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Examining the cognitive theory of depression using Descriptive Experience Sampling

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EXAMINING THE COGNITIVE THEORY OF DEPRESSION USING DESCRIPTIVE EXPERIENCE SAMPLING

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ABSTRACT

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The goal of this study was to examine the experience of depressed and nondepressed individuals, exploring the extent to which the specific constructs identified in Beck's cognitive theory of depression were differentially reflected in the momentary experiences of depressed individuals. This involved recruiting depressed and nondepressed individuals and then assessing their inner experience using both the traditional questionnaire measures developed in accord with Beck's theory and Descriptive Experience Sampling. Depressed participants showed substantial variability in the nature of their inner experience, had less frequent inner speech and more feelings than nondepressed participants. Salient characteristics found in the depressed participants' sampled moments were depressive content, depressive feelings, anxiety content, anxiety feelings, and a propensity for overall negative experiences. Participants' overall scores on the questionnaires correlated with the corresponding rated construct on the following: depressive content, the cognitive triad, and automatic thoughts. Further analyses suggested that these constructs were highly intercorrelated.

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CHAPTER 1

INTRODUCTION

According to the DSM-IV (2000), the main feature of major depression is either an unpleasant mood (feeling sad or irritable) or a loss of pleasure in enjoyable activities. In order to receive a diagnosis of a major depressive episode, symptoms must persist for most of the day, nearly everyday, for at least a two-week period. In addition to the individuals meeting one of the main features, a diagnosis is appropriate if the individual experiences four or more of the following symptoms: significant weight loss or weight gain; insomnia or hypersomnia; psychomotor agitation or retardation; fatigue or loss of energy; feelings of worthlessness or inappropriate/excessive guilt; lack of concentration; or recurrent thoughts of suicide.

According to the World Health Organization (2001) depression currently affects more than 121 million people worldwide. When depressive symptoms are exacerbated it may lead to a person committing suicide. Depression also has a significant monetary effect on society in terms of work related loss of production and health services provided. Greenberg et al. (2003) estimated that the annual workplace cost of major depression due to work absences and productivity reductions in the US labor force is $52 billion. Additionally, $26 billion is spent on health services treating depression.

One of the reasons that so many hours are lost and treatment of the disorder is so costly is that the time to recuperate from the symptoms is extensive. Depressive symptoms usually develop over days or weeks and may last for months at a subsyndromal level before escalating to a full major depressive episode (DSM-IV, 2000). Major depressive episodes are variable in duration. An untreated episode typically lasts four months or longer (Kessler et al., 2003; DSM-IV, 2000). For the most part, individuals who experience a major depressive episode return to normal functioning and have a complete remission of symptoms (DSM-IV, 2000). In about a quarter of the cases, some depressive symptoms may persist but not be serious enough to meet full criteria for a major depressive episode. Some individuals (5%-10%) continue to meet full criteria for two or more years (DSM-IV, 2000).

Epidemiological studies have revealed recently that up to 17% of individuals will experience a major depressive episode at some point in their life (Kessler et al., 2003). One-year prevalence of a major depressive episode was determined to be 6.6% (Kessler et al., 2003). Women are at a significantly greater risk to develop a major depressive episode with studies reporting that episodes occur nearly twice as often in women as in men (Culbertson, 1997; Kessler et al., 2003). Additionally the DSM-IV reports that lifetime risk for Major Depressive Disorder is 10%-25% for women and from 5%-12% for men. Point prevalence has varied from 5%-9% for women and 2%-3% for men. Depressive symptoms can begin at any age, but typically onset is in the mid 20's, often following a severe psychosocial stressor (DSM-IV, 2000).

As a measure of the impact of various illnesses, the World Health Organization has developed the concept of disability adjusted life years. Disability adjusted life years account

for the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability. As it stands, depression is ranked second in terms of disability adjusted life years among 15-44 year olds and is projected to rank second to cardiovascular conditions for all ages by the year 2020 (WHO, 2005). In the year of 1996 there were 1.37 million years lost due to depression in the United States. Additionally, these rates may be higher than what is actually reported because people experiencing other psychological disorders may also have symptoms.

Major depression is highly comorbid with other disorders as evidenced by reports of at least one other DSM-IV disorder being assessed in nearly three-fourths of respondents with a lifetime major depressive disorder (Kessler et al., 2003). The disorders that are mostly associated with major depression are anxiety disorders at a rate of 59% over the lifetime. In addition substance abuse disorders (24%) and impulse control disorders (30%) are often comorbid with a major depression episode (Kessler et al., 2003).

To date, psychological and biological theories have been unable to explain completely how depression develops. One of the leading theories explaining the onset and maintenance of depression is Beck's cognitive theory of depression (1967). This theory posits that negative thinking plays a central causal role to depression. This theory was developed based on cognitive symptoms of depression preceding the affective and mood symptoms of depression. It has been researched and tested over four decades and, as a result, numerous paper and pencil measures (Beck's Depression Inventory; Beck et al. 1961; Cognitive Triad Inventory; Beckham, 1986; Dysfunctional Attitudes Scale; Weissman & Beck, 1978; Automatic Thoughts Questionnaire; Hollon & Kendall, 1980) have been developed to assess the hypothesized cognitive precursors and underpinnings of depression. Components of

Beck's cognitive theory of depression have since been validated primarily with questionnaires involving retrospective memory with participants who are depressed.

The questionnaire methodology is potentially problematic because research has shown that participants who are experiencing psychological symptoms make errors and distortions in their recall of events or feelings (e.g., Lewinsohn & Rosenbaum, 1987; Kalska, Punamäki & Mäkinen-Pelli, 1999; Wells, & Horwood, 2004). Given the inherent limitations of the methods used to validate the cognitive theory of depression, it is desirable to examine this theory using other methods less vulnerable to errors in recall. Descriptive Experience Sampling (DES; Hurlburt, 1990, 1993) is a method that minimizes the retrospectiveness of the recall. DES minimizes the retrospectiveness of the recall by examining random moments of experience soon after they occur. In DES, participants are randomly cued by a beeper to pay attention to particular moments of experience. Then they write down notes about their experience at the moment of the beep and are interviewed about these moments within 24 hours. The goal of these interviews is to develop accurate descriptions of the sampled moments of experience. DES has been used with participants experiencing abnormal psychological symptoms and participants who are not (e.g., Hurlburt, 1990, 1993, Hurlburt & Happe', 1994).

This study will employ Descriptive Experience Sampling to investigate the central components of Beck's cognitive theory of depression. This will involve recruiting samples of depressed and nondepressed individuals and then assessing their experience using both the traditional measures developed in accord with Beck's theory and Descriptive Experience Sampling. This will allow the examination of the extent to which these methods converge or diverge with regard to the nature of experience in individuals suffering from depression.

CHAPTER 2

LITERATURE REVIEW

Cognitive Theory of Depression

Over the past 40 years multiple models have been proposed to explain how people become depressed and continue to experience depressive symptoms over extended periods of time. Examples of these models include the catecholamine (Schildkraut, 1965), cognitive (Beck, 1967), behavioral (Lewinsohn, 1974), learned helplessness (Seligman, 1975), self-control (Rehm, 1977), and ruminative response (Nolen-Hoeksema, 1991) models. However, recent theory and research have increasingly focused on the role of cognition in the etiology, maintenance, and treatment of depression. Beck's cognitive theory of depression (1967) states that depression is activated and maintained by way of distortions in the individual's thinking patterns. These distortions are a result of four different components of a person's thinking. The four components that comprise Beck's theory are depressive self-schemas, cognitive triad of thinking, distortions and biases, and negative automatic thoughts.

Depressive Self-Schemas

According to Beck (1964), a schema is a mental model that allows us to process and organize incoming information efficiently. For example, when a driver comes across a stop sign, the immediate response is to slow down and come to a stop. Instead of having to stop and think "What does the stop sign mean?", the person has stored in his memory

the relevant response sequence. The sequence to apply the foot to the brake and come to a stop is his or her schema for what to do when arriving at a stop sign. This reaction, as well as beliefs and past experiences with stop signs is stored in long-term memory. This memory contains feedback concerning an individual's attributes and abilities triggered by stimuli that set off automatic scripts and behavioral action sequences that help us respond rapidly across situations.

The schemas that are self-focused and unique to the individual are referred to as self-schemas. A reason for repetitive patterns in an individual's thought content is self-schemas. They are not directly observable but are regarded as hypothetical constructs. When stimuli activate a particular schema, the schema abstracts and shapes the raw data into thoughts or cognitions. The content of the schemas are usually in the form of generalizations and represent the individual's attitudes, goals, values, and ideas.

Schemas range in complexity within the individual. When an individual activates his or her definition of what a basketball is they may be able to describe it in simple linguistic categories. However, when dealing with abstract concepts such as an individual's judgment of other's attitudes toward him, the schema may include complex taxonomic systems in addition to structuralized logical elements consisting of premises, assumptions, and syllogisms. For example, a person who has the view that everybody dislikes him will tend to interpret other's reactions based on this assumption. These types of dysfunctional schemas are involved in the inaccuracies, misinterpretations, and distortions involved in psychopathology.

Self-schemas are developed over time in the individual beginning in early childhood (Millon & Blaney, 1999). Once a schema has developed, it becomes ingrained in the

person and is resistant to change (Beck, 1964). In psychopathology, the orderly matching of stimulus and schema breaks down because of the intrusion of hyperactive idiosyncratic schemas (Beck, 1964). Because of their greater strength, these psychopathological schemas tend to displace the more appropriate schemas, resulting in interpretations that deviate from reality (Beck, 1964). Beck theorized that the increasing frequency and degree of cognitive distortion as depression develops might be attributable to the progressive dominance of idiosyncratic schemas. As these schemas become more active, they are capable of being evoked by stimuli that are less congruent with them. So rather than interpreting a certain stimulus the way it is perceived by most in the environment, the negative schema will select congruent information from the stimulus and mold the information to fit the negative schema. The result is a distortion in reality. These negative self-schemas become very strong during depression, dominate the thought processes, and help contribute to cognitive distortions. This helps explain why it is difficult to change a depressed person's rigid pattern of thinking. All types of individuals are susceptible to developing depressive self-schemas.

Depressive self-schemas are activated and developed through social stressors, which contribute to the initiation and maintenance of episodes of psychiatric disorders (Beck, 1967). For instance, a person will encounter a stimulus, which evokes a self-schema, and leads to the specific cognition for the event (Beck, 1964). As an example, John has a strong self-schema about academic tests that represents thinking such as, "I have failed tests in the past and will fail tests in the future." John will likely activate that self-schema when he encounters any testing situation. Once a person has developed a strong depressive self-schema, the schema becomes very resistant to change and may dominate

other schemas that have previously been constructive in a given situation. John, who activates the self-schema of failing academic tests, may activate this same self-schema in other "test" situations such as athletic competitions or meeting new people. Once a pattern of depressive self-schemas overtakes the individual's cognitions for the majority of situations they encounter, it leads to the activation and maintenance of depressive symptoms. In addition to depressive self-schemas being developed, there are usually depressive themes that emerge in the patterns of a depressed person's cognitions (Beck, 1964). These themes take three forms, which are referred to as the Cognitive Triad of Thinking.

Cognitive Triad of Thinking

According to the Cognitive Triad of Thinking theory, a depressed person will interpret their experiences about themselves, their environment, and predictions about the future in a depressive manner, such as personal deficiency, self-blame, and negative expectations (Beck, 1964). Accordingly, people who are experiencing depression regularly feel defeated or deprived in their experiences, feel inadequate, and often see the future as bleak. A number of researchers have conducted studies that suggest these components are in fact an integral part of a person's cognitions.

For example, Slife and Weaver (1992) studied the ability of depressed and non-depressed participants to perform various tasks. They examined three specific tasks: the ability to answer certain types of math problems accurately (cognitive skill); the ability to predict one's ability to answer the problems accurately (metacognitive knowledge about cognition); and the ability to rate accurately one's performance after attempting to answer the problems (metacognitive monitoring of cognitive performance). They found that

depressed participants did worse than non-depressed participants on both types of metacognitive tasks but not on cognitive ability. In other words, depressed participants underestimated their ability to answer problems accurately and after completing the problems, they also tended to underestimate their success.

Bargh and Tota (1988) examined the existence of automatic negative self-referential thoughts in depressed and non-depressed participants by using the concurrent memory load paradigm. Participants judged a series of depressed and nondepressed content adjectives as to whether they described the self or whether they described the average person. An adjective would be presented and one of four types of decisions would be requested: structural (contains a certain letter); semantic (means the same as the word presented); other descriptive (describes average person); or self-descriptive (describes self). During each judgment, half of the participants were required to hold six digits in working memory. The depressed participants who had to hold digits in their memory were found to have greater self-referential judgment latencies for depressed content compared with nondepressed content, whereas the reverse pattern was found for nondepressed participants. While retaining numbers, all participants had smaller latencies on other-referential judgment for nondepressed content adjectives than for depressed-content adjectives. The authors suggest that these results indicate that depressed people exhibit an automatic, unintentional use of negative social constructs in self-perception but not in other perception, suggesting a context dependent form or automatic processing.

Lewinsohn and Rosenbaum (1987) examined whether depressed participants' recall of parental behavior is a stable characteristic that remains even during asymptomatic

periods. Groups of participants included: depressed, remitted depressed who had a history of depression but were not depressed during the study, participants who became depressed during the follow-up period, and never-depressed. The depressed group differed from the nondepressed group in recall of parental behavior. More specifically, depressed individuals recalled their parents as having been more emotionally rejecting. The remitted depressed did not differ from the nondepressed controls in their recall of parental behavior. These results suggest that recall of one's parents as unloving and rejecting is not a stable characteristic of depression-prone individuals, but rather occurs only while depressed. This supports Beck's contention that depressed people have an overly negative view of their environment. More specifically, depressives' negative schemas influence evaluations of parent's behavior.

Andersen, Speilman, and Bargh (1992) studied whether depressed participants make predictions about the future based on pessimistic future-event schema. Participants were undergraduates varying in levels of depression on the Beck Depression Inventory (BDI). Overall, 36 nondepressed, 15 mildly depressed, and 17 moderately depressed participants predicted whether positive (e.g., achieve life goals, listen to music) and negative (e.g., get a fatal disease, go blind) events would happen to them or the average person in the future. In addition, half of the participants were required to hold a number in their working memory. The moderately depressive participant group predicted more negative events and fewer positive events than did other groups and showed greater automaticy in their predictions. The attentional load did not increase depressive participant's response latencies for either type of events, but did for the mildly and nondepressed group.

In addition, Brown, Hammen, Craske, and Wickens (1995) studied the attitudes of college students receiving poorer-than-expected exam scores. Participants were required to complete the BDI and Dysfunctional Attitudes Scale prior to midterm examinations and just the BDI after receiving their grades. The study found that students with high dysfunctional attitudes score coupled with stress (exam) endorsed items consistent with depressive symptomatology. This suggests that the students who are experiencing high levels of dysfunctional attitudes and stress have negative thoughts about themselves (e.g., they do not deserve to be in college), their future (e.g., they may not pass the class), and the world (e.g., they are going to fail all their classes).

