, they also have more analytic thinking when facing problems and more self-reflection on past negative experiences (Wang, 2001; Wang & Conway, 2004). Therefore, it would be possible that the individuals from these two cultures would respond differently to these two distinct manipulations, as they are different at the baseline levels of self-focused and analytical thinking. Moreover, it was suggested that people from Western countries and Eastern countries have different ways of self-representation and different self-orientation such as independent oriented versus interdependent oriented (Markus & Kitayama, 1991; Leichtman, Wang, & Pillemer, 2003). Moreover, different varieties of ruminative self-focus have distinctive functional

properties (Watkins, 2004; Watkins & Teasdale, 2004; Watkins & Moulds, 2005). Not only research has demonstrated that focus on the emotional events and self-experience can help an individual to improve mental health and lead to more effective self-regulation (cf. Watkins, 2004, for a review), but also the self-focused attention helps to regulate emotional state (McFarland and Buehler, 1998). And further, mindfulness-based cognitive therapy (MBCT) helps the depressed patients to prevent from relapse (Teasdale et al., 2000). Furthermore, Watkins and Teasdale (2004) looked at the effect of manipulating either experiential self-focus (e.g., “Focus your attention your experience of the way you feel inside”) or analytical self-focus (e.g., “Think about the way you feel inside”) on the AMT performances in depressed patients. They found that experiential self-focus manipulation significantly reduced the categoric AM retrieval in depressed people pre- to post-manipulation. The results suggested that different modes of self-focus have differential effect in AM retrieval in depressed people. However, as it has been suggested that people in Western countries have more independent self-focus and people in Eastern countries have more interdependent self-focus. Eastern people also tend to employ self-reflection as a strategy to solve the problems that they are facing (Wang & Conway, 2004). It could be that the Eastern people would be more sensitive to the experiential self-focused manipulation than the Western people. However, there is no clear and direct evidence indicating that these two facets of self-focus are identical. Hence the association between this independent/interdependent self-focus and the different modes of self-focus (in terms of experiential versus analytical) needs to be further investigated. Moreover, future research on different dimensions of rumination needs to be explored in order to clarify the role of self-focused attention involved in the cognitive process

in different countries.

Unlike Study 3, the interaction between depression and culture in this study extended to the clinically depressed samples. In Study 3, a similar pattern of categoric and specific AM retrieval was found in the depressed groups from each culture such that both retrieved fewer specific AMs and more categoric AMs. In this study, the AM retrieval pattern found in the nondepressed controls was opposite to that pattern found in the clinically depressed groups. The British depressed participants retrieved significantly fewer specific AMs and more categoric AMs than their Taiwanese counterparts. In other words, the specific AM retrieval of the British depressed participants decreased dramatically compared to the British nondepressed participants, whereas this was not observed in the Taiwanese group. This inconsistent finding between the two studies may have occurred due to a smaller sample size being employed in Study 3. Study 3 involved 60 participants whilst the present study involved 120 participants, rendering it more reliable. The result demonstrated that depression may influence the model of working self driving AM retrieval in different ways, depending on culture. That is, with greater depression the Western individuals are probably activating more global negative emotional AMs of themselves. In contrast, depression may make individuals from the East more focused on themselves in a negative way which is manifested in their retrieval of specific instances of negative experience or negative emotion.

Interestingly, while culture interacted with depression on the AMT cueing task, the SPS performance as well as the AM retrieval during SPS showed more

cross-cultural consistency. For the two measures of MEPS performance, means and effectiveness, there was only an interaction for depressed status and thinking style. Consistent with previous research (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999), the depressed ruminators from both countries performed significantly poorer than the depressed distracters and their nondepressed counterparts. There were no cultural differences in terms of main effects or interactions on the two measures of the MEPS. This failure to find cross-cultural differences is consistent with Chang's findings (1998, 2001) showing that culture does not influence SPS performance. The failure to find cross-cultural differences extends the findings of Chang by demonstrating a lack of difference using a qualitative measure of SPS performance in addition to the quantitative, process measure administered by Chang (1998). As it has been indicated by D'Zurilla, Nezu, and Maydeu-Olivares (2004) that there are two different SPS measures: the process measure and the outcome measure. Process measures refer to the evaluation of one's strength or weakness such as attitudes or skills of solving social problems; whereas outcome measures refer to the assessment of one's performance to a specific social problem. As Chang's study (1998) used the SPSI-R, which is regarded as a process measure and the MEPS used in the present studies in this thesis, which is categorized as an outcome measure (cf. D'Zurilla et al., 2004). Taken the results from Chang (1998) and the Study 4 in this thesis together, the reason of this inconsistent result might be that people from Eastern culture and Western culture respond differently on the process measure. It might be that people from different cultures have different problem orientations; they might also employ different skills to approach a social problem. The reason why there was a cultural difference in Chang's study using

the SPSI-R is because the process measure is more sensitive to cross-cultural differences. However, in the present study the MEPS was administered to measure SPS. As the hypothetical problems in the MEPS can happen in the real-life situation in any cultures, thus an effective solution represents a good SPS ability in each culture. The reason for not replicating the previous finding by Chang (1998) might be due to the different SPS measurement used, which measure different aspects of SPS ability.

The failure to find differences on AM retrieval during SPS is in marked contrast to the AM differences observed on the AMT cueing task. There was neither a main effect of culture nor any interactions in respect of culture. These results suggested that depressed participants retrieved more categoric AMs as well as fewer specific AMs during SPS than the nondepressed participants. In addition, the ruminators from both countries had significantly more categoric AMs as well as fewer specific AMs than the distracters. It seems that cultural impact was no longer observed when the thinking style was manipulated. However, as there was no manipulation of the rumination before administering the AMT cueing task, it is difficult to ascertain whether the effects are due to the manipulation or to the task. With respect to the AMT cueing task and AM retrieval during SPS, a dual-task paradigm has suggested that different cognitive demands are involved in these two memory retrieval tasks. Goddard et al. (1998) investigated the effect of cognitive load on AM retrieval by manipulating the level of difficulty in a secondary task conducted concurrently with a primary task (i.e., one is the AMT cueing task, the other is a AM retrieval during the MEPS). They found that the AM retrieval during SPS was interfered with by both of the secondary tasks. On the other hand,

the AM retrieval on the AMT cueing task was only interfered with by the difficult dual-task. This result suggested that AM cueing Task makes fewer demand. Using a rumination manipulation with both the AMT and AM retrieval during SPS would help to resolve this issue.

Another difference between the two tasks is that the AMT cueing task requires individuals to retrieve AMs to emotional cue words. There is some evidence that there is cross-cultural variation in emotional processing. For example, Wang (2001) has demonstrated that, in contrast to the Easterners, the Westerners provided more emotionally elaborated AM recollections. They also rated their memories more positive or more negative rather than neutral; and their AM recollections were of higher emotional intensity. Wang also argued that emotion serves different functions in Western people and Eastern people. Western people are encouraged to express their feelings and emotion in order to affirm the importance of self. In contrast, Eastern people are encouraged to inhibit their emotional expression as this might be regarded as disruptive to interpersonal relationship. Thus it needs to be strictly controlled.

When the association between SPS and AM retrieval during SPS was examined through a correlation analysis, there did seem to be some subtle suggestion of a cultural impact. The result for the British group showed that specific AM retrieval during SPS was significantly positively associated with both the MEPS means score and the MEPS effectiveness score. However, the significant negative association between the categoric AM retrieval and the two MEPS scores was only found in the depressed ruminators. As for the Taiwanese

group, both the specific AM retrieval and the categoric AM retrieval during the SPS demonstrate significant association with SPS performance in all groups. Specific AM retrieval was positively associated with both means and effectiveness scores while categoric AM retrieval was negatively associated with these performance indices. Taking the two results together, culture seems to interact with depression in different ways for the ruminators and distracters respectively. The British depressed samples seem to be differentially responsive to the rumination and distraction manipulations whereas these manipulations are having less discriminating effects in the Taiwanese sample. It could be that the rumination manipulation is more likely to affect a well-constructed independent self-construal system manifested by Western participants.

One conclusion from this work is that there needs to be greater understanding of how culture interacts with thinking style manipulations to influence cognitive processing. There are different ways of manipulating thinking style. For example, Watkins and Baracaia (2002), they found that by manipulating the awareness of mental process (i.e., participants were asked to focus on “*how* you decide to solve a problem”, process-focused questions versus “*why* you have a problem”, state-orientated ruminative questions) whilst engaging in a SPS task significantly influenced the SPS performance in depressed people. How culture would interact with different rumination subcomponents to influence subsequent cognitive processing remains a question. However, there is evidence from Wang and Conway (2004) such that people from different cultures use their memories for different directive functions. For example, the Eastern people are more encouraged to learn from their past experiences. They tend to engage in

self-reflection to cultivate and perfect the self and therefore reflect on past mistakes in order to direct future behaviours. A process-focused manipulation would facilitate this type of thinking. In contrast, Western people may use their memories for an instrumental purpose to approach the problems they are currently facing. It could be that the Eastern people would be more responsive to a process-focused questions as this questions help them to direct the analytical thinking into more instrumental strategies for solving a problem.