Distortions and Biases

As discussed, depressive self-schemas lead to patterns of thinking that are consistent with the cognitive triad of thinking. However, Beck further believed that such self-schemas lead to distortions and biases in cognitive processing. People experiencing depressive symptoms are prone to committing a variety of errors and distortions in cognitive reasoning. Beck identified four general categories of distortions and biases in depressive participants: arbitrary inference, selective abstraction, overgeneralization, and minimization and magnification (Beck, 1964).

Arbitrary inference refers to tendencies to draw negative conclusions without support for those conclusions. A person experiencing depression may exhibit arbitrary inferences in various situations that they encounter in their daily routines. For example, Mary, who is depressed, may incorrectly conclude after a brief conversation with a friend that the friend does not want to chat because Mary is boring and dull.

Another cognitive error identified by Beck is selective abstraction. Selective abstraction refers to cognitions by an individual that focus on the negative in a situation while disregarding the rest of the context. For example, depressed participant Fred may score 99 out of a 100 on a test, but feel and experience failure for missing the one point.

Overgeneralization refers to a tendency to assume that failure at one task predisposes one to fail at all related/similar tasks encountered. For example, Shelly fails the first time she attempts to surf and then assumes that she will never be successful in the future at surfing or any other similar activity such as snowboarding or skateboarding.

Minimizing and magnifying events is another component of the distorted pattern of thinking that has emerged in the depressed individual. Minimizing events refers to the trend for individuals to give themselves little credit for accomplishing a difficult task. For instance, Steven receives an 'A' on a class final, but instead of being elated with his performance, assumes that the test must have been so easy that everyone else received an 'A' as well. Magnifying events is just the opposite. A depressed individual may experience a minor setback but consider it a huge issue. For example, the afore-mentioned Steven does poorly on a minor quiz, but interprets it as a likely indicator that he will fail the class.

Support for these negative bias constructs comes from research that focuses on retrospective recall. Although some of these studies do not fit perfectly with the specific categories, they nonetheless are consistent with what Beck has theorized. Lewis (1995) compared the responses of depressed adolescents to a control group with regard to dysfunctional cognitions (catastrophizing, selective abstraction, personalization, and overgeneralization), perceived social support (family and friend) and stressful events

(negative major events and daily hassles). Lewis found that depressed adolescents reported less perceived family social support, more stressful major events, and more negative personalizing cognitions than the control group.

Gotlib (1981) compared the reactions of depressed and nondepressed psychiatric inpatients with a control group. Participants were administered the BDI, the Hamilton Rating Scale for depression, and a verbal recognition task. The verbal recognition task was designed to elicit participant's recall of self-reinforcements and self-punishments. In general, the depressed and nondepressed inpatients gave themselves fewer self-reinforcements and a greater number of positive reinforcements than did the control group. The depressed and nondepressed group did not differ on those measures. However, when recall of reinforcement and punishment was assessed, depressed participants recalled giving themselves fewer reinforcements and recalled giving themselves greater number of punishments than was actually the case. This differed from the nondepressed and control participants. The author suggested that a low rate of self-reinforcement may be a characteristic of global psychopathology, but deficits in the recall of self-punishment and self-reinforcement were specific to depression. This suggests that individuals suffering from depression selectively abstract details of events that are consistent with their current affect.

Epstein's (1992) study with different levels of constructive thinkers lends support to the overgeneralization concept. He used different levels of constructive thinking because he has found that good and poor constructive thinkers can do as well on the same task. However, he observed that poor constructive thinkers judged themselves more harshly, exhibited more negative affect, and during a recovery period exhibited increased physical

arousal, which was attributed to the intrusion of negative self-attributions. Decreased physical arousal was observed in good constructive thinkers. In addition, Epstein has observed that following unfavorable outcomes, poor constructive thinkers are highly prone to making broad negative attributions about themselves. In his study, he compared answers of three groups of participants differing in general coping ability, as measured by the Constructive Thinking Inventory, to situations that differed according to whether the outcomes were positive or negative and directed at the self or at others. He found that all participants displayed positive overgeneralizations to favorable outcomes, but poor constructive thinkers reported more negative overgeneralizations than others following unfavorable outcomes. In addition, Edelman, Ahrens, and Haaga (1994) studied undergraduates' depression levels over time by monitoring their responses on the BDI and an overgeneralization questionnaire. After a three-week period, they found that the group of people who initially overgeneralized negatively most in response to negative events had more depressive symptoms.

Wenzlaff and Grozier (1988) studied depressed and non-depressed participants to determine how the participants would predict their future success in general based on the results of a test of social perceptiveness. The success or failure on social perceptiveness was predetermined for the participants. The participants indicated the degree they possessed various personality traits and the importance that they possessed various personality traits (social perceptiveness). The results indicated that depressed participants exaggerated the importance of social perceptiveness after learning they had done badly on a test assumed to measure that attribute. In contrast, nondepressed participants inflated social perceptiveness after doing well on the test. Additionally, after learning

they had done poorly on a test of social perceptiveness, depressed participants also believed they were generally less proficient (e.g., successful, skilled, optimistic, positive, competent, intelligent). The results suggest that people experiencing depression magnify negative personal feedback in a way that tends to be self-critical. The authors suggested that these failure experiences lead the individuals to inflate the importance of the failed endeavor. Over time, this tendency could lead to an increasingly large list of important failures, thereby undermining depressed individuals' sense of personal adequacy. The large list of failures could further contribute to the development of a negative self-concept.

Negative Automatic Thoughts

The last component of Beck's cognitive theory of depression is the tendency for depressed individuals to experience excessive negative automatic thoughts, which tend to reinforce their depression. Automatic thoughts are the beliefs and meanings assigned to events. These can be thoughts about worthlessness or hopelessness, or general self-derogatory beliefs or reenactments of past failures or stressful situations. These thoughts may occur frequently in depressed participants and can be difficult to control. Bates, Thompson, and Flanagan, (1999) studied non-depressed patients to determine how repetitive negative thoughts affected them. Participants were randomly assigned to either a depressive or a neutral mood condition. They were asked to read aloud each of 30 negative statements and then to try to feel the mood suggested by the statement. Those who read numerous negative statements about themselves became increasingly depressed. The authors took this as suggesting that repetitive negative automatic thoughts can induce a depressive state within an individual.

Questionnaires for Assessing the Cognitive Theory of Depression

A variety of questionnaires, such as Beck's Depression Inventory (BDI; Beck et al. 1961), the Cognitive Triad Inventory (CTI; Beckham, 1986), the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978), and the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), have been used to measure depressive thinking style and inner experience related to different aspects of Beck's theory of depression. The BDI and the ATQ involve retrospective reports whereas the CTI and the DAS assess present state of mind.

The BDI (Beck et al., 1961) is designed to be a direct reflection of a participant's inner experience. This paper and pencil test is used to assess affective, behavioral, cognitive, and motivational aspects of depression. It is intended for use with adults and adolescents 13 years or age and older. The BDI is not intended for diagnosis, but rather to aid in identifying the presence and severity of symptoms consistent with the DSM (Schaefer et al., 1985; Roberts, Lewinsohn & Seeley, 1991). Participants are to circle the statement that best describes them over the past two weeks. The BDI consists of 21 items and responses are based on a four point Likert scale ranging from zero (e.g., I do not feel sad) to three (e.g., I am so sad or unhappy that I cannot stand it). Total scores of 0-13 are considered minimal range, 14-19 reflects mild depression, 20-28 reflects moderate depression, and 29-63 reflects severe depression. The BDI has changed since its inception in 1961 from a psychologist administered test to a client-administered test in 1978. The BDI was revised in 1996 and renamed the Beck Depression Inventory-II (BDI-II). The BDI has been widely tested for validity and reliability.

The effectiveness of the BDI and BDI-II has been validated by several studies: Richter, Werner, and Heerlein (1998) concluded that the BDI had good content validity; Beck, Steer & Garbin (1988) assessed concurrent validity; Yin and Fan (2000) and Beck and Steer (1984) assessed its internal consistency and test-retest reliability. Storch, Roberti, and Roth (2004) concluded that the BDI-II has also shown good concurrent validity and Sprinkle, Lurie and Insko (2002) measured its test-retest reliability. The BDI has also been shown to be effective with several different cultures in several studies: for example, the Brazilian-Chinese population by Wang, Andrade, and Gorenstein (2005); African Americans by Grothe, Dutton, and Jones (2005); South Africans by Ward, Flisher, and Zissis (2004); Japanese by Kojima, Furukawa, and Takahashi (2002); and Hungarians by Rózsa, Szádóczky, and Füredi (2001). In addition, the BDI has been translated into other languages such as French, Dutch, and Spanish. It has been reliably used with adolescents (Canals, Bladé, & Carbajo, 2001), adults (Beck, 1967), older adults (Steer, Cavalieri, & Leonard, 1999), and clinically diagnosed adults (Johnson, Crofton, & Feinstein, 1996).

While the BDI was designed to measure global depression within an individual, the Cognitive Triad Inventory (CTI; Beckham, 1986) was designed to measure three specific constructs (view of self, world, and future) that are associated with Beck's Cognitive Triad. The CTI is useful for studying the role of the cognitive triad in the etiology and treatment of depression. More specifically, the CTI is used to assess whether there is changes in the cognitive triad relative to changes in depression. The paper and pencil CTI questionnaire consists of 36 items with responses based on a seven-point Likert scale. Participants are asked to fill out the questionnaire according to how they think

"right now." Sample items consist of statements such as "The world is a very hostile place," and "There is nothing to look forward to in the years ahead." Beckham's research in 1986 concluded that initial internal reliability for the subscales was strong (.91 = self, .81 = world, .93 = future). Beckham also concluded that the subscales (view of self, future) have shown strong convergent validity. Anderson and Skidmore (1995) examined whether the CTI did in fact measure three distinct constructs in the cognitive triad. Based on tests of undergraduates, Skidmore confirmed there is factorial validity for Beck's model that considers views of the self, world, and future to be correlated, yet distinct constructs. On the other hand, McIntosh and Fischer (2000) concluded that the CTI only reliably measured one construct - view of the self.

The Dysfunctional Attitudes Scale (DAS), developed by Weissman and Beck (1978), is used to assess excessive and rigid beliefs that can predispose a person to depression. These assumptions and beliefs are thought to reflect the content of relatively stable cognitive schemas (Beck et al., 1991). The DAS consists of 100 items that are rated by participants on a seven-point scale ranging from one (totally agree) to seven (totally disagree). Participants are asked to rate statements that best describe "how they think." Sample items are "I can enjoy myself even when others do not like me," and "What other people think about me is very important." The DAS consists of two parallel 40-item forms (A and B). It takes approximately 5-10 minutes to complete one of the forms. Dobson and Breiter (1983) state that, despite its reduced length, form A provides a comprehensive assessment of dysfunctional attitudes and has replicable factor structure.

The DAS has been found to display sufficient psychometric properties in both psychiatric (Beck, Brown, & Steer, 1991) and college samples (Weissman, 1979). The

DAS has shown good test-retest reliability (Zuroff, Blatt, & Sanislow, 1999), internal consistency (Dobson & Breiter, 1983), and construct validity (Gotlib, 1984). Additionally, the DAS has been successfully translated and shown good reliability and validity in other cultures such as Norway (Chioqueta & Stiles, 2004), Cuba (Carro, Bernal, & Vea, 1998), Sweden (Ohrt & Thorell, 1998), and Germany (Hautzinger, Luka, & Trautmann, 1985).

The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) was designed to measure the frequency of occurrence of automatic negative thoughts associated with depression. More specifically, it is a helpful aid in measuring the actual cognitive ruminations of depressed individuals. Cognitions endorsed by participants evidence elevated levels of syndrome depression. The ATQ is a 40-item self-administered paper and pencil questionnaire with items scored from one (not at all) to five (all the time). Sample items include "No one understands me" and "I'll never make it." The ATQ asks the participant to make a judgment on the frequency that he or she has a specific thought over the past week.

The ATQ has been shown to be a valid and reliable complement in conjunction with other depression measures for a diagnosis of depression in clinical and nonclinical samples (Harrell & Ryon, 1983; Cao, Chen, & Tang, 1999). It has shown high internal consistency (Dobson & Breiter, 1983), concurrent validity (Clark, 1988; Dobson & Breiter, 1983) and high sensitivity and specificity in discriminating depression from other psychological disorders (Hill, Oei, & Hill, 1989; Cao, Chen, & Tang, 1999). In addition it has been successfully translated into Norwegian (Chioqueta & Stiles, 2004), French

(Charles 1989) and Turkish (Sahin & Sahin, 1992) forms that showed good reliability and validity.

Methodological Issues in the Measurement of Thinking

As we have seen, Beck's cognitive theory of depression suggests that errors or distortions in thinking play a central role in the onset and maintenance of depression. We have reviewed a number of questionnaires that have been developed to assess the thinking constructs identified by Beck's theory as playing an important role in depression. However, there is substantial research that calls into question the extent to which people can accurately characterize their thinking as requested on instruments such as the BDI, CTI, DAS, and ATQ. In this section, I discuss this research and the general methodological issues one should consider when trying to understand the nature of people's cognitive processes.

Since the beginning of the science of psychology there has been substantial research and interest in understanding people's cognitive processes. Psychologists have attempted a number of methods to capture people's conscious mental activity, such as introspection and, more recently, retrospective self-report questionnaires.

Introspective research involves asking people to report on their thoughts, feelings, and sensations under natural or contrived circumstances. In the late 19th century, researchers tried many different ways to obtain accurate reports of thinking, such as cataloging mental elements (Titchener, 1909) and mental chronometry (Wundt, 1862/1961). Cataloging mental elements was an attempt at providing a psychological analogy to the periodic table of elements in chemistry. Mental chronometry is the

measurement of the speed of various psychological processes. However, introspection failed to gain acceptance in the mainstream due to events such as the failure of leading psychologists of that era to agree on imageless thoughts (Danzinger, 1980). Therefore introspection was abandoned and the study of mental life lay dormant for decades.

Behaviorism arose because it limited psychological study to overt behavior that could be easily quantified and measured. Behaviorism dominated the field of psychology for much of the early and mid 20th century until cognitive psychologists showed that learning and conditioning could not account for all cognitions. For example, Chomsky (1959) claimed that language could not be learned solely by operant conditioning because people could generate words that had never been spoken before. Behaviorism eventually lost favor to cognitive science. So once again the field of psychology became interested in finding ways to measure cognitions.

Cognitive science has developed a variety of ways to explore cognitive processes, but these methods generally do not include introspective self-report. However, cognitive theories developed or residing within the realm of clinical psychology, such as Beck's cognitive theory of depression, do employ self-reports to assess the nature of cognitive processes.

The BDI, CTI, DAS, and ATQ, the primary tools used to measure the cognitive processes in Beck's cognitive theory of depression, are retrospective self-reports questionnaires. They ask respondents to make judgments about their thoughts and feelings. Essentially they are asking participants to make estimates about the extent that they experience certain cognitions over a specific period of time, hold specified beliefs, or experience specified feelings. Sample items from these questionnaires include "If I

fail at my work, then I am a failure as a person," "I am so sad or unhappy than I can't stand it," and "I feel so helpless." These statements are straightforward and similar to thoughts and statements that would be explored by clinical psychologists. However, accuracy issues arise when asking participants to make judgments about the nature and frequency of their cognitions (Hurlburt, Heavey, & Seibert, 2006). These issues can be divided into those related to memory and those concerning measurement procedures. Memory issues arise during the encoding, storage, and retrieval stages. Potential procedural measurement problems include demand characteristics, reactivity, and ecological validity. I will address each of these issues in turn.

During the encoding stage, a problem that may occur is the target information may not have been sufficiently encoded during this stage thus making it difficult to advance to long-term memory. This in turn becomes problematic for later retrieval of the information. This may be due to not paying attention to the event or possibly experiencing competing cognitive information at the time of encoding. If information is encoded, there are a numerous types of errors that people's memories are susceptible to in the encoding stage such as: perception, focus, expertise, and understanding (Haber & Haber, 2000). For example, with regard to perception of an event, if a participant does not have adequate visual acuity, he or she may not be able to report accurate details of the event and reflections of the event may be based on conclusions of what "must" have happened. Parallel problems may occur with the recall of inner experiences if the details of the experience were not sufficiently attended to be recalled clearly; specifically individuals may then "fill in the blanks" using their beliefs or other available information.

In terms of focus during encoding, attention is allocated to activities of greatest interest to the participant. In general, people can have fairly broad attention range. However, some aspects of events cause involuntary narrowing of attention and as a result other parts of the event are not attended to at all. Thus a person may not have sufficiently encoded all the details of an event, but rather only what they focused on or attended to. Furthermore, if a person has a certain amount of expertise related to an event, it may affect his or her ability to encode information as well. Specifically, individuals lacking experience with a person, object, or event, generally observe less detail, are less likely to describe distinctive features, and are less likely to make a correct identification later (Haber & Haber, 2000).

Another problem with encoding is the beliefs and expectations the participant uses to organize and understand the event being observed. Bartlett (1932, cited in Haber & Haber, 2000) read descriptions of logically ordered and unordered events to participants. He found that participants could remember and repeat the logically ordered event with some accuracy, but not the unordered event. This was construed as indicating that individuals have difficulty encoding and remembering events that are inconsistent with their expectations. Thus, there are a number of issues that can interfere with the encoding of an event.

In the storage stage of memory, difficulties may arise due to memory capacity and decay. People do not have a limitless amount of information that can be received, processed, and remembered (Miller, 1956). Miller found that regardless of elements (e.g. digits, letters, words) people retained around seven plus or minus two elements of information in their short-term memory. Since his study, other researchers have proposed

retention levels of less than seven elements in short term memory (Cowan, 2001). Factors affecting the ability to encode, store, and recall new information include rehearsal (Atkinson & Shiffrin, 1968), processing (Craik & Lockhart, 1972) and lexical status of the contents (Hulme et al., 1995). In addition, storage is influenced by things such as the primacy effect. The primacy effect involves information presented earlier in a series being more likely to be recalled than information presented later because the time available for rehearsal or processing of new material decreases as information continues to be presented.

With regard to memory decay, studies involving memory have shown that people experience rapid loss of details following an event (Rubin & Wetzel, 1996). As time increases relative to the occurrence of the event, the accuracy of the recalled details becomes even worse (Bernard, Killworth, Kroenfeld, & Sailor, 1984). Tourangeau's (2000) attempt at providing a mathematical formula related to retention of information as a function of time led to the conclusion that forgetting increases monotonically over time, but it occurs rapidly at first then slows down. Additionally, Hurlburt (1984) concluded that when people rate their experiences after a delay, they tend to intensify their experiences by exaggerating their ratings of irritation, anger, vividness, and clarity. This body of research suggests that people's ability to accurately recall information after an extended delay must be looked at with skepticism. To minimize error associated with memory decay, researchers should attempt to obtain details of participant's experiences as soon after the event as possible.

The retrieval stage of memory is the process of getting information out of memory. Retrieval is often enhanced by prompts that include associations, contexts, or mood.

During the retrieval stage of memory, errors that can occur with regard to answering retrospective self-report questionnaires are types of memory accessed - semantic versus episodic (Tulving, 1984, 1993) - and biasing effects of state-dependent memory and mood-congruent memory.

Accuracy when answering a question depends on the type of memory that is prompted by the question or task. When retrieving an answer, people will access either semantic or episodic memory (Robinson & Clore, 2002). Semantic memory is the memory for knowledge or generalizations for events, free of time and place. For example, if Benny asked how Matthew was feeling over the past month, Matthew would likely access memory associated with his self-theory, an instance of semantic memory. Episodic memory is the memory of an event that has specific time, place, and experiential details, such as emotions. For example, if Jessica asked Shannon how she is feeling after their recent lecture, Shannon could presumably recall the specific moment and place as well as the emotions associated with it.

The BDI and ATQ prompt participants to answer questions over a period of time ranging from one to two weeks. Tulving (1984, 1993) explained that characterizations of experience over time are more likely to rely on semantic memories. This is problematic for recall because of potential distortions involved in semantic memory. Robinson and Clore (2002) provided a review differentiating between emotion (episodic, contextual) and beliefs about emotion (semantic, conceptual). In their review, contextual details of events can aid in recall of emotions. However, as time lapses, recall of contextual details declines which may cause random and systematic retrospective biases. Once details are lost, the memory of an emotion shifts from episodic memory to semantic memory. As

semantic memory takes over for an event, other retrospective biases may be come involved, such as belief-consistent bias.

Beliefs about emotion can have direct effects on retrospective reports, leading to incongruence between feelings at the time of experience versus estimations of those feelings at a later date. For example, McFarland and Ross (1987) tracked romantic relationships over a two-month period. Participants were asked about their perceptions of their relationship at the beginning and at the end of the period. At the second report they were asked to retrospect on their feelings two months earlier. Participant's retrospective reports were systematically biased in the direction of their current perceptions.

Robinson and Clore (2002) also stated that people's ability to access their episodic memory declines greatly after a week, so any question that prompts a response later than a week will rely on semantic memory for the answer. The BDI asks a participant to report about their feelings over the past two weeks, likely accessing their semantic memory. Methods that invoke episodic memory are ideal in minimizing errors associated with retrieval of memory. More specifically, methods that target recent, specific, clearly identified moments will minimize biases associated with semantic memory, such as self-theory bias, confirmation bias, and pre-existing schemata (Hurlburt, Heavey & Seibert, 2006).

The effects of state-dependent memory can also influence the accuracy of responses to questionnaires. Extensive research has shown that people's memory for events can be affected by the state that they are in at time of testing. The physical surroundings (Eich, 1980), internal physiological state (Eich et al., 1975), and mood (Eich, 1995) of the individual can influence what he or she may recall. In terms of physical surroundings,

people who study in a certain area have shown better recall for details if they are tested in the same area than if they were tested in a different area (Saufley et al., 1985). The internal physiological state has also been shown to influence people's memories. For example, Eich et al. (1975) administered marijuana to participants in four different conditions: encode under marijuana placebo-recall placebo, encode placebo-recall under marijuana, encode under marijuana-recall under marijuana, and encode under marijuana-recall placebo. Overall, the placebo-placebo group scored the highest. However, results showed that people who encoded material while under the influence of marijuana recalled more material when they were under the influence of marijuana during recall compared to people under the influence during encoding but not under the influence during recall.

Another type of memory that influences recall is mood-congruent memory. Studies have reported that people who are in a depressed state tend to recall prior negative emotions (Denny & Hunt, 1992) and self-referential material (Beck, 1967; MacLeod & Matthews, 1991) as being more frequent than what actually occurred. Thus a participant who is feeling depressed while completing a self-report questionnaire will tend to endorse more mood congruent items and may rate items relating to negative affect as more frequent and more severe than actually experienced. In addition, by comparing the results of clients completing a measure of symptomatic distress prior to enrolling in therapy and after terminating therapy with those of a control sample, Safer and Kueler (2002) found that participants who were enrolled in counseling overestimated their pre-therapy stress. Specifically, distress levels were lower than previously indicated, giving the illusion of more positive change over time. As discussed earlier, Lewinsohn and Rosenbaum's (1987) study of depressed participants' recall of parental behavior showed

that current level of depression significantly affected characterizations of how loving and rejecting parents were.

The effects of mood-congruent memory do not only occur with people who are experiencing psychopathology. Research with so-called normal samples has shown that depending on the person's current affective state, a participant may bias his or her perception of past states (Natale & Hantas, 1982). The BDI and ATQ ask for participants to characterize their experience over several weeks of time, thus participants may be reporting inaccurately on items because of their current mood. Additionally, the DAS and CTI may be prone to mood congruent memory bias because they prompt subjects to respond to questions targeting their beliefs related to their self-concept. Specifically, responses to items on these questionnaires would likely be different for participants when they are feeling depressed compared to when they are in a happy mood.

Thus memory errors in the encoding, storage, and retrieval stages can influence the accuracy of participant's responses. Errors arising from measurement procedures may be important as well when trying to obtain accurate reports of experience.

Procedural measurement issues include demand characteristics, reactivity, and ecological validity. Demand characteristics can distort research results. Demand characteristics are cues that the researcher may give that may indicate to the participant what the researcher wants to find. Participants may give in to the demands of the experimenter rather than answer accurately. A researcher's conduct, appearance, or type of questioning may cause the participant to guess the rationale of the study and therefore to work purposefully to confirm the experimenter's hypothesis. The interviewer can influence the way the participant responds by the type of questioning and nonverbal

feedback as evidenced in eyewitness memory reports (Weinberg, Wadsworth, & Baron, 1983). Cassel et al. (1996) showed a theft of a bicycle on a video to participants in three conditions: unbiased questioning; requesting specific information without suggesting an answer; and questioning suggesting an answer. They reported that participants were more influenced by questions that suggested an answer, concluding that the group was influenced by the demand characteristics of the interviewer. Some of the possible features that create demand characteristics are age, sex, ethnicity, accent, appearance, social status, and personality traits.

Social desirability bias can be a problem for self-report questionnaires as well. Social desirability is when the participant responds to a question in what he or she believes is a socially acceptable manner (Fisher, 1993). When confronted with sensitive topics, respondents may be unwilling to report answers accurately for ego-defense or impression management reasons (Fisher, 1993). Prior studies have found that social desirability can affect variable relationships (Zerbe & Paulhus, 1987); increase measurement error (Cote & Buckley, 1988); and affect the means of variables (Peterson & Kerin, 1981). Thus demand characteristics and social desirability are important to consider when conducting research involving self-reports.

Another methodological issue that must be considered when using the BDI, CTI, ATQ, and DAS is participants' reactivity to those measures. Reactivity involves participants being influenced by the measurement instrument such that they behave or respond in a way that does not really represent the way they would naturally behave. A classic example of reactivity would be people behaving differently because they realize that they are being observed. Questionnaires can also produce reactivity. Knowles and

Byers (1996) identified three sources of reactivity: within measure context effects, meaning clarification, and self-referencing.

Within measure context effects suggest that subsequent responses are influenced by responses on previous items. This raises the question whether participant's responses are due to the items serial position or the participant's actual emotional state. Knowles (1988) reported the participant's responses are influenced by the item serial position and not by differences due to specific items.

Tourangeau and Rasinski (1988) identified four stages that participants experience in the inquiry-response of self-report questionnaires: comprehension and meaning of question; assembling relevant information (e.g., salient events, interactions, self-characterizations); judgment by integrating relevant information; and finally a response that is tailored to the format of the question. They concluded in their study that the earlier stages of this process have the potential for producing measurement reactivity.

Items can be open to various interpretations of meaning. Crutchfield and Gordon (1947) concluded that often differences in respondents' answers reflect differences in the interpretation of the question more than differences in the state of self. Participants can also be influenced by implicit meanings of items that emerge spontaneously, without effort (Uleman, 1987). Additionally, interpretations of items at the beginning of a test can contribute to the meaning of later items (Bargh & Pratto, 1986).

Self-referencing can be reactive to having self-report questionnaires ask respondents to relate the content of the question to their self-concept. This essentially creates greater depth of processing of information related to self-referential material. Once the self-concept is activated it may prime other aspects of self-evaluation (Bargh & Pratto, 1986).

This increased processing of self-evaluations may lead to more associations, elaborations, and integration of the content of the inventory (Burnkrant & Unnava, 1989), essentially leading to greater polarization and more consistency among later items. Thus, participant reactivity is of concern when answering items on the BDI, ATQ, CTI, and DAS. Methods that may minimize participant reactivity should be as open-ended as possible, while not invoking processes that go beyond the capture and report of the experience (Hurlburt, Heavey & Seibert, 2006).

A problem that is difficult to overcome with self-report questionnaires is ecological validity. In order for a study to possess ecological validity, the methods, materials, and setting must approximate the real-life situation (Brewer, 2000). Self-report questionnaires are usually not done within the context of the participant's environment. According to Hurlburt (1997), the typical experiment is not ecologically valid because it attempts to provide one condition that is identical all participants. To maximize ecological validity, researchers should test participants in their environments while disturbing them as little as possible. Self-report questionnaires do not generally test people in their natural environment.

Methods that do not minimize the error associated with memory and procedural measurement issues should be looked at with caution because of the concerns discussed above, however they can be valid. The BDI, ATQ, CTI, and DAS are vulnerable to these methodological concerns in their measurement of cognitions. Are there better methods that minimize the memory errors as well as errors associated with procedural measurement issues, such as demand characteristics, reactivity, and ecological validity? There are several methods that have been developed in the last three decades that strive to

address these methodological issues. Sampling methods may overcome some of these problems that are associated with memory and procedural errors because these method asks participants to respond within seconds of an event in their natural environment. So rather than having a significant amount of time elapse between an event and reporting about it, participants will be beeped and then report their experience within seconds, thus reducing errors associated with memory and other procedural concerns. In the next section, I will discuss some of the methods that explore inner experience while attempting to address the methodological concerns reviewed above.

Methods that Minimize Measurement Errors

As a result of the significant methodological errors associated with self-report questionnaires, researchers have designed other strategies to gain insight into inner experience. Some of these strategies include methods focused on accessing cognitions (think aloud, articulated thoughts during simulated situations, and thought sampling), whereas others have different or broader emphases (experience sampling method, ecological momentary assessment, and descriptive experience sampling).