In addition, previous research has shown that rumination can be investigated in terms of two independent components: self-focused and analytic thinking (Watkins & Teasdale, 2001). Self-focus refers to “a focus on symptoms and other aspects of self-experiences” whereas analytic thinking refers to “an analytical, evaluative cognitive style” (see Watkins & Teasdale, 2001, pp. 354). Their result demonstrated that these two factors have differential effects on AM retrieval as well as SPS. That is, self-focused thinking influences despondent mood whereas analytical thinking influences AM specificity respectively. As it has been suggested that Easterners are less self-focused than the Westerners, they also have more analytic thinking when facing problems and more self-reflection on past negative experiences (Wang, 2001; Wang & Conway, 2004). Therefore, it would be possible that the individuals from these two cultures would respond differently to these two distinct manipulations, as they are different at the baseline levels of self-focused and analytical thinking. Moreover, it was suggested that people from Western countries and Eastern countries have different ways of self-representation and different self-orientation such as independent oriented versus interdependent oriented (Markus & Kitayama, 1991; Leichtman et al., 2003). Moreover, different

varieties of ruminative self-focus have distinctive functional properties (Watkins, 2004; Watkins & Teasdale, 2004; Watkins & Moulds, 2005). Not only research has demonstrated that focus on the emotional events and self-experience can help an individual to improve mental health and lead to more effective self-regulation (cf. Watkins, 2004, for a review), but also the self-focused attention helps to regulate emotional state (McFarland and Buehler, 1998). And further, mindfulness-based cognitive therapy (MBCT) helps the depressed patients to prevent from relapse (Teasdale et al., 2000). Furthermore, Watkins and Teasdale (2004) looked at the effect of experiential self-focus (e.g., “Focus your attention your experience of the way you feel inside”) and analytical self-focus (e.g., “Think about the way you feel inside”) on the AMT performances in depressed patients. They found that experiential self-focus manipulation significantly reduced the categoric AM retrieval in depressed people pre- to post-manipulation. The results suggested that different modes of self-focus have differential effect in AM retrieval in depressed people. However, as it has been suggested that people in Western countries have more independent self-focus and people in Eastern countries have more interdependent self-focus. Eastern people also tend to employ self-reflection as a strategy to solve the problems that they are facing. It could be that the Eastern people would be more sensitive to the experiential self-focused manipulation than the Western people. The association between this independent self-focus versus interdependent self-focus and the different modes of self-focus in terms of experiential versus analytical needs to be further investigated. Future research on different dimensions of rumination is needed to be explored in order to clarify the role of self-focused attention involved in the cognitive process in different countries.

To sum up, there seems to be complex relationship between depression, culture and cognitive processing. When no thinking style manipulation is administered, there seems to be evidence of cross-cultural differences in AM retrieval. These differences seem to disappear with a rumination manipulation. More work needs to focus on how thinking styles interact with culture to influence cognitive processing. Such work is key in understanding how the self-schema operates in depression.

CHAPTER 7

GENERAL DISCUSSION

7.1 Overview

As it has been reviewed in Chapter 1, plenty of research has suggested that there is an association between thinking style (in terms of rumination and distraction), AM retrieval and SPS performance in depression. Rumination leads to more dysfunctional categoric AM retrieval as well as poorer SPS performance in depressed people (Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema et al., 1993; Watkins et al., 2000). However, no work has examined how thinking style influences AM retrieval in SPS. Furthermore, the way in which culture would interact with depression to influence SPS and AM retrieval during SPS has never been examined in this area. Therefore, the main aim of this thesis is twofold. Firstly, it will consider the role of rumination in SPS performance and AM retrieval during SPS. Secondly, it will examine how culture influences some aspects of cognitive processing in depression, notably AM retrieval and SPS performance. Depression is a universal mental disorder and there is a great deal of research about the epidemiology across cultures (Davidson & Neal, 2001). Research using depressed patients from a Western background shows that they manifest deficits in AM retrieval and SPS (Goddard et al., 1996; Williams & Dritschel, 1992; Williams & Scott, 1988). Little research has been conducted to see if these biases are culturally invariant.

Moreover, the cognitive mechanism underpinning this mood disturbance has

not been investigated from a cross-cultural perspective. Although it has been pointed out that it is of great importance to analyze and to interpret the findings of cross-cultural study in terms of both pan-cultural consistencies and cross-cultural differences (Mauro, Sato, & Tucker, 1992), there are few studies in this area. In this thesis, both accounts were taken into consideration and findings of the two cross-cultural studies will be interpreted in the following sections.

Study 1 (Chapter 3) examined the effect of rumination versus distraction on SPS ability and AM retrieval during the SPS process in a dysphoric university student sample. Study 2 (Chapter 4) used identical procedures to further investigate the association between these factors in a clinically depressed group. The results taken from Study 1 and Study 2 provided an opportunity to clarify the possible mechanism of thinking style on SPS process and AM retrieval during SPS. Moreover, the comparison between these two studies also allows an examination of the role that level of mood severity plays in this process. Study 3 (Chapter 5) and Study 4 (Chapter 6) were cross-cultural studies. Study 3 investigated cross-cultural differences in AM retrieval on the AMT cueing task in depressed people as a function of depression between Taiwanese and British (Eastern culture versus Western culture). In this study, the theories of central executive capacity and working self are considered in explaining the differences in AM retrieval in these two samples. The results from Study 4 investigated the influence of culture, depression, and thinking style on two other cognitive processes: SPS ability and AM retrieval during SPS. The main findings from the studies in this thesis will be discussed comprehensively in the following sections.

7.2 Summary and Implication of Main Findings

This thesis makes an attempt to elucidate the causal role of rumination and distraction in SPS as well as in AM retrieval during SPS. A linkage between cognitive measures (i.e., AM retrieval and thinking styles) and behaviour measures (SPS) was built. The main findings will be presented in the following paragraphs in the following sequences: (1) AM retrieval on the AMT, without the influence of thinking style manipulation, (2) SPS performance (in terms of relevant means and effectiveness of solutions), (3) AM retrieval during SPS (a spontaneous memory recollection) after receiving a thinking style manipulation. The implications of cross-cultural studies will also be introduced.

7.2.1 Findings of AM Retrieval on the AMT

7.2.1.1 AM Retrieval in terms of Specific and Categoric

A consistent finding was observed throughout the studies in this thesis. That is, both dysphoric and depressed samples demonstrated fewer specific AM retrieval and more categoric AM retrieval on the AMT cueing task than their nondysphoric and nondepressed counterparts. These results replicated previous research that depressed mood has a detrimental effect on the specificity of AM retrieval on the AMT cueing task (Williams & Scott, 1988; Williams & Dritschel, 1992). A great deal of evidence has demonstrated that both clinically depressed individuals and remitted depressed individuals (who are not currently experiencing any depressed mood or meeting the clinically diagnostic criteria of depression) have difficulties

in retrieving a specific AM whilst being required to do so (Brittlebank et al., 1993; Mackinger et al., 2000; Williams & Dritschel, 1988).

According to Beck's Schema theory (see Section 1.1.2.1 for a review), mood disturbance is the result of an interaction between negative cognitions and external stressful events. According to the differential activating hypothesis by Teasdale (1988), there is an association between a negative thinking pattern and depressed mood. This association is maintained by a reciprocal loop such that a negative thinking pattern is activated by the negative mood and the negative mood in turn strengthens the negative thinking pattern. This negative thinking pattern is repeatedly activated by stressful events and it becomes more and more sensitive to the external challenges, thus less and less negative impact is required to induce a negative mood. This provides some evidence that dysphoric and depressed individuals might be distinct from each other in their cognitive processing, such as the types of negative thinking pattern. For example, the depressed people may have a more global, negative and self-referent thinking style than dysphoric and nondepressed people.

Cognitive processing in dysphoric and depressed people has never been examined within one study. However, the results of Study 1 and Study 2 in this thesis show that these two groups did demonstrate similar AM retrieval style (i.e., they retrieved fewer specific AMs and more categoric AMs than healthy controls). Moreover, our data from Study 1 and Study 2 also allowed us to determine if differences in specificity existed between our non-clinically dysphoric group and the clinically depressed group. An analysis comparing levels of specificity

between the dysphoric group and the clinically depressed group revealed that the dysphoric group produced more specific AMs ($t(58) = 24.357, p < .01$) and fewer categoric AMs ($t(58) = -17.169, p < .01$) than the clinically depressed group did. This finding provided a further confirmation that dysphoric individuals had a different degree of AM specificity on the AMT cueing task when compared to the clinically depressed patients. A preliminary conclusion was made such that the specificity of AM retrieval is a function of the severity of depressed mood in terms of dysphoria and depression. However, there is a confounding variable that the two groups are different in their age and educational years. That is, the dysphoric students are younger and have more years of education than the clinically depressed patients group. We cannot conclude that the difference in AM retrieval between dysphoric and depressed groups is exclusively due to different levels of mood severity. As it has been pointed out in a review paper by Williams, Barnhofer, Crane, Hermans, Raes, Watkins, and Dalgleish (2006), IQ, educational years and other variables, such as processing speed and semantic fluency, need to be considered when studying AM retrieval in different groups. In order to elucidate the association between AM specificity and level of mood severity, further studies are called for, in which these two potential confounding variables are controlled.

Culture seems to have a pronounced effect on AM retrieval elicited from AMT in two cross-cultural studies (Study 3 and Study 4). The depressed groups from Taiwan and Britain produced fewer specific AMs and more categoric AMs than their nondepressed counterparts. This result revealed that depression has a universally detrimental effect to the AM retrieval on the AMT cueing task. This

result indicated that the central executive capacity is hindered by depression in both countries. Thus, they demonstrated a deficient AM retrieval strategy than that in nondepressed people.

In the nondepressed groups, a consistent finding was found between these two cross-cultural studies. The British nondepressed group had more specific AM retrieval and fewer categoric AM retrieval than their Taiwanese counterparts. This result replicated Wang's finding that Western people are more specific in their AM recollections than Eastern people. Interestingly, across the two cross-cultural studies, the pattern of AM retrieval on the AMT cueing task was different in terms of differences between the depressed groups. In Study 3, the results of independent sample t-test revealed that the depressed Taiwanese did not differ from the depressed British in their specific AMs as well as categoric AMs on the AMT. This result demonstrated that depression overrides the effect of culture on their AM recollections. One possibility for this phenomenon was that the decreased central executive capacity was responsible for the overgeneral AM retrieval in both cultures. It has been indicated by Dalgleish et al. (2007) that the overgeneral AM retrieval on the AMT is associated with an impaired central executive control. Moreover, Markus and Kitayama (1991) have proposed that the way in which people experience and express their emotion is influenced by their memory system (see Section 5.4 for a review). In this case, it seems that the intense negative emotion (clinical depression) wipes out the cultural effect for the AM retrieval in these two ethnic groups. However, a culture by depressed status interaction was also observed such that the British nondepressed had more specific AMs than the Taiwanese nondepressed participants (see Chapter 5 & 6).

On the other hand, the British depressed participants had fewer specific AMs and more categoric AMs than the Taiwanese depressed participants (see Chapter 6). The decreased central executive capacity hypothesis fails to explain this more complex observed phenomenon. It could possibly be that the different working selves are involved in this AM retrieval process across two countries. According to Conway and Pleydell-Pearce (2000), the working self is grounded in the AM in terms of the ranges and types of goals a person holds (see Section 1.2.2.3). The construction and processing of AM recollections are determined by the working self, and the working self is influenced by the interaction of the self-schema and external environment. For example, as research has demonstrated, Western culture is characterized by the independent view of self whereas the Eastern culture is characterized by the interdependent view of self (see Section 1.2.2.3 for a detailed description). Furthermore, it was suggested by Wang (2001) that the AM recollections in Westerners were more specific, self-focused, emotionally elaborated and lengthier than the AM recollections in the Easterners (see Section 5.1). Hence, AM strategy will definitely be influenced by culture through the different working self, which is shaped in different cultures. More recently, some research also demonstrated that the specific AM recall is associated with more differential affect-related self-representations (Ramponi et al., 2004).

With regard to the AM retrieval, difference was not observed between the Taiwanese depressed group and the British depressed group in the first cross-cultural study (see Chapter 5). Firstly the sample characteristics of the two Taiwanese depressed participants were examined using an independent sample t-test. There was no significant difference between ages ($t(43) = -.021, p > .05$),

years of education ($t(43) = 1.553, p > .05$) and the BDI scores ($t(43) = .766, p > .05$) between the two Taiwanese depressed samples (in Study 3 and Study 4). Thus the non-parallel finding between these two cross-cultural studies cannot be attributed to the differences in sample characteristics. One speculation for this inconsistent finding would be the smaller sample size used in the first cross-cultural study. Thus a type II error was considered to influence the interpretation of the findings (Williams et al., 2005, pp. 429).

7.2.1.2 Qualitative Analysis in terms of Autonomous Orientation and Self-other Ratio

According to Markus and Kitayama (1991), there are major differences between the self-construals of Western individuals and Eastern individuals, which are influenced by an independent view of self and an interdependent view of self respectively. A qualitative analysis of the AM recollections in terms of autonomous orientation and self-other ratio in Chapter 5 (Study 3, the first cross-cultural study) was conducted to verify these differences. Content analysis of AM retrievals provided preliminary evidence that these different self-construals exist. People from a Western culture are more autonomously oriented than people from an Eastern culture. In addition, people from a Western culture are also more self-focused (i.e., they revealed more self-related information than other-related information in their AM protocols on the AMT) than people from an Eastern culture. The results verify that the construction of the self-schema is a function of culture.

Furthermore, when the correlation between AM retrieval on the AMT and the

two qualitative measures were examined, a double dissociation between the specificity of AM retrieval and autonomous orientation or self-other ratio was revealed between the Taiwanese and the British depressed groups. As has been indicated in Chapter 5, when the British depressed participants were more autonomously orientated, they also generated less categoric AM recollections. In contrast, the more the Taiwanese depressed participants mentioned themselves in their AM recollections, the more specific AMs and the fewer categoric AMs they produced on the AMT. It seems that for the Taiwanese depressed people, the specificity of AM on the AMT is associated with the degree of self-focus. The more autonomous the British depressed people were, the less categoric AMs they retrieved on the AMT. The results suggest that AM specificity serves different functions in depressed people in different cultures to influence their cognitive styles (i.e., autonomous orientation and self-other ratio). As to the Taiwanese depressed people, this self-focused style may make it more difficult for them to fit into their society, in which an interdependent view of self is emphasized. As to the British depressed people, it seems that the depressed status influences both their autonomous orientation and the categoric AMs on the AMT.

The findings of the association between the BDI score and the autonomous orientation tendency provided evidence that, in the case of the British depressed people, as their depression increased, so their autonomous orientation decreased. However, this preliminary finding was based on a relatively small sample size and so it needs to be replicated in future studies.

7.2.1.3 Role of Emotional Stimulus in the AMT

Another possible reason for the observed cross-cultural differences on the AMT cueing task is that emotional cue words were employed. Wang (2001) indicated that the Westerners provided more recollections of high emotional intensity in their protocols than the Easterners. Moreover, the Westerners in this study were more likely to spontaneously mention feelings and emotions in their protocols. They also rated their recollections more positively or more negatively in contrast to the Easterners. The Easterners, in contrast, tended to rate their recollections neutrally. It seemed that the Westerners are more emotionally elaborated and more sensitive to emotional materials than the Easterners.

It was demonstrated that different types of emotional stimuli (i.e., nonverbal cues, such as emotional faces, affective images; verbal cues such as emotional words) have consistent impact on the retrieval of personal memories (Ridout, 2004; Ridout et al., 2003).

In cross-cultural studies of AM retrieval on the AMT in this thesis, an interesting phenomenon was observed such that British nondepressed participants retrieved more specific AMs than Taiwanese nondepressed participants did. One implication indicated by the results was the cross-cultural difference of the AM retrieval on the AMT. It was suggested that Western people had more emotionally elaborated AM retrievals compared to the Eastern people (Wang, 2001). In the AMT, emotional cue words are used which are self-focused in nature. Thus the British nondepressed participants are more responsive to these self-focused emotional cue words, which offered them a richer database to generate an AM in their past. However, a reversed pattern was found such that the British depressed participants had less specific AMs than Taiwanese depressed participants (see

Section 5.4 for a review). As Markus and Kitayama suggested, the way in which people experience and express their emotions is influenced by their self-construals, which are distinctively influenced by cultures. Matsumoto et al. also argued that the Westerners attend to more self-focused emotions such as joy, sadness, anger, and fear than the Easterners. From previous research, it was speculated that one possibility for this reversed phenomenon is that British people are more sensitive to emotionally elaborated materials, such as emotional words used in the AMT cueing task. The emotional cue words used in the AMT are self-focused emotional cue words such as happy, sad, angry. Thus, the emotional cue words have a particularly strong impact on the British depressed participants. Hence, the specific AM retrieval of British people decreased more dramatically when they became depressed, in comparison with Taiwanese people. As suggested in Chapter 5, a memory retrieval task using neutral words would be helpful to clarify the role that emotion plays in memory processing between people from a Western culture and a Eastern culture. It would also help to investigate whether this different AM retrieval style still exists when the emotion variable is controlled.

7.2.2 Role of Rumination in SPS and AM Retrieval during SPS

A great deal of evidence has indicated that rumination can influence cognitive performance on tasks such as SPS and AM retrieval in depressed people. With respect to the relationship between rumination and SPS, as indicated in the introduction, rumination can influence SPS in depressed people (Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema et al., 1993). Depressed people who were requested to focus on their thoughts, feelings and

possible causes and consequences of these thoughts and feelings would demonstrate poorer SPS performance (i.e., they tended to produce less relevant means and their solutions were less effective) when compared to the depressed people who were requested to distract themselves from their thoughts and feelings (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999). Other studies have shown that rumination also influences AM retrieval in depressed and dysphoric people (Lyubomirsky et al., 1998; Watkins et al., 2000). For example, depressed and dysphoric people who ruminate come up with more categoric AMs on the AMT, or they generate more negative AMs in a free recall task than the distracters. Furthermore, there is also evidence that AM retrieval during SPS influences SPS performance (Goddard et al., 1996). However, there is no clear evidence that rumination influences AM retrieval during SPS, which in turn could influence SPS performance. The results of two studies (i.e., the Study 1 using a dysphoric sample and the Study 2 using a clinically depressed sample) provided data to answer this question.