Think Aloud

The think aloud method is designed to help the researcher understand the content and process of a participants' cognitions. Typically the procedure involves participants' speaking about what they are thinking while participating in a task. Responses are recorded and subsequently used to determine the content of the thoughts. The thoughts are collected without probes or leading questions. This avoids prompting the participant to provide explanations for their behavior (Meichenbaum & Cameron, 1981). The

primary advantage of the method is that it avoids retrospective and memory biases because the data is collected immediately as the cognitions are occurring.

Thus far the think aloud method has not been used specifically to evaluate Beck's theory of depression, though several studies with people who were experiencing dysphoria (Conway, Howell, & Giannopoulos, 1991; Mayo & Matsumi, 1996) and depression (Barnhofer, de Jong-Meyer & Kleinpaß, 2002) have been conducted.

Conway, Howell, and Giannopoulos, (1991) examined dysphoric individuals' suppression of unwanted thoughts. Participants consisted of 21 dysphoric and 21 nondysphoric people over two studies. In study 1, participants were given either failure or success feedback on a test. After the feedback, they were asked not to think about the feedback while participating in a five-minute think aloud procedure. Dysphoric participants had more thoughts of failure and fewer thoughts of success compared to nondysphoric participants. In addition, during the final minute of the procedure, dysphoric subjects in both feedback conditions had more intrusions of failure than the nondysphoric participants. In study 2, participants were asked not to think of the neutral target "white bears." Again, dysphoric participants had more intrusions of the target "white bears" in the final minute then did the nondysphoric participants. Based on these results the authors concluded that dysphoric participants demonstrated evidence for the mood-congruence hypothesis and cognitive-effort hypothesis, which proposes that dysphoric participants will be less successful at suppressing thoughts of any kind during the later stages of a suppression period compared to nondysphoric participants because they have reduced cognitive effort.

Mayo and Matsumi (1996) examined self-statements of dysphoric and nondysphoric participants while completing an interpersonal problem-solving task. Participants consisted of 13 dysphoric and 15 nondysphoric people. They were shown a videotape of an interpersonal problem (relationship breakup) and asked to solve the problem while speaking their thoughts. Participants' answers were coded in five categories: task facilitating, task inhibiting, emotion-focused, problem-focused, and periods of silence. Results showed that dysphoric participants generated as many effective solutions as did nondysphoric subjects. However, during problem solving, dysphoric participants gave fewer problem focused statements and more emotion-focused statements. The frequencies of emotion-focused self-statements correlated negatively with the socially coded score of solution effectiveness.

Barnhofer, de Jong-Meyer, and Kleinpaß (2002) investigated whether depressed participants show consecutive retrievals of categoric memories. Categoric memories are statements that are overgeneral by virtue of referring to generic summaries of events. During a think aloud procedure 15 depressed and 15 nondepressed participants were asked to verbalize all thoughts. The procedure consisted of participants remembering details of an autobiographical event during which they were given two positive and two negative cue words. The authors coded the number of different events and event descriptions (categoric, extended, or specific). Depressed participants had more categoric memories and fewer specific memories. The authors concluded that depressed participants tend to produce sequences of consecutive categoric memories rather than specific memories, indicating that this process may contribute to an overgeneralizing retrieval style.

Articulated Thoughts during Simulated Situations

Articulated Thoughts during Simulated Situations (ATSS; Davison, Robins, & Johnson, 1983) is a paradigm that attempts to understand peoples' cognitions through highly structured, experimentally controlled situations. This paradigm allows open-ended verbal responding rather than retrospective reports. Experimenters are able to specify and manipulate situations as well as produce different states of emotions. It is very cost and time effective. In a typical study, participants are presented with an audio recording of a conversation simulating a complex event. Participants are asked to pretend that the event is actually happening and that they are part of the situation. Participants are told to verbalize out loud their thoughts that they are having as the situation occurs. The audiotape plays for about 15-25 seconds and then the participant responds for about 30 seconds. This sequence is then repeated multiple times and responses are recorded for further analysis.

To date, few studies have used ATSS with depressed individuals. White, Davison, and Haaga (1992) explored cognitive bias in the articulated thoughts of depressed and nondepressed psychiatric outpatients. They put participants in negative (rained on the day of a barbeque), neutral, and positive audio taped simulated situations. Depressed participants exceeded nondepressed participants in cognitive bias in the negative simulated situation. This finding provided support for the method as well as an aspect of Beck's cognitive theory of depression.

Thought Sampling

Thought Sampling is another form of research that attempts to gain insight into participants' daily experiences. The goal is to quantify characteristics or aspects of

thinking (Hurlburt, 1997). Typically, participants are given a beeper and are requested to rate their thought contents on a series of Likert scales. Participants are beeped at random intervals. As a result of the unpredictability of when a beep will occur during a participant's day and immediacy of reports, thought sampling overcomes some of the problems with retrospective recall and improves ecological validity.

To date, thought sampling has not been used often with participants who are experiencing depression. Josephson, Rose, and Singer (1999) used thought sampling with depressed and nondepressed participants and correlated it with the Beck Depression Inventory. Participants were beeped randomly for a fifteen-minute period and asked to speak their thoughts aloud. The results showed that participant's mood correlated with thought content. In addition, thought content correlated with the Beck Depression Inventory. Depressed participants were found to have more overall negative thought content than nondepressed participants.

Ecological Momentary Assessment

Ecological Momentary Assessment (EMA) uses a sampling strategy of obtaining multiple momentary assessments to describe a person or process (Shiffman & Stone, 1998). Sampling strategies can include event-contingent, interval-contingent (fixed times), and signal-contingent (response to audible signal) prompting. To gather data, EMA uses handheld computers (also called PDAs). Handheld computers help the researchers detect if a participant decided to fake the time of a diary entry. Additionally, the handheld computers can minimize participant's errors involving skipping questions or providing answers that are ambiguous. Furthermore computerized entries reduce the sense of intrusiveness that may be experienced in interviews (Bendtsen & Timpka, 1999).

To date, only one study has explored depressed participants with the EMA method. Biller (2005) attempted to identify the response pattern of individuals with depression while undergoing psychotherapy. Participants included 41 depressed participants and 30 controls. The depressed participants were divided into two groups consisting of 12 and 29 participants. The group with 12 participants engaged in EMA, which included the handheld computer. However, only 3 participants out of the 12 completed the study. Reasons for the high dropout rate consisted of termination of psychotherapy, not completing the study requirements, therapist request, and software problems. The remaining 3 participants were prompted twice a day for a six-week period to record their cognitions and mood. Participants were expected to rate 30 statements on a Likert scale. In addition, participants filled out the BDI-II three times over the six-week period. The other group of 29 depressed participants and 30 normal participants were only required to fill out the BDI-II and a paper and pencil questionnaire that consisted of the same items as the handheld computer one time. No common patterns emerged within the three depressed participants' responses to positive and negative affect nor did they find a reduction in negative affect in response to the amount of therapy participation. They concluded that using EMA could help in individualizing treatments and help in identifying factors that may influence therapeutic progress, though compliance may be difficult to obtain.

Experience Sampling Method

Experience Sampling Method (ESM; Csikszentmihalyi, 1983) is a quantitative approach to introspection. The method requires participants to fill out self-assessments in their natural settings. These self-assessments address things such as cognitions,

emotions, symptoms, motivation, and activities. In addition, participants usually describe their physical and social context. To reduce retrospective error, participants are required to respond to questions after they have been beeped. The beeper is designed to go off during semi-random intervals of approximately 90 minutes. Often a participant is required to respond to 10 beeps for six consecutive days. Once completed, statistical analyses are performed to help interpret the results.

Although there have been quite a few studies that have utilized ESM to examine participants who are experiencing depression (Kraan et al., 1992; Merrick, 1992; Mokros, 1993; Barge-Schaapveld, Nicolson, & Berkof, 1999; Myin-Germeys et al., 2003; Peeters, Nicholson & Berkhof, 2003; Peeters, Nicholson, Berkhof, & Delespaul, 2003), there have been only a few studies that have specifically examined a theory of depression (Hopelessness-Helplessness; Swendsen, 1997, 1998, 2000) and only one study that has explored Beck's cognitive theory of depression (Swendsen, in press).

Kraan et al. (1992) explored the use of ESM as a supplement to conventional assessment methods such as the Diagnostic and Statistical Manual. Participants consisted of 16 newly admitted depressed patients, six individuals with depression in remission, and four normal controls. For six consecutive days, 10 times per day participants were triggered by a pager and requested to fill out a series of Likert-scale items and open-ended questions. Items were chosen by a panel of clinical and research experts. Items concerning major depression were selected from the DSM-III-R and Research Diagnostic Criteria. In addition survey items also included questions from the Zung Depression Scale, BDI, Hamilton Depression Rating Scale, Plutchik-van Praag's Depression Inventory, and Carrol Scale. Depressed participants were found to have more variability

in negative mood compared to controls. Recent onset and remitted depressed participants were unable to be differentiated with regard to negative mood factors. However, the ESM procedure allowed the author of this study to differentiate these groups with regards to positive mood factors.

Merrick (1992) attempted to explore the topography of everyday experience including everyday moods and situations of depressed participants. Eighteen participants participated in the study and were divided into three groups: currently depressed (CD), previously depressed (PD), and normal controls. Participants completed the ESM procedure consisting of eight beeps per day. Participants completed questions that were specific to depressive symptoms such as the experience of negativity, causal attributions of events, and dysphonic mood (sad, lonely, grouchy, angry, bored, and pleasure). Severity of dysphoria was analyzed on three different axes: frequency, intensity, and duration. Sadness, loneliness, boredom, and anhedonia were experienced more frequently in the depressed samples compared to the normal controls. With regards to intensity of depressive symptoms, CD reported the most dysphoric, while PD reported the least dysphoric. CD were reported to spend more time at home and less time in public places compared to the other groups. CD spent most of their time in the living room. In addition, the CD group spent less time engaging in productive activities such as schoolwork or job. CD spent significantly more time alone. Of note was that in the 239 beeps that were collected, there was not one beep where a CD participant was in the company of only one member of the opposite sex. Of the time spent with friends, CD's spent only 4% of their time with more than one member of the opposite sex.

Mokros (1993) examined the relation between single-time-point clinician-based judgments and multiple-time-point self-reports for three essential symptoms of depression (sadness, irritability, and anhedonia). He hypothesized that the role of communication in the diagnosis of mental disorders cannot be confined to the study of interpersonal interactions alone. Participants consisted of seven depressed adolescents and 14 healthy adolescents. Participants were signaled eight times on seven consecutive days to complete the Random Activities Survey (RAIS). More specifically, they noted time of day, physical location, who they were with, what they were doing, and rated items on the RAIS via a series of 7-point Likert scales. A clinician interviewed the participant prior to engaging in the study and immediately following completion. During the clinical interview, depressed participants reported prominent and persistent sadness; however during ESM, sadness was not reported to be any different than that of healthy participants. In addition four out of the seven depressed participants reported irritability at a rate less than what was expected via the clinical evaluation. Two participants judged to be pervasively anhedonic by clinical evaluation failed to show evidence of anhedonia during their ESM ratings.

Barge-Schaapveld, Nicolson, and Berkof (1999) examined the contribution of mood states, physical complaints and enjoyment of activities to a momentary measure of quality of life (mQoL). The authors hypothesized that mQoL would fluctuate more widely in depressed participants than in healthy control participants. Participants consisted of 63 depressed and 22 healthy participants. Participants completed a self-report after each beep, 10 times for six consecutive days. At each beep, participants rated their mQoL ("In general, how is it going with you right now?"), current mood, physical

complaints and enjoyment of activity on 7-point Likert scales. In addition, participants completed retrospective measures of global quality of life, mood, physical complaints, enjoyment of daily activities and depressive symptoms. Depressed participants had lower levels of mQoL, positive mood, and enjoyment of activity, higher negative mood, and more frequent and severe complaints. Depressed participants were more likely to be doing nothing and less likely to be engaged in work compared to controls. In addition, depressed participants had more variability in mQoL over time than controls. The authors concluded that mQoL can help explain the impact of depression on daily functioning and well-being.

Myin-Germey et al. (2003) investigated emotional reactivity to minor stressors in the daily lives of people who are experiencing depression. The intent of the study was to determine if there is in fact an increase in emotional reactivity between people who are experiencing psychosis and people who are not. The study consisted of 42 people with non-affective psychosis, 49 healthy controls, 38 with bipolar, and 46 with major depressive disorder. Participants were given a watch that would beep 10 times for 6 consecutive days. When beeped, participants completed a self-assessment form concerning thoughts, current context, appraisals of the current situation, and mood. Participants rated mood and stress items on 7-point Likert scales. Participants who were in a current depressed episode had significantly higher negative affect and lower positive affect than did all other groups. Furthermore, type of mood indicated a difference in emotional reactivity. Bipolar participants had decreases in positive affect in response to stress while depressed participants had significantly larger increase in negative affect in responses to stress when compared to controls.

Peeters, Nicholson, Berkhof, and Delespaul (2003) explored the effects of daily events on mood states in participants who were experiencing depression. They hypothesized that severity of depressed episodes would influence mood reactivity to daily events. Additionally, they hypothesized that duration of current episode of depression and a history of previous episodes of major depression would increase reactivity in negative affect and positive affect with regards to negative events as well as decrease reactivity of both mood states to positive events. They compared 47 depressed participants to 39 healthy participants. Depressed participants were included in the study based on a prior DSM-IV diagnosis, Symptom Checklist-90 scores, and high scores on the BDI. Participants were requested to fill out self-reports of mood and events 10 times each day for six consecutive days. Mood assessment was assessed by 16 adjectives (e.g. irritated, guilty, happy) on a series of 7-point Likert scales. In addition, participants were asked to describe at the moment of the beep any positive and/or negative event that may have taken place since the last beep and to rate the event(s) on the same Likert scales. Positive events were rated on the dimensions of pleasant, important, and stressful, while negative events were rated on the dimensions of unpleasant, important, and stressful. Participants who were depressed did not report more frequent negative events but did report fewer positive events compared to healthy participants. Negative affect in response to negative events lasted longer in depressed participants.

Recent biological research with participants who are experiencing depression has focused on abnormal cortisol levels. It is thought that abnormal levels of the hypothalamic-pituitary-adrenal axis related to stress has a part in the pathophysiology of major depression. Peeters, Nicholson, and Berkhof (2003) attempted to determine if

levels of cortisol among 47 depressed participants compared to 39 healthy participants were related to negative and positive daily events. In addition, the authors examined the influence of clinical characteristics and gender differences in cortisol responses to events, as well as mood changes. Participants were requested to fill out self-report questionnaires of mood and events and simultaneously provide saliva samples 10 times each day for six consecutive days. When faced with a negative event, healthy participants had increases in cortisol levels, while depressed participants showed no increase. Depressed participants who have a history of mood disorders showed even less increases in cortisol levels when facing a negative event. Women who were depressed tended to show larger cortisol responses to negative events than men who were experiencing depression. Furthermore, negative affect tended to be less closely associated with cortisol levels in depressed participants.