In the dysphoric sample, rumination was found to influence one of the MEPS measures: the MEPS effectiveness score but not the MEPS means score. However, rumination had no significant influence on AM retrieval during SPS. In the clinically depressed group, the effect of rumination was more pronounced than the effect in the dysphoric sample such that rumination significantly influenced SPS performance on both measures of the MEPS: number of relevant means and effectiveness of solutions. Moreover, rumination also influenced AM retrieval during SPS such that the ruminators had significantly fewer specific AMs and more categoric AMs during SPS than the distracters. Considered together, the

results of these two studies demonstrated that rumination interacts with mood severity (in terms of dysphoria and depression) to influence SPS performance and AM retrieval during SPS. Williams et al. (2005) tested a Differential Activation Theory in formerly depressed patients with a suicide ideation (*MDD -suic*) by examining their SPS and AM retrieval pre- and post- negative mood induction. The negative mood induction was manipulated prior to performing the MEPS and the AMT cueing task by asking the participants to listen to sad music and to read the cards containing sad statements such as “There are things about me that I don’t like”. Their mood ratings were taken by using the visual analogue scales (VAS; each 10 centimetres in length). It was shown that the mood ratings of the *MDD -suic* group were significantly worse than the control group after the negative mood induction. The AMT cueing task and the MEPS were used to examine the specificity of AMs as well as SPS ability. They found that previously suicidal patients did not show impairment on the number of relevant means on the MEPS performance following mood challenge. However, they did demonstrate impairment in another measurement of the MEPS: effectiveness of solutions following mood challenge. Taken together with their previous findings with suicidal patients (Pollock & Williams, 2001), the AM specificity was correlated more highly with MEPS effectiveness scores than the MEPS means scores.

One of the possible explanations that the authors made to this puzzle was based on the differential activation model. According to this model, mood challenge reactivates negative thinking, which in turn impedes SPS performance. It could be that effectiveness is more sensitive to the reactivated negative thinking pattern. That is, mood challenge leading to a more internally focused, ruminative

processing style that has a stronger effect on effectiveness index in contrast to relevant means index.

In conclusion, rumination has no significant effect on the cognitive processing in the dysphoric group. In contrast, rumination does show strong influence on SPS through the dysfunctional categoric AM retrieval during SPS. Mechanisms involved in SPS are quite complex and warrant further investigation.

There is consistent evidence that rumination influenced AM retrieval and SPS in clinically depressed people (Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1993, Nolen-Hoeksema et al., 1993). With respect to SPS and AM retrieval during SPS, the culture no longer affected either of these cognitive measures after the thinking style manipulation was conducted. As has been indicated in the Discussion of Chapter 6 (Section 6.4), with regard to SPS performance, there was an interaction between thinking style and depressed status on SPS performance. The depressed ruminators performed more poorly on SPS than the depressed distracters and nondepressed controls. The results suggested that depressed individuals do show some pan-culture consistencies in their cognitive performance. The depressed individuals demonstrated SPS deficits regardless of culture, though their solutions to hypothetical problem situation may be varied according to the different culture they are from. Moreover, the effective solutions should be culture-specific as the solutions were evaluated within a cultural construct, which means that one effective solution to a hypothetical problem situation in one culture will not necessarily be still effective in another culture. It is of great interest to look at the pan-culture similarity as well as the

cross-cultural discrepancies on their SPS performance in future studies.

With regard to AM retrieval during SPS, the pan-culture consistency was again observed such that the depressed participants and the ruminators from both countries demonstrated a dysfunctional AM retrieval during SPS. This result, concerning AM retrieval during SPS, was different from the results on the AMT cueing task, which did show cross-cultural difference. There are at least two possible explanations for this discrepancy. One of the possible explanations for this non-parallel finding was that the two AM tasks are distinct from each other in nature. Previous research has suggested that these two memory tasks are distinctive in their cognitive load (Goddard et al., 1998). The AMT cueing task is less resource demanding, as only emotional cue words are involved, whereas AM retrieval during SPS is more resource demanding, as a more complex problem situation is involved. The other possibilities could be the effect of thinking style manipulation involved (rumination versus distraction). The effect of culture no longer holds after the rumination manipulation. It was speculated that rumination interacted with the different working selves (which are presumed to be different in baseline levels of self-focus) and wiped out the culture influence. Hence, the individuals did not show different AM retrieval strategies in their SPS process.

Research focusing on the association between rumination and SPS, as well as AM retrieval during SPS in depressed people, has not yielded strong evidence. As was indicated in the previous research, rumination is not a unitary phenomenon (Watkins & Teasdale, 2001). Watkins and Teasdale investigated the influence of two different components of rumination on AM retrieval in depression. These two

components are termed analytic thinking and self-focused thinking. The results demonstrated that these two components were found to have differential influence on mood and AM retrieval such that self-focused thinking is associated with depressed mood whereas analytic thinking is associated with AM retrieval independently. As was demonstrated in the previous studies, that rumination has significant influence on AM retrieval and SPS in depressed people. Thus it was speculated that these two different components might influence AM retrieval during SPS distinctly, which in turn affects the SPS performance in depressed people. It would be worth identifying further the role of self-focus and analytic thinking in AM retrieval during SPS and SPS performance.

Previous research has discussed different functions of state-oriented rumination and process-focused rumination in depressed people (Kuhl, 1981, 1994; Watkins & Baracaia, 2002). A state-oriented rumination involved analysis and evaluation of past experience to generate alternatives to solve a problem, and this preoccupation further inhibited individuals from taking new actions to solve a problem. In contrast, a process-focused rumination involved effective self-monitoring and direction of the reflective thoughts into actions towards a problem (Watkins & Baracaia, 2002). Recent findings have also revealed that a process-focused rumination is helpful in increasing the mental processing in depressed people by asking them to focus on the moment-to-moment experience, thus in turn improving their SPS performance. Whereas a state-oriented rumination is detrimental, such that it impairs SPS performance in the recovered depressed people (Watkins & Baracaia, 2002). The causal role of rumination and its subcomponents in cognitive process needs to be further explored in the future.

7.2.3 Association between SPS Performance and AM Retrieval during SPS

It was indicated in previous research that SPS performance is associated with the types of AM retrieval during SPS, such that the categoric AM was found to contribute to poor SPS in depression (Goddard et al., 1996). Taking the results from studies using dysphoric and depressed groups together, a consistent association was observed in overall participants such that SPS performance (in terms of means and effectiveness) was significantly positively correlated with specific AM retrieval during SPS. A significant negative correlation was found between SPS performance and categoric AM retrieval during SPS. The only exception was that in the Study 1 (in the total sample of 60 participants), only significant correlations were found between the specific and categoric AMs retrieval during SPS and the MEPS effectiveness score but not for the means score. It warrants noting that there is a possibility of overestimating the association between MEPS performance and AM retrieval during SPS due to Type I error arising from conducting multiple correlations.

The differential activation theory (Teasdale, 1988) might offer some possible explanations for this selective association between the two different MEPS measures and AM retrieval during SPS. The differential activation theory suggested that the association between negative thinking and depressed mood is maintained through a reciprocal loop such that negative mood leads to negative thinking and vice versa. The severity of depression is determined by the types of negative thinking patterns. The depressed individuals hold a more negative, global,

and self-referent dysfunctional thinking pattern than that in nondepressed individuals. This dysfunctional thinking pattern is activated and strengthened through the low mood that is triggered by the external stressful events. Hence, less stress is required to trigger or worsen the depressed mood in the depressed individuals, in contrast to nondepressed individuals. Also, this detrimental process becomes more and more autonomous with the increasing episodes of depression (Lau & McMain, 2005; Lau et al., 2004; Williams et al., 2005). Research has also demonstrated that formerly depressed patients showed reactivated negative thinking patterns after mood challenge (Lau et al., 2004). Given that rumination is one form of mood challenge (i.e., the mood rating becomes worse after the rumination manipulation, see sections relating to manipulation check in this thesis), it reactivates the negative thinking pattern in depressed individuals that can, in turn, worsen their SPS performance and AM retrieval during SPS. It has been proposed that the two MEPS measures are distinctly influenced by the reactivation of negative thinking pattern (Pollock & Williams, 2001; Williams et al., 2005). In Williams et al., (2005), the results demonstrated that, although the *MDD-suic* patients remained able to produce some relevant means toward a problem solution, in contrast, the effectiveness measure was more easily interfered with by mood challenge. It was argued that effectiveness measure was more sensitive to the reactivation of the negative thinking pattern following mood challenge, in which an internally focused, ruminative strategy is involved. As can be seen in Pollock and Williams (2001), memory specificity was correlated more highly with the effectiveness score than with the number of means score (Pollock & Williams, 2001). It seems that there are different mechanisms involved in these two MEPS measures, relevant means and effectiveness.

Furthermore, when further examination was done on the association between SPS and AM retrieval during SPS between the dysphoric/depressed versus nondysphoric/nondepressed and rumination/distraction groups, a mixed picture was presented. First of all, in the dysphoric/nondysphoric sample (Study 1), only a significant negative correlation was found between the SPS and categoric AM retrieval in the dysphoric group. Secondly, in the depressed/nondepressed sample (Study 2), specific AM retrieval was found to be associated with MEPS means score or/and MEPS effectiveness score in four groups (i.e., the nondepressed/depressed ruminators and distracters). However, categoric AM retrieval was only found to be associated with MEPS scores in the depressed ruminators. The implication from these two studies was that specific AM enhance the SPS in four groups whereas the deteriorated SPS in the depressed ruminators was mediated by the categoric AM during SPS. It showed a particularly negative effect of categoric AM retrieval on SPS.

Taking the results from Study 1 and Study 2 together, the discrepancies between the results of association between SPS and AM retrieval during SPS can provide further evidence for the differential activation hypothesis. Only categoric AM retrieval was found to be associated with SPS performance in the dysphoric group. It could be that the thinking pattern of the dysphoric individuals is less impaired and less negative so that the reactivation of negative thinking by rumination has a less detrimental effect on both their SPS performance and AM retrieval during SPS. In contrast, rumination has a greater negative influence in depressed individuals on their SPS performance and AM retrieval during SPS. It

could be that depressed individuals have more a dysfunctional thinking pattern and this pattern is more sensitive to mood challenge (e.g., rumination). Thus, both the SPS performance and AM retrieval during SPS were more impaired compared to the other three groups. A more significant association was also found between both specific and categoric AM retrieval and the SPS performance.

As has been reviewed in Chapter 6 (Section 6.4), culture interacted with depression and thinking style to influence the association between SPS and AM retrieval during SPS. More specifically examined, a double disassociation was found in the British depressed groups such that the specific AM retrieval during SPS was positively associated with SPS performance in the British depressed distracters. On the other hand, the categoric AM retrieval during SPS was negatively associated with SPS performance in the British depressed ruminators. The results suggested that the impeded SPS performance (both means and effectiveness) in the British depressed ruminators is associated with the number of their categoric AMs during SPS. This finding replicated previous research that categoric AM retrieval was strongly associated with the impaired SPS (Goddard et al., 1996). The improved SPS performance demonstrated in the British depressed distracters is contributed to by the specific AMs retrieved during SPS. However, the results were more divergent in the Taiwanese depressed groups. The specific AM retrieval during SPS is significantly associated with both SPS measures in the Taiwanese depressed ruminators, whereas only fewer categoric AM retrieval during SPS is associated with more effective SPS performance. In the Taiwanese depressed distracters, more specific AMs and fewer categoric AMs are associated with the relevant means generated on SPS but not with the effective SPS

performance. It seems that the distraction manipulation can only improve the relevant means in the Taiwanese depressed people but not the effectiveness of solutions. However, their improved SPS in contrast to the ruminators was contributed to by other factors but not by AMs retrieved during SPS. One of the possible factors for the increased relevant means in the distracters might be that the distraction enhances their mood and makes them take more initiative in engaging in SPS. The reason for failing to replicate on another SPS measure, that of effectiveness, might be because an effective SPS strategy in the Taiwanese sample was the solution of problems according to social norms but not by autobiographical recollections. In contrast, the distraction helps the British depressed participants to free more cognitive resources from the depressogenic thinking, which is in accordance with the central executive capacity theory (Conway & Pleydell-Pearce, 2000; Williams, 2006) that more executive capacity becomes available after distraction manipulation for retrieving specific AMs to facilitate the SPS performance. Taking these results together, culture seems to interact with depression in different ways to influence their cognitive processing for the ruminators and distracters. The British people responded differentially to rumination and distraction manipulation whereas these manipulations have a less discriminating effect in the Taiwanese sample.

To sum up, the results concerning the association between SPS performance and AM retrieval during SPS from the second cross-cultural study (Study 4) in this thesis demonstrated a mixed picture. This association was influenced by the effect of rumination (where self-focused attention is involved) interacting with depression. As the different subcomponents of self-focused attention (e.g.,

self-focused versus analytical; processed-focused versus state-oriented) mediate the function of the working selves, a further breakdown investigation would be helpful to clarify how culture would influence these associations. A comparison of the baseline level of self-focused tendency would be specifically needed to address the association between SPS performance and AM retrieval during SPS in different cultures.

7.2.4 The Role of Distraction Played in Depressed People

In view of the finding that the depressed distracters produced more effective solutions to hypothetical problem situations after the manipulation, their responses were compared with those produced by nondepressed participants to investigate the possible mechanism of how distraction enhances SPS performance in depressed people. These examples appear in Appendix 7.

Firstly the responses from Scenario 2: Suppose that your friends tease you for not socializing enough then what you would do to make your friends respect your choice were compared. Both responses received the same effectiveness rating. An effective solution is defined as a strategy to solve the social problem so that a positive outcome is maximized while minimizing possible negative outcomes (Marx et al., 1992). Responses to this scenario from both the non-depressed control participant and the depressed distracter included key relevant steps such as explaining the reasons for not socializing much, trying to going out with friends more often. However, the response of the nondepressed participant also contained some self-reflections such as *'Am I reasonable?'* *'Too much work to do?'* There

was also evidence of analytical thinking in the response such as *'Ask myself why I'm not socializing enough, if they are right'*.

The responses of a depressed distracter and a non-depressed control were also compared in another scenario, friends moving to a new neighborhood (see Examples C and D in Appendix 7). Again, as in the previous scenario, both participants received the same effectiveness rating. This rating was obtained because both responses included equally useful strategies such as *'to know more friends after moving to a new neighbourhood'*, *'introduce oneself to neighbours and people at work'*, *'join societies'*, and *'have a house warming party and invite everyone around'*. However, closer inspection of the responses also revealed some subtle differences. The nondepressed participant showed a more self-assertive attitude in his/her response through comments such as *'Continue with whatever hobbies you had where you used to live'*, *'Have a few quiet weeks setting in'*. This same level of confidence was not apparent in the response of the depressed distracter.

Previous research has indicated that depressed people who have experienced a distraction manipulation would demonstrate improved SPS performance (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky et al., 1999). However, little is known about the similarities and differences of the quality of responses produced by the depressed distracters and their non-depressed controls. The examples above provided some evidence for the similarities as well as some preliminary speculations for differences between these two groups. Analytic thinking and self-assertiveness may be unique features in nondepressed people. In

contrast, even when the effectiveness of SPS responses was improved in the depressed participants by the distraction manipulation, they seemed to lack those features, which may be protective factors to keep people from becoming depressed. This conclusion is tentative as it is based on analysis of only a few examples. More work should be done to confirm this pattern.

Another issue that needs to be addressed is how the responses to solutions differed between the depressed ruminators and depressed distracters. Responses to the problem having a big row with your partner were therefore examined in one depressed ruminator and one depressed distracter (see Examples E and F in Appendix 7). Both SPS responses mentioned the steps like '*think it through*' or '*talk it through and compromise*'. However, the depressed distracter also described steps such as '*walk the dog*' or '*visit a friend*'; such steps would encourage the respondent to take their mind off the current problem for a while. In contrast the depressed ruminator mentioned the dysfunctional strategies of avoiding the situation and having an emotional reaction to it. It seems that the distraction manipulation successfully improved current sad mood and helped the participant to identify activities that would facilitate distraction. Again this speculation is based on only a limited data sample and requires further investigation before firm conclusions can be drawn.

In conclusion, there has been no research directly examining the similarity and differences of the solutions to MEPS scenarios produced by the depressed distracters versus the non-depressed controls. Our analyses demonstrated that after a distraction manipulation, the SPS effectiveness was improved in the depressed

participants. When comparing the solutions of a depressed distracter versus a depressed ruminator, the depressed distracter not only provided a more effective solution than the depressed ruminator but also included distracting activities in their solutions. In contrast, the depressed ruminator gave an emotional and an avoidant response. However, the distraction manipulation did not facilitate the self-assertiveness or analytic thinking in the two depressed participants. These factors might be enduring features that protect people from depression. More work is needed to investigate how distraction helps to improve SPS performance in depressed people as well as how these factors (e.g., self-assertiveness and analytic thinking) contribute to effective SPS performance. These conclusions are tentative and need further examination in future work.

7.3 Limitations

There are several limitations need noting, with respect to methodological issues and interpretations of results in these studies.

7.3.1 Baseline Level of Rumination and Effect of Rumination on the AMT Performance

One of the caveats of this thesis is that the baseline level of ruminative tendency across two cultures has not been investigated yet. Moreover, the influence of thinking style (rumination versus distraction) on AM retrieval on the AMT cueing task in the Taiwanese depressed and the nondepressed groups needs to be clarified. It is indicated that AM is a function of the self-system: the way

individuals memorize their experiences would be determined by their self-systems. Moreover, the working self is shaped through the interaction between self and the external environment. Thus the self-system is determined by the social norm and collective consciousness where one has lived. Therefore, it can be hypothesized that individuals from different cultures possess different working selves. According to previous research, the Westerners are more self-focused than the Easterners. The meaning of the selfhood for the Easterners is linked to social relationship. It is reasonable to assume that the baseline of self-focused ruminative tendency would be different between people from different cultures. However, the baseline level of ruminative tendency between these two cultures has never been taken in any previous studies. Furthermore, no study has investigated how rumination (i.e., self-focus attention) would influence the AM retrieval (e.g., AM retrievals on the AMT) in the Eastern sample. Therefore, more research is needed to clarify the association between rumination and AM retrievals across these two cultures.