ESM has also been used to explore the Hopelessness-Helplessness theory of depression. This theory postulates that once a negative event has occurred, the individual determines if the event is within their control. In addition the individual determines the degree to which the cause of the event is internal, stable, and global. The theory views anxiety and depression as both being characterized by helplessness, but that only depression is characterized by hopelessness. Hopelessness cannot occur without helplessness, therefore anxiety symptoms are common within depression syndromes. Anxiety is the initial mood reaction to a negative event and in turn can make the individual experience hopelessness if they view the event as stable and global. It is also stated that individuals with depressogenic attributional styles should be more likely to attribute negative events to stable and global causes; therefore be more likely to

experience hopelessness depression. Swendsen (1997) categorized 44 participants into two groups consisting of attributional styles at low or high risk for depression. Participants were signaled five times a day for a one-week period. At each signal they completed an experience sampling form that contained measures of daily life events, attributions, and state anxious and depressed moods. Results for the most part supported the theory. Individual attributional (e.g., depressogenic) style predicted the momentary causal attributions. Support for the Hopelessness-Helplessness theory also came from the finding that hopeless causal attributions for minor negative events predicted changes in residual depressed mood. Following negative events, causal attributions of globality and stability explained increases in depressed mood. These results differentiated between anxiety and depression, consistent with the theory's assertion that negative outcome expectancy is unique to depression. Swendsen was unable to find support for the assertion that helplessness expectancy should consistently predict anxiety.

Swendsen (1998) used the ESM to examine idiographic and cross-situational data in hopes of validating components of the helplessness-hopelessness theory. Ninety-one participants participated in the study. They were required to fill out a questionnaire five times a day for seven days. He assessed their attributional and perception of control styles via questionnaires. At each beep participants filled out a self-report form concerning their experiences of anxious and depressed moods, daily life events, and specific attributions made to these events. Swendsen was unable to find a link between attributional and perception of control styles with regard to negative events predicting immediate depression. However, attributional and perception of control styles was predictive of causal attributions and perceptions of control across the daily flow of

environmental contexts. Furthermore, specific causal attributions of negative events explained fluctuations in depressed mood over and above individual's daily experience. Results also supported a highly specific timeframe for testing theories of depression. More specifically, stable and global causal attributions had their greatest influence immediately after the negative event and subsequently influenced mood for typically up to six hours afterward.

Swendsen (2000) examined the cross-cultural validity of the Helplessness-Hopelessness theory using ESM with participants from France (90) and the United states (43). Participants were signaled five times a day for one week. The participants were asked to report negative events (Inventory of Small Life Events), attributions, and depressed moods (BDI). Participants would then evaluate the event that had the biggest impact on them as well as its degree of negativity. This would involve providing answers on 7-point Likert scales regarding the event's stability, globality, and internality. Swendsen reported that there were differences between cultures concerning the average severity of daily negative events, depressed moods, and causal attributions. More specifically, French participants tended to be more negative about their daily negative events, but attributed fewer causal attributions to themselves compared to the Americans. Level of depression did not vary across the cultures.

Swendsen (in press) used ESM to compare the hopelessness theory and Beck's theory with regard to depressed mood in daily life. He hypothesized that depressed attributional styles would predict more negative causal attributions to negative events throughout the day and, as a result these specific attributions, would be associated with increases in depressed mood. In addition, he hypothesized that sociotropic individuals (high levels of

dependence and excessive need to please others) would experience more depressed mood following a negative interpersonal event, whereas autonomic individuals (self-governing, independent) would experience more depressed mood following a negative achievement related event. Based on cognitive vulnerabilities and substance use frequency, 179 participants were selected for the study. Participants filled out self-report questionnaires regarding mood, attributional style, and daily events when beeped. Swendsen reported that attributional style and sociotropy were indirect determinants of depressed mood. In addition, attributional style and sociotropy supported causal mediation and specificity. More specifically, although the sample as a whole experienced an increase in depressed mood following a negative event, the association was much stronger with sociotropic individuals. Sociotropy did not have a direct effect on depressed mood in general, but did affect the person's mood following a negative social event. Autonomy was not found to have an effect on depressed mood. Additionally, atrtibutional style was found to predict the differing levels of specific attributions to the variety of negative events experienced in daily life. The momentary cognitions were in turn able to explain the variance in depressed mood. The hopelessness theory was able to explain a larger portion of variance in depressed mood overall than Beck's theory.

Descriptive Experience Sampling

Descriptive Experience Sampling (DES; Hurlburt, 1990, 1993) is a method for developing high fidelity descriptions of inner experience. It involves asking participants to wear a random beeper in their natural environment. Participants are instructed to pay attention to whatever is in their awareness at the moment immediately prior to the beep. Participants are then asked to jot down notes about the characteristics of their experience

at that moment in a notebook. After collecting a certain number of moments (usually five or six beeps) the investigator conducts an intensive expositional interview. This interview is conducted within 24 hours of when the beeps are collected. The participant is asked to describe the experience at the moment of each beep and to collaborate with the interviewer to understand the details of the experience. The interviewer strives to gain an accurate apprehension of the experience while limiting presuppositions. In addition, the interviewer works collaboratively with the participant to develop descriptions of the experience that are as true to the original experience as possible. Participants have the freedom to withhold experiences that they consider to be too private to talk about. They are encouraged to think of themselves as co-researchers in the investigation. Once the experience has been sufficiently explored, the interviewer summarizes the moment to the participant and inquires if there is anything else that was missed or if the summary of the experience was not exactly precise. Sampling with each participant usually occurs over four to eight sessions and the first day is usually considered training for the participant and descriptions from it are generally not used. After collecting a sufficient number of moments of experience, the DES investigator will attempt to identify salient characteristics of the individual.

DES, therefore, is an idiographic procedure that attempts to characterize one individual's experience. In addition, DES can also be used to examine the inner experience of participants who have similar characteristics (e.g., psychiatric diagnosis). When used in this manner, a number of individuals with a shared characteristic are sampled. Idiographic profiles of each individual are developed. These idiographic

profiles are then examined to determine if there are shared characteristics across individuals. This can allow for nomothetic characterizations of common experiences.

The primary difference between DES and other sampling methods is that DES is only focused on the participant's inner experience as it naturally occurs to them. ESM picks aspects of awareness and other aspects of experience, such as social or environmental context and activity as the focus of investigation a priori. In addition, ESM ask subjects to report on these dimensions using a structured format. Sometimes ESM does not investigate the participant's actual thinking, but rather measure their mood, quality of life, and physical concerns. Furthermore ESM may use a Likert rating scale to measure the items of interest. DES does not ask the participant to pay attention to their environment or physical attributes unless that is what the participant reports that they are experiencing at the moment of a beep. Additionally, DES provides qualitative descriptions rather than quantitative analysis (Hurlburt, 1997).

There have been only a handful of studies with participants who are experiencing depression using the method of DES. Hurlburt (1993) explored the inner experience of individuals with affective disorders. Three of the participants had varying levels of depression and one participant experienced hypomanic periods. Five characteristics stood out: unsymbolized thinking and affect, relation of inner perceptual clarity and affect, inability of depressed individuals to distinguish perceptual from conceptual descriptions of inner experience, inconstancy of the perceiver in depression, and the prevalence of emotional processes outside of awareness. Each of these characteristics will now be described in more detail.

The first characteristic noted was that the frequency of inner symbolization decreases as depression increases. Thus the frequency of words and images decreased while the frequency of unsymbolized thinking increased as depression increased. For example, participant Michelle experienced symbols (inner speech or images) most of the time during nondepressed periods, however when experiencing dysphoria she had increases of inner experience consisting of partially unworded experiences and unsymbolized thinking.

The second observation was that inner perceptual clarity decreased as depression increased. For example, participants when not depressed were able to report more details of events, especially when they were experiencing a visual image. However, when depressed, all the participants described internal visual experiences without much clarity. This suggests that depressed participants were experiencing cloudiness or that the inner perception process becomes unclear.

The third characteristic observed was that depressed participants had difficulty in discriminating perceptual description from conceptual description. More specifically the three depressed participants reported seeing an inner image, but when probed carefully the experience was revealed not to be an image at all. For example, depressed participant Susan described a picture of her therapist on her wall, but after being queried about the details of the picture, she was unable to describe them. This may indicate at the moment she had difficulty in telling the difference between a cognition and perception.

The fourth characteristic observed was the inconstancy of the perceiver, as the participant reported having distinctly different mental states associated with different thoughts. For example, participant Diane usually experienced inner speech in her head,

but when depressed she occasionally experienced inner speech in other parts of her body such as her stomach. Hurlburt concluded that individuals, when depressed, might not have a clear, stable platform from which to view their own experiences.

The fifth observation was that participants experienced emotional processing outside of awareness. For example, participants reported the frequent existence of emotional processing in their physical bodies, but didn't recognize these emotions in their awareness at the moment of the beep. For example, participants who were feeling sad or agitated throughout their body often were not aware of those feelings.

Of note with the three depressed participants were that all the participants were able to recognize that their affect was changing, but unable to recognize that their cognitions were also changing with changes in their affect.

Perlotto (2001) explored the inner experience of participants who were experiencing depression. Eight participants participated in the study with three participants who were labeled depressed and five participants who were controls. Each participant completed six beeps per session for approximately five sessions. The most salient characteristics of the depressed group were feelings, sensory awareness, and unsymbolized thinking. However, the results did not differ much from the control group whose samples contained mostly feelings, sensory awareness, and images. Of note, the depressed group tended to have more multiple experiences per beep compared to the control group and a higher percentage of feelings per sample. The depressed group also had a much greater rate of negative than positive feelings (4:1 ratio) compared to the control group (1:1 ratio).

Cavenagh (2003) explored attributional styles in participants via DES. The study consisted of three participants who had a very high negative attributional style and three

who had a non-negative attributional style. Each participant was beeped six times a day for four days. Each beep was coded for evidence of the cognitive triad, attributional style, negative valence, and rumination by the authors. The operational definition for the cognitive triad was an overly pessimistic view of oneself, one's world, and one's future. The operational definition for negative valence was a thought or emotion that has a negative tone. Out of the six participants, two were determined to be at high risk for depression (one from each group). The depressed participants' high scores on the cognitive triad compared to the low scores among the other four participants provided support for the cognitive triad. In addition, the two high risk-depressed participants evidenced the highest frequency of negative valence (a thought that has a negative tone). Additionally, the two depressed participants had more experiences of sensory awareness and infrequent images compared to the other four participants.

Although each of the methods reviewed in this section is able to address some of the methodological concerns relevant to understanding inner experience, DES addresses these concerns most comprehensively. Memory decay and the potentially biasing influence of state-dependent memory are reduced by the short interval between event and recording of the event. DES targets episodic memory because it targets specific, clearly identified moments, thus reducing the errors associated with semantic memory. Errors associated with memory capacity are reduced because DES is interested in only brief moments (one second or less) of experience. Participant reactivity is minimized because the method does not try to invoke processes that go beyond the capture and report of the experience, as well as allowing the participant to report the experience without restrictions. Ecological validity is maximized in the DES procedure because participants

are sampled in their natural environment. Demand characteristics are minimized by the researchers attempt to not ask leading questions. DES interviewers also are trained to ask questions that do not involve presuppositions. Thus DES is a procedure that can effectively minimize errors associated with retrospective self-reports. This study will employ DES to investigate the central components of Beck's cognitive theory of depression. This will allow the examination of the extent to which findings from DES converge with those obtained from commonly used questionnaires.

CHAPTER 3

METHOD

This study consisted of three phases: a screening phase to identify possibly suitable candidates, a qualification phase to determine if candidates were suitable for the study, and a sampling phase in which I explored the inner experience of individuals who are and who are not suffering from depression.

Screening Phase

Overview

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a demographic questionnaire, and an informed consent form were administered to undergraduate students taking an introductory psychology course during the Spring, 2007 semester at the University of Nevada, Las Vegas. Based on the results of the CES-D, students identified as either moderate or severely depressed, or not depressed were invited to enter the qualification phase.

Participants

The participants in this phase were made up of 133 Spring, 2007 University of Nevada, Las Vegas undergraduate *General Psychology* students. Students who agreed to participate in the screening phase were given one half hour of psychology research participation credit. Participants included 73 males and 60 females. The average age of

the participants was 20.18 years. Sixty-seven percent of the participants were employed and 98% were single. The ethnicities of the participants were 8% African Americans, 17% Asians, 55% Caucasians, 19% Hispanics, and 1% Middle-Easterners.

Instrument

The demographic questionnaire consisted of name, address, phone number, cell phone number, age, race, sex, marital status, education level, medication, counseling status, and employment status.

The CES-D (Radloff, 1977) is a 20-item self-report questionnaire. It is designed to screen for symptoms of depression as well as to measure change in symptom severity over time. Participants rated how much each statement describes how they felt during the past week on a Likert scale ranging from zero to three. The total score ranges from 0 to 60. The cutoff for differentiating depressed from nondepressed participants is 16. The total completion time for the test is generally under 10 minutes. Radloff (1977) has provided norms and psychometric properties for the CES-D as follows. With regard to internal consistency, coefficient alpha ranged from .85 to .90. The stability of the measure over a range of two to eight weeks was found to be between .51 and .67. The measure has correlated highly with other depression scales such as the Beck Depression Inventory and the Zung Depression Scale, indicating good convergent validity.

Procedure

At the beginning or end of a class period, the researcher briefly described the study, obtained informed consent, and asked students to complete the demographic questionnaire and the CES-D in exchange for psychology research credit. Participants scoring at or above 16 on the CES-D were subsequently contacted for participation in the

qualification phase. In addition, students in the lowest quartile of CES-D scores were contacted to participate in the next phase.

Qualification Phase

Overview

The students involved in the qualification phase participated in a more detailed, thorough assessment of depression involving the use of a semi-structured clinical interview. Those found to meet diagnostic criteria for major depression disorder or no significant depression was invited to participate in the sampling phase of the study.

Participants

Undergraduate students with the highest and lowest scores on the CES-D were invited to participate in the qualification phase. Participant recruitment in this phase was not random. Participants were contacted until six participants had qualified and agreed to participate in the sampling phase. Approximately twenty people were invited to participate in the depressed sample. Two people declined to participate over the phone, while the others did not return a phone message left by the researcher. Participants were given one hour of course research credit for their participation in the qualification phase. Of the eight participants that were interviewed for the depressed group, six qualified for the study. The average score on the CES-D for the depressed group was 30.75. Approximately eight people were contacted to participate in the control sample. Three of those participants contacted did not return a phone message left by the researcher. Of the five participants who were interviewed for the control group, four qualified for the study.

The average score on the CES-D for the control group was 3.20. Participants consisted of nine men and four women. The average age of the participants was 24.31 years.