7.3.2 Mood Severity Index (the BDI) and AM Retrieval on the AMT

In Study 3 of this thesis, AM retrieval on the AMT cueing task was consistently found to be associated with the mood severity measured by the BDI in both British participants and Taiwanese participants across the two cross-cultural studies. However, when the participants from these two countries were divided into nondepressed group and depressed group, more divergent findings emerged. There were no longer significant correlations between the BDI scores and the types of AM retrieval (in terms of specific and categoric) on the

AMT cueing task in most of the groups. For example, in the first cross-cultural study, there was only a significant negative correlation between specific AM retrieval and the BDI score in the British nondepressed group and a significant negative correlation between categoric AM retrieval and the BDI score in the Taiwanese depressed group. With respect to the second cross-cultural study, there was only a significant negative correlation between specific AM retrieval and the BDI score in the British nondepressed group. The results demonstrated that, in the clinically depressed group, there is little evidence suggesting that the mood severity (i.e., the BDI score) is associated with AM retrieval on the AMT cueing task.

These findings coincided with one of the methodological limitations proposed by Williams et al. (2006). The authors argued that a diagnosis of depression is associated with overgeneral AM retrievals. However, there is no clear evidence, which suggests that mood severity is correlated with the degree of overgenerality of AM retrieval (see Williams, et al., 2006 for a review). In an attempt to clarify this issue, some of the BDI characteristics will be discussed in the following section.

One of the most important functions of the BDI is to allocate participants into different groups according to their depressed status because of its well-known validity of differentiating nondepressed and depressed groups (Richter, Werner, Heerlein, Kraus, & Sauer, 1998). Moreover, the BDI scores also represent the severity of depressed mood. In this case, an association between mood severity (measured by the BDI) and AM retrieval on the AMT cueing task was expected.

One speculation for this undiscovered association is due to the nature of the BDI. The BDI is a self-report mood-rating inventory, which measures the cognitive, affective and psychomotor aspects of the individual. Richter et al. (1998) have indicated that the advantages of the BDI are of high internal consistency, high content validity, validity in differentiating nondepressed and depressed groups, and it is sensitive to changes and international propagation. But it also has some disadvantages, such as instability of score over short time intervals and so on. Moreover, the items of the BDI were based on the subjective presentation, thus it could be affected by other variables such as self-report bias and social desirability (Clark, Crewdson, & Purdon, 1998; Hunt, Auriemma, & Cashaw, 2003; Richter et al., 1998; Scafidi, Field, Prodromidis, & Abrams, 1999). Previous research also suggested that the BDI score could also be influenced by other factors such as defensiveness and denial (Scafidi et al., 1999).

Another possible way to address this issue is derived from the argument of trait versus state. The BDI is designed to measure the severity of the current mood state, thus it would be regarded as measuring a state variable. However, depression is a clinical diagnosis in which a certain number of criteria need to be met over six months for individual to be diagnosed as Major Depressive Disorder according to DSM-IV. Furthermore, as previous research has suggested, overgeneral AM retrieval is an enduring cognitive deficit that can also be found in remitted depressed patients (Brittlebank et al., 1993; Mackinger et al., 2000; Williams & Dritschel, 1988; see Section 1.2.2.4 for a review). The overgeneral AM retrieval style is categorized as a trait marker, though some evidence

suggested that it could be improved through MBCT (Williams et al., 2000).

It is worth noting that the significant correlations observed in the nondepressed groups should be treated with caution. Although the BDI scores of participants in the nondepressed groups range from 0 to 5, it does not necessarily imply an existing clinical significance. That is, an individual with a BDI score 1 may not be clinically significantly different from an individual with a BDI score 4.

Future work needs to employ a more objective (e. g., clinician-rated mood measurements) and a more sensitive mood-rating inventory to examine this potential association between mood severity and AM retrieval on the AMT.

7.3.3 Limitations associated with the MEPS

The MEPS procedure has been widely used in investigating SPS. It yielded consistent findings of association between the poor quality of MEPS solutions and mental disturbance in both suicidal and depressed patients (Evan et al., 1992; Goddard et al., 1996, 1997, 2001; Marx et al., 1992; Watkins & Baracaia, 2002). However, there are still some methodological issues with respect to the validity of the MEPS procedures (see Section 1.4.2.1). For example, D’Zurilla and Maydeu-Olivares (1995) have argued that the MEPS is an instrument to test the imaginative solutions to the hypothetical problem situations rather than really measuring the problem-solving implementation process. In addition, the MEPS also consists of unrealistic problem situations such as killing a former SS trooper

or stealing a diamond. The administration of a personalized SPS task would help to increase the ecological validity of the MEPS. An example of such a task would be the request to participants that they list the greatest social problems they are currently facing and then give the solutions (see Lyubomirsky et al., 1999 for an example).

There are also other SPS measures that assess the process measure aspect of SPS (D’Zurilla et al., 2004). D’Zurilla et al. (2004) suggested the Social Problem-Solving Inventory for Adolescents (SPSI-A; Frauenknecht & Black, 1995, 2003), the Problem-Focused Style of Coping (PF-SOC; Heppner, Cook, Wright, & Johnson, 1995), and the Perceived Modes of processing Inventory-rational Processing (RP) scale (Burns & D’Zurilla, 1999). However, the present process measures of SPS encounter a difficulty in that most of them lack empirical support for the constructive validity.

7.4 Directions for Future Research

This thesis is the first to look at how thinking style (rumination versus distraction) influence SPS performance as well as AM retrieval during SPS in clinically depressed people. It also demonstrates some preliminary cross-cultural implications with respect to AM retrieval strategies on the AMT cueing task as well as the influence of thinking style in SPS and AM retrieval during SPS. According to the findings from the studies, some interesting thoughts about future directions in line with the findings as well as the current research interest will be outlined in the following sections.

As mentioned in the Section 7.3.2, the effect of thinking style on AM retrieval on the AMT has never been examined cross-culturally in any previous research. A full picture of these interrelationships between AM retrieval (an instructed AM retrieval), SPS, and AM retrieval during SPS (a spontaneous AM retrieval) cannot be established until this result is collected. Furthermore, research has indicated that individuals from a Western culture are more self-focused than individuals from an Eastern culture (Wang, 2001). Thus it can be concluded that people from different cultures have a different degree of self-focused ruminative tendency. However, the difference in the self-focused tendency between different cultures has not been systematically examined yet. It needs to be established by using self-report measurements, such as the Response Style Questionnaire (the RSQ; Nolen-Hoeksema & Morrow, 1991), which is designed to measure the tendency to ruminate, or the Rumination on Sadness Scale (the RSS; Conway et al., 2000), which is designed to assess the ruminative response specifically related to sadness and distress. These questionnaires are helpful in providing more evidence in this research area with respect to the tendency to ruminate in a stressful situation and its association with other interested cognitive variables such as AM retrieval and SPS. Then the effect of trait versus state rumination could be clarified.

Recent studies on rumination have made further attempts to examine the influence of rumination in terms of different subcomponents, such as self-focus versus analytic, experiential self-focus versus analytical self-focus, and concrete self-focus versus abstract self-focus (see Chapter 1 for a review). These different components of rumination may interact with culture to serve different functions in

cognitive processing. For example, Watkins and Teasdale (2001) first looked at effect for high versus low self-focus and analytic thinking in depression. The results demonstrated that analytic thinking style influenced AM retrieval whereas self-focus influenced depressed mood independently. Other subsequent studies, which continued to examine adaptive and maladaptive function of rumination, also yielded consistent support in this area. That is, different modes of self-focused rumination have distinctive influences in depressed people, either on their AM retrieval or on their SPS ability (Watkins, 2004; Watkins & Baracaia, 2002; Watkins & Mould, 2005; Watkins & Teasdale, 2004). For example, experiential self-focus manipulation and concrete self-focus manipulation were found to facilitate the specific AM retrieval and to enhance SPS performance in depressed people. In contrast, analytical self-focus manipulation and abstract self-focus manipulation were found to be associated with overgeneral AM style or deficient SPS performance.

It is worth looking at how these two distinct modes of self-focus would interact with depression to influence different AM tasks such as AMT or AM retrieval during SPS, which differ in the degree of task demands. Firstly, taking a comparison between the two AM tasks, the AMT cueing task requires less cognitive resource; whereas AM retrieval during SPS requires more cognitive load. Secondly, previous research suggested that Westerners have more self-focused statements in their AM recollections than the Easterners (Wang, 2001). Moreover, other research indicated that Easterners in contrast, tend to make reflections on their past mistakes (i.e., think about the causes and consequences of their actions) (Wang & Conway, 2004). It would be worth examining how these two different

styles (self-focused and analytical/reflective thinking) correspond to the different modes of self-focus and analytic thinking cross-culturally. However, these descriptions need to be well-defined and to be further examined in the same study to establish the association between the tendency to focus on different aspects of the self and other cognitive performance.

These two different characteristics are found to be associated with the maladaptive rumination subcomponents (i.e., self-focus and analytical). However, no research has been done to clarify how these two culture-specific phenomena would contribute to depression. Furthermore, as has been demonstrated in our results, Taiwanese participants and British participants respond differently on the AMT cueing task. However, we do not know whether this discrepancy is due to the distinctive response to emotional materials or the general encode and retrieval pattern in Taiwanese people. Barnard et al. (2006) have employed a different manipulation to induce an analytic self-rumination without exacerbating negative mood (see Barnard et al., 2006, pp. 332-333). Barnard et al. (2006) argued that the mode of analytical rumination can be manipulated by asking the participants to reflect and generate self-related information focusing on a narrow self-rated theme. In this way participants are manipulated to focus their attention on one self-related theme repeatedly at a propositional level without going into a schematic level, in which the self-related information can be more elaborated through the thinking from instance to instance. This new approach may be helpful to cross-cultural investigations simply examining the direct effect of self-focus on AM retrieval on the AMT and partialling out the indirect effect that is induced by negative mood.