Instrument

The mood disorders modules of the Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID; First, Spitzer, Gibbon, & Williams 2002) is a semi-structured diagnostic interview designed to assist clinicians, researchers, and trainees in making reliable DSM-IV psychiatric diagnoses. A person who meets criteria for a psychiatric diagnosis can take between one to two hours to complete the full-length interview of the SCID, while a person who does not meet criteria for any diagnoses can complete the interview within 30 to 90 minutes. However, only the mood disorders module of the SCID was administered, so participants were able to complete the interview within thirty minutes to one hour. The SCID has been shown to be a reliable and valid measure for a diagnosis of Major Depressive Disorder (Zanarini, et al., 2000, Zanarini, et al., 2001). More specifically, Zanarini et al. (2000) found correlation coefficients for test-retest reliability for a 7 to 10 day period was .61 and interrater reliability was found to be .80.

Procedure

The SCID was administered to each of the students who met the screening criteria, agreed to participate, and executed an informed consent form. Those who met diagnostic criteria for major depressive disorder and those who showed no symptoms of major depression were invited to participate in the sampling phase.

Sampling Phase

Overview

Six participants confirmed in the qualification phase as having met diagnostic criteria for major depression disorder were invited to participate in Descriptive Experience Sampling (DES) along with four nondepressed control participants. Each participant was provided with the appropriate beeper apparatus and instructions on how to record their inner experience.

Participants

Six undergraduate students who met diagnostic criteria for major depression disorder according to the SCID participated in the sampling phase. In addition, four undergraduate students from the initial screening and qualification populations who did not show symptoms of depression participated as the control group for the sampling phase. The depressed group consisted of four men and two women. The control group was made up of three males and one female. The average age was 25 years for the depressed group and 18.25 years for the control group. The participants consisted of seven employed students. The ethnicities of the participants were two Asians, six Caucasians, and two Hispanics. The sample consisted of six freshman, two sophomores, one senior, and one seeking a second degree.

Instruments

The Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is paper and pencil test designed to assess affective, behavioral, cognitive, and motivational aspects of depression. It is intended for use with adults and adolescents 13 years of age and older. The BDI-II is not intended for diagnosis, but rather to aid in

identifying the presence and severity of symptoms consistent with the DSM. The BDI-II consists of 21 items and responses based on a 4-point Likert scales ranging from zero (e.g., I do not feel sad) to three (e.g., I am so sad or unhappy that I cannot stand it). Total scores of 0-13 are considered to reflect minimal depression, 14-19 reflects mild depression, 20-28 reflects moderate depression, and 29-63 reflects severe depression. The BDI-II is the most widely used measure for depression and has very good psychometric properties including test-retest reliability (r = .93; Beck, Steer, & Brown, 1996) and internal consistency (alpha = .91; Dozois, Ahnberg, & Dobson, 1998).

The Dysfunctional Attitudes Scale Form A (DAS; Weissman & Beck, 1978) consists of 40 items that are rated by participants on a 7-point scale ranging from 1 (*totally agree*) to 7 (*totally disagree*). Sample items include "I can enjoy myself even when others do not like me," and "What other people think about me is very important." It is used to assess excessive and rigid beliefs that can predispose a person to depression. The DAS displays sufficient psychometric properties in both psychiatric (Beck, Brown, & Steer, 1991) and college samples (Weissman, 1979). The DAS has shown good test-retest reliability (Zuroff, Blatt, & Sanislow, 1999), internal consistency (Dobson & Breiter, 1983), and construct validity (Gotlib, 1984). The DAS has been shown to have a high interrelationship with the BDI (Ilardi, 1995).

The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) is a 40-item self-administered paper and pen questionnaire designed to measure the frequency of occurrence of automatic negative thoughts associated with depression. Research has shown the ATQ to be valid and reliable in conjunction with other depression measures for a diagnosis of depression in clinical and nonclinical samples (Harrell & Ryon, 1983;

Cao, Chen, & Tang, 1999). It has shown high internal consistency (Dobson & Breiter, 1983), concurrent validity (Clark, 1988; Dobson & Breiter, 1983) and high sensitivity and specificity in discriminating depression from other psychological disorders (Hill, Oei, & Hill, 1989; Cao, Chen, & Tang, 1999). The ATQ has been shown to have a high correlation with the BDI (Harrell & Ryon, 1983and a moderate correlation with the DAS (Dobson & Breiter, 1983).

The Cognitive Triad Inventory (CTI; Beckham, 1986) was designed to measure the three specific constructs (view of self, world, and future) associated with Beck's Cognitive Triad. The CTI is specifically used to assess whether there are changes in the cognitive triad relative to changes in depression. The CTI questionnaire consists of 36 items with responses based on a 7-point Likert scales. Beckham's research concluded that initial internal consistency for the subscales was strong and that the scale has strong convergent validity. The CTI has been shown to have a high correlation with the BDI (Maldonado, Luque, & Herrera, 1999).

Apparatus

Participants were given a portable beeper with an earphone. The beeper is programmed to give a 700-Hz tone at random intervals ranging from immediate to one hour with a mean length of thirty minutes. In addition, participants were given a pocket-sized notebook in which to record notes about their inner experience at beeped moments.

Procedure

Participants were contacted via email or phone to take part in the sampling phase. Participants were asked to come to an initial meeting at the experience-sampling lab. During this meeting the investigator explained the study including possible benefits of

participating, the procedure, and the required time commitment. If the participant was interested in taking part in this phase, they were told about the limits of confidentiality and that they can discontinue the study at any time. Furthermore, participants were asked to provide informed consent.

Once the informed consent had been completed, participants were given instruction on the DES procedure. They were informed how to operate the beeper and wear the earphone. More specifically, they were shown how to turn the beeper on and off, adjust the volume, and reset the beeper by pressing a button. In addition, participants were given a pocket-sized notebook and instructed to jot down notes on their inner experience after each beep. Participants were asked to collect six beeps during their normal daily activities within twenty-four hours of the scheduled expositional interview. They were instructed to write down in their notebook what was in their inner experience right before the beep went off. In addition, participants were allowed to decline discussion of any beeps that they did not feel comfortable sharing. Once the instructions had been completed and questions about the procedure had been answered, participants were asked to fill out the BDI-II, CTI, DAS, and ATQ. After the participant had finished completing the questionnaires, the investigator set up the first meeting for an expositional interview.

Within 24 hours after the participant had collected six beeps the investigator conducted an expositional interview. The participants took part in this interview at the experience-sampling lab. The interview lasted for one hour and was videotaped if the participant had consented to videotaping. The investigator then carried out the interview. Dr. Heavey was present for eight of these interviews. During this interview, the

participant was asked to describe the experience at the moment of each beep and to collaborate with the interviewer(s) to understand the details of the experience. After six moments of experience had been discussed, the investigator then set up another meeting time with the participant. The participant took part in three more interviews. Within 24 hours after completing the interview, the investigator wrote up a summary of each moment of experience. The investigator then reviewed the descriptions with Dr. Heavey. The investigator and Dr. Heavey coded the presence of the five most common phenomena of inner experience (inner speech, inner seeing, unsymbolized thoughts, sensory awareness, and feelings) in each beep. Approximately 10 disagreements in codes were resolved via discussion.

Following the fourth expositional interview, the investigator debriefed the participant about the nature of the study. Debriefing consisted of describing the goals of the project, commonly occurring experiences, and answering any question the participant had.

The data were examined in two ways. First, after each participant completed the sampling phase, the investigator examined all the sample descriptions for that participant to determine what, if any, characteristics were salient in that individual's inner experience. The investigator then wrote a description of the nature of that individual's inner experience, describing any salient characteristics and attempting to convey the character or nature of that person's inner experience. Once all of these individual profiles had been prepared, the investigator examined the extent to which there were commonalities or differences in the nature of the inner experience of the participants and the extent to which any identified commonalities or differences corresponded to group

membership (i.e., depressed group versus control group) or any other identifiable characteristic of the individuals.

The second way in which the data were examined involved rating the character of the beeps related to the extent to which the experience at the sampled moments did or did not reflect aspects of Beck's cognitive theory of depression. To accomplish this, four research assistants rated the extent to which the written description of the experience at each moment, reflected the following five constructs:

1) Depressive Content – The presence of affective (i.e., depressed mood, worthlessness, guilt), behavioral (i.e., withdrawal, agitation), cognitive (i.e., difficulty concentrating, thinking, or making decisions), or physical (i.e., insomnia or hypersomnia, fatigue) aspects of depression.
2) Cognitive Triad – A negative view of the self, world, or future.
3) Dysfunctional Attitudes –Attitudes such as negative conclusions without support; a focus on negative content in a situation while disregarding the rest of the context; assumptions of failure in the future; and distorted patterns of thinking involving minimizing positive aspects of self or experiences or inflating the importance of negative aspects of the self or experience.
4) Automatic Thoughts - Thoughts about worthlessness, hopelessness, past failures, or general self-derogatory beliefs or statements.
5) Valence – The overall negativity versus positivity of the experience.

The first four constructs were rated using a scale ranging from 0 (*not at all*) to 6 (*extremely*). The valence construct was rated using a scale ranging from -6 (*extremely*

negative) to 0 (*neutral*) to 6 (*extremely positive*). The rating instruction sheet can be found in Appendix A.

The final rating instructions were developed through multiple revisions by Dr. Heavey and the researcher. The initial operational definitions of the constructs were developed based on a short summary of the constructs. Using these initial operational definitions, 30 random beeps were rated by a fellow psychology graduate student. Based on the feedback from the rater and a review of these initial ratings the operational definitions were modified. Following modifications, another 30 random beeps were chosen and given to a psychology graduate student, Dr. Heavey, and the researcher to rate. Interrater reliability analysis between the three raters demonstrated sufficient reliability. The last concern addressed was that the constructs appeared to have high intercorrelations. In order to minimize the potential for halo effects to increase the intercorrelations among the constructs, Dr. Heavey and the researcher decided to have the raters rate only two constructs at a time.

Three UNLV undergraduate psychology students and one UNLV psychology graduate student served as raters. The raters were instructed to rate the written descriptions of the moments based on the construct definitions provided for them. Raters were given two randomly chosen constructs at a time to rate for all 237 moments of experience. The 237 moments were randomly ordered for each rater. A sample of the moments can be found in Appendix B. Once the rater had completed the ratings for the first two constructs he or she was assigned, he or she was given two more constructs. This process was repeated a third time with the final construct.

Intraclass correlation coefficients were computed for each rating dimension to determine if the ratings of the descriptions of the moments of experience were sufficiently reliable. These analyses are analogous to computing a Cronbach's alpha for each construct except that intraclass correlation coefficients also consider absolute agreement. Thus this is a more stringent test of inter-rater agreement than Cronbach's alpha. Each of the four ratings was treated as one item in the rating scale. The intraclass correlation coefficients for each of the five rated constructs were as follows: Depressive Content = .82; Cognitive Triad = .78; Dysfunctional Attitudes = .74; Automatic Thoughts = .74; Valence = .95, establishing that there was sufficient agreement between the raters to consider the ratings reliable.

CHAPTER 4

RESULTS

Individual Participant Profile

The following are idiographic profiles of each participant. Depressed participants are presented first, followed by nondepressed participants. Within group they are ordered from highest BDI-II scores to lowest.

Table 1: Percentage of Moments Rated as Being Present in the Participants Experience

Participant	Depressive Content	Cognitive Triad	Dysfunctional Attitudes	Automatic Thoughts	Negative Valence
Depressed					
Derek	25	21	8	8	42
Sheila	38	46	33	42	58
Sterling	57	44	61	65	70
Matt	58	42	21	46	79
Charles	26	22	22	22	30
Brooke	42	17	13	21	29
Nondepressed					
Aaron	33	25	29	21	33
Jared	13	21	13	13	54
Jessica	0	17	4	13	38
Trent	4	17	9	4	26

Note: to be present, a moment had an average rating of 1 or higher. Negative Valance

Depressed Participant #1: Derek (all names have been changed)

Derek is a 23-year-old Caucasian male living with his parents. He is a student working on courses to complete his undergraduate degree. He reported that he was doing well in school. He stated that he was in the midst of a long bout with depression. While on a mission, as a requirement for his religion, he broke down because of the stress he experienced. Therefore, he came home before completing the mission and has since struggled with depression. Derek claimed to be less depressed since returning from the mission.

Over the course of his sampling days he often watched TV, worked on his computer, and played video games. For instance, in successive moments he was watching TV, watching TV, and working on his computer. Descriptions of these beeps are as follows: during the first moment he was watching TV in his bedroom. He was flipping through channels and ended up on the series called *Workout.* He was feeling anxious which was associated with the sensation of "butterflies" in the left side of his stomach. He was watching a scene of girls being touchy feely. During the second moment, he was watching the *Real World Challenge-Inferno 3* on Television. Some guy had just gotten punched in the face on TV. He was feeling annoyed/tense. He was thinking you don't do that to other people and that he doesn't understand why someone would do that. He was also thinking that it was stupid for the guy to be punched in the face. He was noticing the redness of the cut underneath the actor's eye. Finally, during the third moment, he was sitting at his chair and trying to get his computer set up. He was attempting to reinstall Windows Vista. He was feeling a sense of focus that was

experienced as good and relaxed. He was looking at the computer screen and noticing the blues/greens/and grays of the dialog box.

He had only one moment in which he was interacting with another person. During this particular moment, he was yelling to a friend who was far away. He was trying to get his attention. He was yelling the word "Loren," in a moderately loud voice. He knew that he was trying to get his attention and that his goal was to get his attention and this was experienced as an abstract idea in his head.

The most common forms of Derek's experience were sensory awareness (67%) and feelings (46%). Often he was seeing colors (44%) in his sensory awareness moments. For example, at one moment he was in a classroom looking at a girl's sweater in front of him. He was noticing the yellow, green, and light green colors of the sweater. He was looking at the contrast and depth of the colors. He was seeing the back part of the sweater and not her shoulders. He was also hearing noise around him that was loud and he knew that the noise was caused by people talking.

Of note is that the left side of his stomach was frequently (42%) experienced in his moments. For example, he was in his classroom sitting down. He had just received his test score back. He was experiencing a feeling of excitement. He was happy and shocked for receiving a 100 on the test when he was thinking that he was not going to do well on the exam. He was also sensing adrenaline in his stomach on his left side that was intense. It felt like a burst of energy the size of a cantaloupe and was warm. More than half of those stomach moments (60%) were experienced as a sensation or feeling of pain. For instance, he was driving in his car and feeling his stomach cramping. He was noticing an oscillating dull sensation on the left side of his stomach about the size of a

baseball. He was thinking and recognizing that it was hurting him. He could also hear radio noise at a low volume.

With regard to feelings, he experienced depression-related feelings in 25% of his beeps. These feelings accounted for more than half of his feeling moments (55%). For example, in one moment he was standing in his room. He was feeling his stomach hurting. There was a cramping sensation about the size of a softball that was experienced as a dull pain. It was more pain than usual. He was feeling stressed out and it was making him tense. He was feeling a sense of worry and anxiety throughout his body. He felt queasy and that his muscles were contracting. He was also thinking that he didn't want his stomach to hurt because he had two tests to take. This thinking was occurring without words or images.