Depression is characterized by low mood, lack of motivation, and impaired cognitive functioning in various aspects such as memory, attention, judgment and problem solving. Hertel (1994) has proposed that one of the reasons for the impaired memory in depression was decreased initiative capacity. That is, depressed people failed to allocate their attentional resources when even the attentional resource is sufficient. This difficulty was regarded as due to lack of initiative. Moreover, one of the MEPS measures, relevant means, is an indication of the ability to generate possible steps from the problem scenario to the happy ending. However, very little evidence has directly examined whether the cause of inability to generate relevant means in depressed people is exclusively due to the impairment of initiative. Future work needs to be done to clarify this issue.

The results from the correlational analysis between the type of AM retrieval during SPS and SPS performance provided preliminary evidence that the tendency to retrieve a specific AM as a problem-solving strategy is strongly associated with the ability to generate relevant means on the MEPS in depressed ruminators and distracters from both cultures. This finding opens an avenue to future studies in investigating the association between the specific AM retrieval as a strategy to SPS and the ability to generate relevant solutions to social problems. It would also be of interest to investigate how central executive capacity would influence this process.

7.5 Final Conclusions

In conclusion, this thesis provides evidence that ruminative thinking

negatively influences SPS and AM retrieval during SPS in a clinically depressed sample. Moreover, a successful SPS is associated with the types of AM retrieval involved in SPS process. Specific AMs during SPS are beneficial to SPS performance whereas categoric AMs are detrimental to SPS performance. With respect to the cross-cultural issue, AM retrieval on the AMT cueing task can also be influenced by cultures. Both pan-culture similarities and cross-cultural differences are demonstrated with respect to AM retrieval and SPS performance.

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APPENDICES

Appendix 1 Beck Depression Inventory

Instructions

This questionnaire is designed to allow you to indicate how you have been feeling during the last week (Including today). For each of the 21 items please circle the number next to the statement that best represents how you have been feeling.

- | | | | | | |
|----|---|--|----|---|--|
| 1. | 0 | I do not feel sad. | 7. | 0 | I don't feel disappointed in myself. |
| | 1 | I feel sad. | | 1 | I am disappointed in myself. |
| | 2 | I am sad all the time and I can't snap out of it. | | 2 | I am disgusted with myself. |
| | 3 | I am so sad and unhappy that I can't stand it. | | 3 | I hate myself. |
| 2. | 0 | I am not particularly discouraged about the future. | 8. | 0 | I don't feel that I am any worse than anybody else. |
| | 1 | I feel discouraged about the future. | | 1 | I am critical of myself for my mistakes and weaknesses. |
| | 2 | I feel that I have nothing to look forward to. | | 2 | I blame myself all the time for all my faults. |
| | 3 | I feel that the future is hopeless and things cannot improve. | | 3 | I blame myself for everything bad that happens. |
| 3. | 0 | I do not feel like a failure. | 9. | 0 | I don't have thoughts of killing myself. |
| | 1 | I feel that I have failed more than the average person. | | 1 | I have thoughts of killing myself, but I would not carry them out. |
| | 2 | As I look back on my life, all I can see is a lot of failures. | | 2 | I would like to kill myself. |
| | 3 | I feel I am a complete failure as a person. | | 3 | I would kill myself if I had the chance. |

4. 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am discouraged or bored with everything.
5. 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time
3 I feel guilty all of the time
6. 0 I don't feel that I am being punished.
1 I feel that I may be punished.
2 I expect to be punished.
3 I feel that I am punished.
13. 0 I make decisions as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.
14. 0 I don't feel that I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.
10. 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.
11. 0 I am no more irritated by things than I ever am.
1 I am slightly more irritated by things now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time now.
12. 0 I have not lost interest in people.
1 I am less interested in people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.
18. 0 My appetite is no worse than usual. My appetite is not as good as it used to be.
1 to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.
19. 0 I haven't lost much weight, if any, recently.
1 I have lost more than five pounds.
2 I have lost more than ten pounds.
3 I have lost more than fifteen pounds.

- | | |
|--|---|
| <p>15. 0 I can work about as well as before.</p> <p>1 It takes me extra effort to get started at doing something.</p> <p>2 I have to push myself very hard to do anything.</p> <p>3 I can't do any work at all.</p> | <p>20. 0 I am no more worried about my health than usual.</p> <p>1 I am more worried about physical problems such as aches and pains, or upset stomach, or constipation.</p> <p>2 I am very worried about physical problems and it's hard to think of much else.</p> <p>3 I am so worried about my physical problems that I cannot think about anything else.</p> |
| <p>16. 0 I can sleep as well as usual.</p> <p>1 I don't sleep as well as I used to.</p> <p>2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.</p> <p>3 I wake up several hours earlier than I used to and cannot get back to sleep.</p> | <p>21. 0 I have not noticed any recent change in my interest in sex.</p> <p>1 I am less interested in sex than I used to be.</p> <p>2 I am much less interested in sex now.</p> <p>3 I have lost interest in sex completely.</p> |
| <p>17. 0 I don't get more tired than usual.</p> <p>1 I get tired more easily than I used to.</p> <p>2 I get tired from doing almost anything.</p> <p>3 I am too tired to do anything.</p> | |

Appendix 2 Self-reported Mood Questionnaires

Instructions

Please rate how you feel right now on this 9-pointed scale by circling the number, which best represents your feelings at this moment.

For now, I am feeling:

<u>Cheerful</u>	1	2	3	4	5	6	7	8	9	<u>Not cheerful</u>
<u>Confused</u>	1	2	3	4	5	6	7	8	9	<u>Not confused</u>
<u>Sad</u>	1	2	3	4	5	6	7	8	9	<u>Not sad</u>
<u>Creative</u>	1	2	3	4	5	6	7	8	9	<u>Not creative</u>
<u>Unhappy</u>	1	2	3	4	5	6	7	8	9	<u>Not unhappy</u>
<u>Shy</u>	1	2	3	4	5	6	7	8	9	<u>Not shy</u>
<u>Elated</u>	1	2	3	4	5	6	7	8	9	<u>Not elated</u>
<u>Curious</u>	1	2	3	4	5	6	7	8	9	<u>Not curious</u>

Appendix 3 The AMT Cueing Task

Instructions

“Next, you are going to be presented some words, one at a time. Please retrieve a specific memory **AS QUICKLY AS POSSIBLE** in response to each cue word. A specific memory is an event recalled which refers to one particular day, e.g., to the cue word leisure—“playing squash last Friday night” is a specific memory to it. For example, to the cue word lucky, what memory is coming to your mind?” (The prompt “Can you think of a particular time?” is going to be used for ambiguous response.)

Happy

Sorry

Safe

Angry

Interested

Clumsy

Successful

Hurt

Surprised

Lonely

Appendix 3 Ruminant Manipulation

Instructions

For the next few minutes, try your best to focus your attention on each of the ideas on the following pages.

Read each item slowly and silently to yourself. As you read the items, use your imagination and concentration to focus your mind on each of the ideas. Spend a few moments visualizing and concentrating on each item.

Please continue until the experimenter returns.

Think about :

the physical sensations you feel in your body

Think about :

your character and who you strive to be

Think about :

the degree of clarity in your thinking right now

Think about :

why you react the way you do

Think about :

the way you feel inside

Think about :

the possible consequences of your current mental state

Think about :

how similar or different you are relative to other people

Think about :

what it would be like if your present feelings lasted

Think about :

why things turn out the way they do

Think about :

trying to understand your feeling

Think about :

how awake or tired you feel now

Think about :

the amount of tension in your muscles

Think about :

whether you are fulfilled

Think about :

your physical appearance

Think about:

whether you feel stressed right now

Think about :

the long-term goals you have set

Think about :

the amount of certainty you feel

Think about :

your present feelings of fatigue or energy

Think about :

possible explanations for your physical sensations

Think about :

how hopeful or hopeless you are feeling

Think about :

the level of motivation you feel right now

Think about :

the degree of helplessness you feel

Think about :

the degree of calmness or restlessness you feel

Think about:

The possible consequences of the way you feel

Think about :

what your feelings might mean

Think about :

how sad or happy you are feeling

Think about :

the expectations your family has for you

Think about :

why your body feels this way

Think about :

why you get this way sometimes

Think about :

how passive or active you feel

Think about :

what people notice about your personality

Think about :

how optimistic or pessimistic you feel about the future

Think about :

how weak or strong your body feels right now

Think about :

the degree of relaxation or agitation you feel

Think about :

the kind of person you think you should be

Think about :

the degree of control you feel right now

Think about :

what would happen if your current physical state lasted

Think about :

sitting down and analyzing your personality

Think about :

why you turned out this way

Think about :

the things that are most important in your life

Think about :

how quick or slow your thinking is right now

Think about :

the degree of decisiveness you feel

Think about :

trying to understand who you are

Think about :

how you feel about your friendships

Think about :

whether you have accomplished a lot so far

Appendix 4 Distraction Manipulation

Instructions

For the next few minutes, try your best to focus your attention on each of the ideas on the following pages.

Read each item slowly and silently to yourself. As you read the items, use your imagination and concentration to focus your mind on each of the ideas. Spend a few moments visualizing and concentrating on each item.