During many moments Derek seemed to be experiencing anxiety. Forty-six percent of his moments contained some form of anxiety. For example, he was getting ready to leave his house. He was walking in his hallway and was looking to pick up his keys. He had a feeling of being in a moderate hurry. He knew that he needed to pick up the pace, to walk fast, and to get all the tasks done. He was also thinking about the routine that he was doing in order to leave the house. He was thinking about a step-by-step procedure of getting his backpack, finding his keys, putting on his shoes, and then walking out the door. All the steps were in his experience and he was on the keys step in his head.

Throughout the four interviews Derek rubbed his eye when he was asked questions or answering questions. He would do this for at least 5-10 minutes during each interview. He did not seem to notice that he was doing it. It appeared that this was a nervous habit. However, it was reflected in only one moment. During this moment he was playing

video games on his Gameboy. He had just put the Gameboy down and was scratching his eye. He was rubbing the lower left eyelid with his left hand. He was noticing the roughness and rubbing against the eyelid and eyeball. It was experienced as a slight pressure. He knew in his head to scratch his eye.

Overall, Derek's experience was filled with frequent sensations and feelings. Most of his experiences took place while he was participating in isolated activities. In addition, he frequently experienced depressive or anxious content in his moments. Lastly, he experienced the left side of his stomach in almost half of his moments.

Depressed Participant #2: Sheila

Sheila was a 19-year-old Indian female studying biology as preparation for applying to medical school. She reported that she was doing well in school but that she was very stressed by the difficulty of her classes. She lived with her family. She was in the midst of a depressive episode, which she believed was caused by her friend's recent suicide. Sheila has had difficulty coping with the tragedy. She experienced a previous depressive episode when she was younger.

Most of Sheila's moments of experience involved thinking either in the form of images (33 %) or unsymbolized thoughts (33%). She frequently was engaged in an internal debate that might be considered mixed feelings or an internal struggle. For example, Sheila was in her room sitting on her bed thinking about the idea of quitting school if/when her investments start to pay off. This was a complex thought about the eventuality that might materialize if she is successful with investing money that would free her up to quit school and be rich. Mixed together with this thought was her sense of her need to not get too excited about this possibility and the realization that she wouldn't

be able to quit school until she was actually successful enough with the investing to give herself a secure future. This idea had a positive sense or feeling accompanying it that seemed like a somewhat remote experiencing of the happiness she thinks she would feel if she was successful with her investing.

In another example, she was in her room thinking about a trip to India. She was thinking about finding an Indian "boy." She was feeling excited and optimistic, but also scared and disappointed throughout her body. She felt scared and disappointed because she didn't want the boy to come to America and have to give up his customs, which she believed would be a huge transition. She thought he might be depressed if he were to come here. She was also experiencing a mental image of herself being on an auto rickshaw with her family in the back. Four family members were in the back of the vehicle. She was looking out to the left and seeing shops that were not modernized. The scene looked polluted because of haze in the air.

Another example of conflict centered on her thoughts of selfishness. She was in her room doing homework. She was thinking about her own selfishness and figuring out why she was sad. She was correlating selfishness with being sad and how there was no logical reason for her to be depressed. She was not feeling sad at the moment, rather she was involved in this thought process. Thinking about selfishness continued on into her next beep where she was in her room sitting down looking at her nails. She wasn't focused on her nails; instead she was focused on her thought process about selfishness. She was trying to justify her selfishness by balancing it out by doing something else. She was thinking about bringing a child into the world at the moment of the beep and that that would make her selfless. The selfless realization came after the beep.

Sheila's daily life contained a variety of negative feelings. More specifically, throughout sampling she experienced bitterness/disappointment, selfishness, depression, and annoyance on multiple occasions. For example, at one moment she was watching the show *Flavor of Love*. She was really stressed out and she thought this was because of her biology major. She was watching the character Flavor Flav on TV and comparing herself to him. She knew that she was never going to have as much money as this guy who has no talent. She was saying in her head "I'm mad at Flavor Flav." She was feeling bitterness and cynicism in her body. She felt depressed and there was a sensation of a little heat in her body.

Another example of a negative feeling moment occurred when she was at work, sitting down at her computer typing. A coworker was talking to her, but she really didn't want to talk to him. He was telling her about his body mass index score. He was saying, "I dropped down to 172." He was saying this in an excited tone. She was feeling impatient/annoyed and just wanted him to stop talking and was thinking about how much she didn't want to hear him anymore. She was looking at him and noticing his skin tone around his mouth. She was noticing the unevenness of his skin.

In contrast, she had positive feelings only three times. She felt a mild sense of happiness when she contemplated quitting school, which was described in the first paragraph. She also experienced a feeling of excitement on two occasions. During this depressed period of her life she experienced more feelings of depression (33%) than of happiness (13%).

During Sheila's first day of sampling she experienced depressive content or irritation in all six of her sampled moments. These included thoughts of why she was sad, how to

reduce selfishness, bitterness about a TV star, thoughts of her friend's suicide, annoyance with her brother, and disappointment with her grades. The first three beeps have been described in previous paragraphs. The moment that included an image of her friend's suicide occurred when she was in her room getting ready for bed and was about to start reading a book. She was thinking about her friend's suicide. She was having an image of what happened when her friend did it. The scene was mainly in black and white. She saw the scene from about 40 feet away or at the entrance of the friend's room. She saw her friend in her walk-in closet. There was a belt attached to a wooden post and she saw her friend hanging there. She was wearing a black shirt and her hair looked stringy. Her friend's head was angled to the side with her hair covering her face. There were no clothes hanging up, but some shirts on the floor of the closet. She could see part of her friend's bed that had a bright blue comforter. She saw this scene from first-person perspective.

She appeared distraught by the end of the first interview. During subsequent interviews she claimed that she tried to engage in activities when she was collecting the beeps (e.g., working on homework, talking on the phone, and working at her job). Only 6 of the remaining 18 moments contained irritation or depressive content. An example of a moment where she was engaged in an activity without irritation or depression was when she was in her room and had her homework out. She was thinking about what she was going to wear for the next day. She was having a mental image of seeing a brown shirt and jeans out in front of her. The clothes were in a closet sort of floating. She was also debating about a wearing a skirt that was experienced in the back of her head at a low level. The change from having frequent depressive content in her experience during the

first sampling day to having much less when she tried to engage in more activities led Sheila to conclude that by distracting herself she decreased the amount of depressive thoughts in her experience.

During many moments Sheila seemed to be experiencing anxiety. Sixty-seven percent of her moments contained some form of anxiety. For example, she was at work and was working on grouping papers. She was looking at the numbers 4-5-2. She saw these numbers in black with a white background. She was feeling worried, because a friend had told her that he wanted to tell her something, but that they would talk about it later. She was experiencing this worry in her chest and stomach; her chest felt tight and her stomach felt heavy. In another example, she was working on a physics problem. She was thinking about the formula 2Π/W. She was thinking of what numbers to plug in. She was feeling frustrated in her head with a sense of motivation to not give up. She could also feel a headache that was experienced in the back of her head. It was experienced from the bottom of the back of the head to the neck and the temples. It felt light, consistent, and painful.

Overall, Sheila's experience was filled with frequent images or unsymbolized thoughts. Often, she was engaged in an internal debate that might be considered mixed feelings or an internal struggle. Most of her moments were negative and they frequently contained thoughts or feelings that of depressive or anxious content.

Depressed Participant #3: Sterling

Sterling is a 19-year-old Hispanic male undergraduate student. He reported that he was doing fine in school and lived with his family. He also worked at his family-owned restaurant. He reported that he began feeling depressed after his ex-girlfriend broke up

with him. He stated that he has experienced depressive episodes since he was in grade school, typically at the end of the school semester. He claims that his mom is often critical of his grades and reacts by refusing to talk with him.

Sterling's inner experience appeared to be characterized by frequent mental images (83%) and feelings (78%). Sterling's mental images often involved him, his family, or his friends. An example of a mental image moment occurred when he was trying to establish a wireless connection to his computer but couldn't make it work. He felt angry. He felt a mini heat burst in his forehead area. He was experiencing a mental image of himself in a black scene with a spotlight on him from the front view. He was wearing black trousers and a burgundy polo shirt. He saw his lips moving and hearing himself say "why are you so retarded, why did you buy the cheap computer." He was seeing the scene as if he was moving around it in 360 degrees.

In another moment he had a mental image of his dad; he was thinking about what to give his dad for his birthday. He saw an image from the 1st person point of view of his dad receiving the gift. He saw his dad in the center of the image at a table. To the left and right of the dad were lots of family members. His dad had his hand stretched out receiving and opening the gift but the vision ended before he could see the gift. He recalled seeing his uncle on his dad's right, his mom and grandma on the dad's left, but everyone else was faded. There was a black background and shades of blue, gray, and green in the scene. However, his grandma was wearing orange. He also felt excitement in his upper body that was experienced as blood rushing through his veins.

An example of a mental image of his friends occurred when he was walking out of class. He had just seen his friend's face, which looked sad. Sterling felt sad and down,

which he experienced as feeling more flexible and having less muscle tension. He visualized a scene of his friend standing up with his head looking down at his shoes and then he saw himself look down as a result. He blamed himself for his friend's sadness. Sterling felt it was his fault for his friend not doing well and that he should have called him to have him come over and study for the exam. Almost 90% of his mental images involved images of himself, his friends or family members.

With regard to feeling moments, he experienced negative feelings (e.g. depression, stress, anger, worthlessness, jealous) more often than positive feelings (e.g. happy, excited) at an almost 2 to 1 ratio (11:6). For instance in one beep his ex-girlfriend was talking to him on the phone and she told him that she wanted to sing happy birthday to his dad. He thought she wanted to steal his dad from him. He felt jealousy throughout his body, which he experienced as a numbing sensation. He visualized an image of a competition between his ex-girlfriend and him for his dad. In this image he was in an auditorium and seeing his dad to his left and his ex-girlfriend on stage. She had a microphone and was singing. She was seen from her knees up, wearing faded jeans and a white sweater with UNLV in red letters. He had bought the sweater for her previously. His dad was sitting down looking at her with a disinterested facial expression and slouching posture that made it seem like he wasn't interested in her singing. The background had purple curtains with dim lights.

In another moment he was going to the library to renew his FAFSA financial aid form. He was in his car, listening to music. He felt a lot of stress with a heat burst like a mini solar flare throughout his body. He could also feel his palms sweating. He was hoping that one of the computers was open so he could fill out the FAFSA form. He

visualized the eight library computers from about 12 feet away. The computers were being used on the left side of the computer room. On the right was one computer not being used. The monitor of the unused computer was blank. All the other computers had websites on them.

With regard to positive feeling moments, he had one moment where he was at a table inside the restaurant with his aunt and dad. He was happy at the moment because he was bonding with his dad. He was having an image of his dad wearing shabby brown old pants with a squared shirt. His dad was holding a baby that he believed was him when he was a baby. He viewed this scene from in front of his dad. The baby was wearing a white outfit and his dad was throwing the baby up in the air and catching him, holding him close to his chest. He could see his first house in the background.

Emotional themes were also apparent in Sterling's inner experience. Themes that appeared in moments for Sterling were those of anxiety and depression. He experienced anxious moments in 57% of his beeps. An example of an anxious moment occurred when he just arrived at work and did not see his mom's car. He was standing outside of his family's restaurant and noticed his aunt's car, not his mom's, which was unusual. He visualized an image of a car accident in which his mom's car had been hit by a semi-truck. He could see the front of the truck at a side angle. It was slightly damaged. As he walked around the corner he saw his mom's Ford Explorer. The tires were missing, the windows were shattered, and the hood and rear door were missing. He could see a lot of vivid blood on the driver seat and stereo. There were two drops of blood on two teddy bears on the dashboard. The scene was in black and white. He felt sadness that was experienced as weakness in his body. In another example, he was stepping into his car,

he had an image of sitting at his desk looking down at the black tabletop with his test on it. He could see that there was a red score on it, but he could not read the score. He was worried about receiving his test grade back. He wondered if he had studied enough and if he had reviewed everything sufficiently. He was feeling stressed. He also noticed that the hair on his arm was standing up.

With regard to depression, 39% of his beeps contained depressive experiences. For example, while walking to his car, his friend was telling him a story about how one of his friends had become pregnant. Sterling visualized a wedding scene in which a friend that he used to have a crush on was in a wedding dress marrying another guy. He wanted it to be himself getting married instead of the other guy. He saw that guy as the cartoon character Goofy because that was the guy's nickname. The girl was on the left and "Goofy" was on the right. He could also see himself in the scene on the left behind the couple. The scene took place on a grassy field that had a palm tree. It was a sunny day. He experienced the image as if someone else was watching the scene of him and the couple from ten feet away. He felt a little depressed, which he experienced as a loss of energy throughout his body. He also felt his heart slowing down.

In another example, Sterling was parking his car at Marie Calendar's restaurant. He was just getting out of his car. He was thinking about whether he had enough money for his dad's birthday gift and to pay for the cleaners. He had an image of a restaurant scene of himself and a cashier. He was opening his wallet and it was empty. He was seeing a dark skinned cashier with hazel eyes, baby blue shirt, and a white apron. The man was giving him a pink box with the box partly open. He could see a white frosting cake with the words happy birthday. He saw this scene from the first-person perspective. There

was black background. He felt like he was shrinking in size after he saw nothing in his wallet. He felt worthless throughout his whole body.

Two themes that appeared associated with the emotional themes were thoughts of school and the future. Fifty-two percent of his moments were about school and most of these were related to anxiety. For example, at one moment Sterling was at work thinking about the psychology quiz he was going to have that day. He was seeing an image of himself sitting at a gray desk with a sheet of papers tacked to his left and one sheet in front of him. He saw grape juice on his right side and he could barely make out a piece of bread on a napkin in front of him. He saw his back with a white shirt and boxers. The background had a window with brown shutters and shades of blue on the wall. He was wondering how he was going to do on the quiz, if he had time to study, and if he had studied enough.

An example of a moment involving the future occurred when he was taking a test and was in the middle of answering a question that he was confident about. He felt good, happy, and joyful all over his body. He also could see himself in a room with his parents. They were all talking but with no sound. He saw this scene from behind himself and looking at his parents. He could see everybody from the waist up. He was only a few feet away. His mom was on the left, TV in the background, no boundaries in the scene, and his parents were smiling. He could see his mom's lips moving and he could lip-read her saying "studying paid off." He thought he was showing his parents he was doing well and that they were happy.

Overall, Sterling's experience was filled with frequent mental images and feelings. Most of his moments involved thoughts and feelings related to family, friends, himself,

and school. Most of Sterling's feelings were negative and they frequently included the experience of depression or anxiety.