Please continue until the experimenter returns.

Think about :

and imagine a boat slowly crossing the Atlantic

Think about :

the layout of a typical classroom

Think about :

the shape of a large black umbrella

Think about :

the movement of an electric fan on a warm day

Think about :

raindrops sliding down a window pane

Think about :

a double-decker bus driving down a street

Think about :

and picture a full moon on a clear night

Think about :

clouds forming in the sky

Think about :

the layout of the local shopping centre

Think about :

and imagine a plane flying overhead

Think about :

fire darting round a log in a fire-place

Think about :

and concentrate on the expression on the face of the Mona Lisa

Think about :

the car park at a large supermarket

Think about :

two birds sitting on a tree branch

Think about :

the shadow of a stop sign

Think about :

the layout of the post office

Think about :

the structure of a high-rise office building

Think about :

and picture the Eiffel Tower

Think about :

and imagine a lorryload of apples

Think about :

the pattern on an Oriental rug

Think about :

the “man in the moon”

Think about :

the shape of the continent of Africa

Think about :

a band playing outside

Think about :

a group of polar bears fishing in a stream

Think about :

the shape of Sydney Opera House

Think about :

the shape of Great Britain

Think about :

the way Stonehenge looks at sunset

Think about :

the outlines of the House of Parliament

Think about :

a train stopped at a station

Think about :

a lone cactus in the desert

Think about :

the shape of the country of Italy

Think about :

a row of shampoo bottles on display

Think about :

a petrol station on a major road

Think about :

the fuzz on the shell of coconut

Think about :

the queens' head on a stamp

Think about :

a band playing the National Anthem

Think about :

the shape of a cello

Think about :

the birthmark on Gorbachev's head

Think about :

the shape of the Unites States of America

Think about :

the baggage claim area at the airport

Think about :

the size of the Statue of Liberty

Think about :

the shape of a cricket bat

Think about :

a freshly painted door

Think about :

the shiny surface on a trumpet

Think about :

a kettle coming to boil

Appendix 5 Means-Ends Problem-Solving Procedures

Instructions

We are often challenged by different kinds of social problems in our daily life. Following are some hypothetical problem situations; please list the steps you could take to reach the happy ending, given the problem situation.

Situation 1: You are being treated unfairly by one of your teachers.

(In clinically depressed sample, “boss” replaced “teachers”.)

For the End: You get on with your teacher again.

(In clinically depressed sample, “boss” replaced “teachers”.)

Please write down any thoughts or images that crossed your mind whilst trying to solve the problem.

Situation 2.: Your friends tease you for not socializing enough.

For the End: They respect your choice.

Please write down any thoughts or images that crossed your mind whilst trying to solve the problem.

Situation 3.: You move to a new neighbourhood, don't know anybody.

For the End: You make lots of friends.

Please write down any thoughts or images that crossed your mind whilst trying to solve the problem.

Situation 4.: You have a major row with your parents.

(In clinically depressed sample, “partners” replaced “parents”.)

For the End: You get on with your parents again.

(In clinically depressed sample, “partners” replaced “parents”.)

Please write down any thoughts or images that crossed your mind whilst trying to solve the problem.

Appendix 6 Cover Story

Please picture in your mind the following scenes.

A. The colors of the forest in autumn

Please rate the vividness of the images.

not vivid at all 1 2 3 4 5 6 7 extremely vivid

B. The colors of the seashore in summer

Please rate the vividness of the images.

not vivid at all 1 2 3 4 5 6 7 extremely vivid

Please try to recall the most impressive dream that you had recently.

(Please answer briefly.)

Can you recall it very clearly or it is only a vague impression at this moment?

What does the dream mean to you?"

How often do you have dreams?

Can you easily recall your dreams, or they are forgotten very soon when you wake up?

Appendix 7 Examples of MEPS strategies

Example A:

Here is a response for scenario 2 by a **nondepressed participant**, friends tease you for not socializing enough:

Ask myself why I'm not socializing enough, if they are right.

Am I being reasonable? Too much work to do? Not enough money? Fallen out with a friend? Ill?

Explain reasons to friends, and make steps to go out a bit more.

Example B:

Here is another response for the same scenario by a **depressed distracter**, friends tease you for not socializing enough:

I would explain to them the reasons why I stay in a lot.

I would also go out with them a little more often to let them see I have more fun at home, while also making an effort to socialize.

Example C:

Here is a response for scenario 3 from a **depressed distracter**, moving to a new neighbourhood:

Make an effort: go knocking on your neighbour's doors and introduce yourself, and appear very friendly and cheerful.

Invite neighbours round for coffee, to get to know them better.

Perhaps even have a barbecue or party and invite them all around.

Join societies, perhaps through the church or take part in sporting activities.

Get yourself involved in the community through these groups.

Example D:

Here is a response for the same scenario by a **nondepressed participant**:

Have a few quite weeks setting in, making yourself at home and at the same time

find out what opportunities exist the area (wide area) for socializing.

Continue with whatever hobbies you had where you used to live.

Get to know the people you work with.

Take up something you've always wanted to do, get to know others who do it.

Invite everyone from the work, and the people in your neighbours to your newly decorated house for the house warming, have a nice time.

Example E:

Here is a response for scenario 4 by a **depressed ruminator**, having a big row with a partner:

I'd cry.

I'd probably avoid him for a bit and think things through for a while.

I'd talk things through with him, be nice to him.

I'd apologize if necessary.

We would reach a compromise.

Example F:

Here is a response for the same scenario by a **depressed distracter**:

Have quiet time to clear thoughts and let things cool down.

Walk the dog, visit a friend etc.

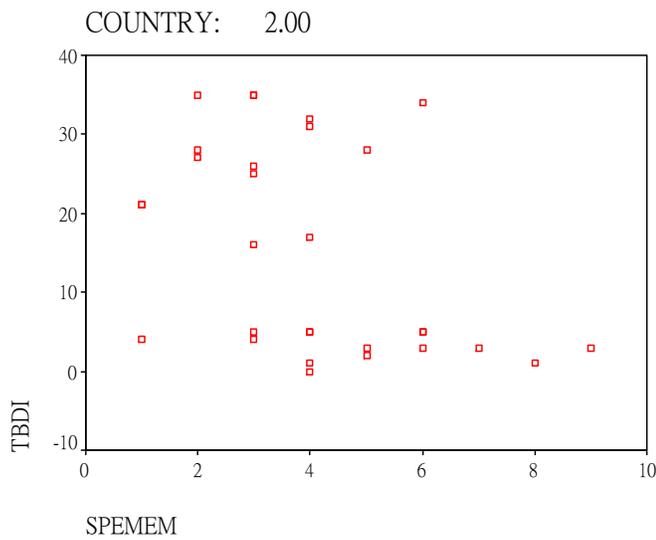
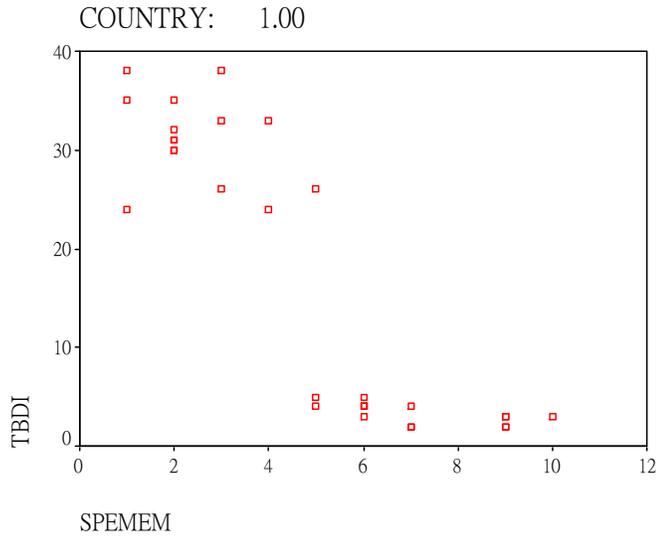
Talk to him about why I think I am right, why he think he is right.

Come to mutual understanding.

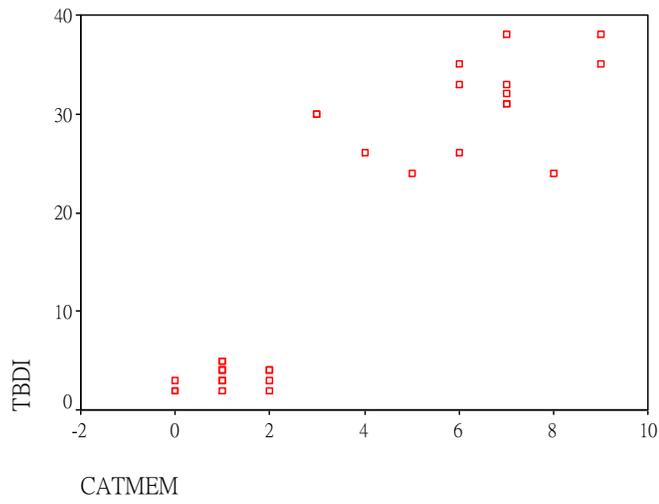
Appendix 8 The scattergram of the correlations for Table 5.3

Country 1: British

Country 2: Taiwan



COUNTRY: 1.00



COUNTRY: 2.00