Depressed Participant #4: Matt

Matt was a 19-year-old Caucasian male. He was in Psychology 101 to satisfy degree requirements. He reported that he was doing fine in school and lived with his family. He was in the midst of a depressive episode and claimed to have been battling depression throughout his life.

Matt's inner experience took on a variety of forms such as feelings (96%), sensory awareness (67%), and unsymbolized thinking (29%). He experienced an unusually high number of feeling moments. Matt had more negative feelings (e.g., anxiety, anger, dread, sad) than positive feelings (e.g., happy, relief, satisfied, anticipation) at a rate of 18 to 5. An example of a negative feeling moment occurred when he was in his kitchen reading a birthday card from his dad's girlfriend. He was focused on the number 18 that was pretty big on the card. The numbers were in black with white background. He was feeling really angry throughout his body. His body felt really tense and his hands were clenched. He was wondering how they could forget how old he was and why they gave him a card a week late. He was also feeling a low level of sadness that they had forgotten his age and date of his birthday. He also was feeling anticipation in his stomach that was experienced as butterflies in response to waiting for his friend.

He did experience positive feeling moments, but they did not seem to last for extended periods. For example he experienced a positive feeling moment standing by his table discussing the birthday card (previous example) with his friend. He was joking about how they should get drunk before the party. He was saying out loud to his friend

"down all the beers" in a slightly elevated, joking voice. He was feeling happy which was experienced as lightness in his body. Linked to the happy feeling was thinking he was relieved that his anger had turned into something else. He was also looking at his friend who was laughing and noticing his friend's eyes.

A little while later he was experiencing the birthday card again in his awareness but there was a negative feeling present at this moment: he was grabbing his keys to get ready to leave his house with his friend. He was feeling worried/overwhelmed, which was associated with a nauseous sensation in his stomach. He was worried that he wasn't going to make it to his appointment on time and that he had a lot of other things he had to do. He was thinking about his birthday card that he had received earlier and that he had to go to a barbeque for him and his brother. In addition, he did not want to go to the barbeque because his parents couldn't remember his age; therefore he thought he shouldn't go. This thought was experienced in the back of his head.

Negative feeling moments were often followed by other negative feeling moments for Matt. For example, at one moment he was watching TV in a chair in his friend's dorm room. He was watching CNN and the newscasters were talking about profiling the Virginia Tech shooter. At the same time he was seeing the shooter talking to the camera. He saw the shooter's head and shoulders, but was mainly focused on the shooter's eyes. He was feeling anger which was experienced as heat in his face. He was wondering why they were profiling the shooter when they should be talking about the victims, that he didn't understand the shooter, and this was what the shooter wanted – exposure. Then he had another negative feeling moment when he was getting his stuff together to leave his friend's dorm room. He was looking for his wallet prior to the beep. He was saying out

loud "how the hell did it get here?" in an inquisitive /suspicious voice. He was feeling dread because he was leaving and he didn't want to go home. He was feeling in his whole stomach a slight sensation of butterflies related to the dreadful feeling.

Matt seemed to evidence many symptoms of anxiety and depression in his moments. Matt experienced anxiety in 38% of his moments. An example of an anxious moment occurred when he was on his computer, typing a comment to his friend. He was experiencing a feeling of anxiety. He felt tightness and tension in his shoulders and neck. In the back of his head he was wondering if she was going to find his comment funny, that he was trying to make it funny, and he wanted his comment to be better than the one she had left him earlier. He was also aware of typing the word "drink," in the sentence "I needed to get my drink on." This was in reference to going drinking at a party. Another anxious moment was when he was typing a paper. He was typing the word "astronomy." He saw the word in black, with white background, while everything else on the screen was blurry. He was feeling worried/nervous, which was experienced as tension in his neck/shoulders and butterflies throughout his whole stomach. He was worried about getting his paper done. He separately was thinking about when would his friend text message him back.

With regard to depression, 33% of his moments involved depressive content. For example, he had multiple moments where he dreaded being alone or going home. In one, he was in his car and had just stopped at a stoplight. He was seeing a plane take off that was orange and blue. He was focused on the right wing of the plane and the red and white lights were blinking. He saw the streetlights, Mandalay Bay, and MGM Grand in the background. He was having a feeling of dread that was linked to not wanting to go

home and he also noticed butterflies in his stomach. He was also having a feeling of longing. Tied to this feeling was the thought of wondering where the plane was going, wanting to be on the plane, and wanting to go somewhere else.

Matt experienced sensations in his stomach or shoulders in a high percentage of his moments. Forty-six percent of his moments involved noticing something with his stomach. Most of the time he experienced the sensation of butterflies but sometimes it involved "going down a roller coaster." For example he was downstairs eating dinner. He was noticing food in his mouth, which tasted good, and was enjoying it. He was feeling worried which was experienced as tension in his neck and shoulders. This feeling of worry also was linked to a loss of appetite in his stomach. He knew that he couldn't eat all of his food, that his stomach was sick, empty but full, and felt like he was going down a roller coaster. Before that moment he had text messaged a friend. At the moment of the beep, he was wondering when he would receive a reply text message from his friend.

Twenty-one percent of his moments involved tenseness in his shoulders. Usually the tenseness was associated with anxiety. For example he was typing his paper. While looking at the computer screen he saw bright white on the screen. He was experiencing his eyes being heavy and dry, like they were tired. He was also feeling worried and stressed, which was experienced as coldness throughout his body. Tied to this feeling was a wanting to get the paper done and wondering if he would get it done. He was also feeling tension in his neck and shoulders and anxiety that was experienced as butterflies in his whole stomach.

With regard to thinking, he had a moment where he had just gotten out of his shower. Two of his friends had left and one of his friends was supposed to come back. He was looking down his spiral staircase in anticipation of seeing one of his friends come back. He was seeing the marble floor, but was focused primarily on its vivid sky blue color. He was having feelings of urgency and frustration that was experienced as a strong tenseness in his shoulders and neck. Part of the feeling was wondering where his friend was and thinking that he had to leave and she wasn't there. Another example of thinking occurred when he was on the computer in his friend's dorm room. He was reading one of his friend's blogs. He saw the word "alone" clearly in black letters with a white background. He could see words to the side and lines above and below "alone" but they were faded. He was feeling confused. He was thinking that he had never seen that side of his friend, that he didn't expect him to write this, that he didn't know him like he thought he did, and that he had never talked with his friend about the things he had revealed in his blog. His friend had written about feeling alone and depressed.

Overall, Matt's experience was filled with frequent feelings, sensory awareness, and unsymbolized thinking. He experienced an unusually high number of feelings in his moments with negative feelings appearing more often than positive feelings. In addition, his positive feelings did not appear to be sustained for long periods of time. Potentially problematic for him is that he experienced a lot of anxiety and depressive content in his moments. Of note is that his stomach and shoulders were experienced in an unusually high number of his moments.

Depressed Participant #5: Charles

Charles is a 51-year-old Caucasian male. He had experienced depressive episodes and alcohol abuse over the years. Currently he has been sober for a number of years but he continues to experience symptoms of depression. He is taking antidepressant medication and seeing a counselor to help him cope with his depression. He was a dentist several years ago but lost his license due to excessive drinking. He was in the process of completing courses in order to work as either a marine biologist or a nurse. He reports doing well in school, but was stressed and depressed during the exam process. He was living by himself when he participated in the study.

Charles's inner experience included frequent thoughts or memories of his past. Forty-eight percent of the moments were about his past experiences. The contents of these moments of experience were either tragic or pleasurable. For example, a tragic moment involved emailing a friend about his alcoholic past. He was feeling remorse and sadness. He described this feeling as a huge sense of despondency. It was accompanied by a nauseous feeling in his stomach. He also had an image of a head-on car crash viewed from the side from about 50 feet away. In his image the cars were just coming into contact; this image was a reconstruction of a crash he was involved in years ago while he was driving drunk. He doesn't remember the details of the crash because he was drunk, but this was the image he had recreated of what he thought it was like. The cars in his image were generic and lacked details such as color.

An example of a moment of experience that was related to a pleasurable experience from his past occurred when he was talking to his friend from Colorado on the phone. They were discussing Colorado University and what they had called "Friday Afternoon

Club." At the moment of the beep he was listening to what his friend was saying about Friday Afternoon Club and reminiscing about a girl he was dating at that time. He was experiencing an image of six people sitting around a table by the window at the Sink restaurant. He saw himself, his girl sitting to his left, and a guy sitting across from him as if from about 15-20 feet away at a slight slant.

Of interest was the intensity of some of Charles's moments of experience. He experienced them as if he were reliving the actual event with enthralling detail and vividness. For example, in one moment while he was returning an email to his friend he was reflecting on a past event involving skiing. He was experiencing a mental image of himself racing down a ski slope with his friend. He saw this from the first-person perspective. He was moving and could see his black skis, moguls about 30 feet ahead, and trees off to each side. He did not see any other people. He experienced the idea that he was going to beat his friend. He also was experiencing exhilaration similar to what he had felt during the actual skiing; this felt like an adrenaline rush and lightness through his body.

Charles tended to experience the world in images (74%) and feelings (35%). More than half of his images contained moments about his past, while half of those moments were reflections of depressive incidents. For instance, in one moment he was riding his bike against oncoming traffic. Prior to the beep going off, he was almost in an accident. When the beep went off he was aware of his heart pounding and the experience of an "adrenalin rush" as a result. He was also experiencing a visual image of a time in which he did get into a bike accident in circumstances similar to his recent near miss. He saw

this image from his own perspective. In the image he was falling to the ground; visually this seemed as if the pavement was racing up at him.

Of his feelings moments, more than half of them centered on sadness or anger. For instance, he was riding his bike back home from the store after he had bought a pint of ice cream. He had an image of himself being overweight. More specifically, he was visualizing only his midsection of his stomach from a front view with shirt off from the top of his swim trunks to the top of his stomach as if seen from about 10 feet in front of him. In the image his stomach was sticking out about six inches more than actual stomach size. He had a sense that the image represented him being overweight; he also had a sense that the image was of him in Cancun, though there were no other details in the picture. In addition, he was feeling angry and despondent about buying the ice cream when he is trying to watch his weight.

It is apparent that Charles had numerous moments of depressive symptomatology reflected in his inner experience. Some of these moments included thoughts about being overweight, alcoholism, accidents, the meaning of depression, and confrontations. Another example of a depressive moment of experience occurred while Charles was riding his bike uphill. Before the beep he had been thinking about the John Denver song "Annie." He believed this song often depressed him. At the moment of the beep he had a visual image of riding up a chair lift in Aspen, Colorado. He saw straight ahead with Bell Mountain to his left, a ski run straight ahead, and trees off to each side. The weather was clear and he was half way up the ski lift. The scene had appropriate colors but did not have people in it. He also was experiencing a feeling of melancholy that he described as a longing. It was as accompanied by a physical sensation in his gut. Charles endorsed the

idea that whenever he listens to John Denver's music he becomes depressed because he connects with the lyrics.

Overall, Charles's experience is filled with frequent images and feelings. Most of his thoughts or memories were of his past. Most of his feelings were negative and they frequently included the experience of depression.

Depressed Participant #6: Brooke

Brooke is a 19-year-old Hispanic female. She was completing Psychology 101 as part of her degree requirements. She reported that she was doing well in school and lived with her family. She was in the midst of a depressive episode that coincided with her boyfriend being arrested and jailed. She claimed to be struggling significantly with the situation, having lost 15-20 pounds in two weeks. Overall, she was unusually cheerful during the interview process for the symptoms that she endorsed. It was learned after the interviews that she had dropped one of her classes. Brooke claimed to have never been depressed prior to the situation with her boyfriend.

Brooke experienced life for the most part in feelings (79%) and sensations (46%). The majority of her feeling moments were positive (e.g., happy, giddy, excited, silly) rather than negative (e.g., upset, irritated, nervous, cranky) at an almost 2 to 1 ratio (11:6). For example she experienced positive feelings when she was at her work and she had just finished talking with some friends. She was feeling very excited and happy. She was just told by her boss that she was going to do a modeling shoot for her company. She was thinking that she couldn't wait for the next week to come so she could do the shoot. She noticed a smirked expression around her whole mouth that was experienced as tightness. Another example of a positive feeling moment occurred when she was

buying concert tickets online at home for her sister and her sister's boyfriend for a graduation present. She was feeling happy and excited in her entire body. She was thinking that she hoped that her sister would be excited, that she'd better be excited, that she was getting her sister a graduation present, and that although she is paying for it, she should not have. An example of a negative feeling moment was when she was in her bed, trying to go to sleep. She was listening to music. She was hearing the words "my girls in the next room." She was feeling upset and this was experienced in a part of her heart. She was also saying to herself "I can relate to that."

Of note was the fact that she experienced five moments (21%) in which there was a feeling that had both positive and negative aspects, such as: sad/happiness, happy/missing, cranky/tired/laughing, giddy/antsy and excited/nervous. An example of a moment where this happened was when she went to the gym to work out. She was in the middle of doing a back exercise when the beep went off. She was feeling a sad kind of happiness throughout her whole body. At this moment she was thinking about missing home which was associated with seeing a mental image of a track meet. She saw her and her three friends talking. The friends were two girls and a guy. They were in front of a yellow touchdown post. There was green grass and the background contained a shed, triple jump pit, and high jump. They were trying to antagonize their coach. Everybody was having a good time and she could see everybody's whole body.

Another example of a mixed feeling occurred when she was chatting online with her friend. She was reading his message about the mission that he was going on. She was focused on the word "mission" on the screen. She was experiencing the feeling of happiness and missing him in her heart. She could hear his voice in her head saying

"going on a mission." He was saying it in a frustrated voice. She was thinking, What can I do to make him feel better? He is my best friend; and that she needed to be careful about what she said to him.

Besides having feelings in a lot of moments, 46% of her moments had sensory awareness. An example of a sensory awareness moment was when she was sitting on the counter at work. She was feeling tired/exhausted/cranky/fussy throughout her body. She noticed that her feet hurt as there was a painful, burning sensation consuming both. Another example of sensory awareness occurred in a moment when she was cleaning her room at home. She was listening to music and dancing at the same time. She was listening and hearing the beat of the music at a fast tempo, which was the focus of her awareness. She was dancing and was in the middle of doing a cheerleader clap. She could feel the music throughout her body and her muscles. She was making sharp moves and counting the beats to each move. She was feeling really good and relaxed throughout her body.

During many moments Brooke seemed to be experiencing anxiety. Sixty-seven percent of her moments contained some form of anxiety, such as discussing new protocols at work, going shopping with a friend, and reviewing notes for an exam. Examples of these moments are as follows: she was at her work and talking with her boss. She was feeling irritated and tense throughout her body. It was experienced as a sharp pain spiraling down from her neck through her spine. She was thinking that she wanted to throw something or hit someone. In addition, she was thinking that it was dumb of the owner to institute "check ups" on the workers. The second example involved her talking with a coworker at work. They were talking about going shopping.

Brooke was feeling gitty and antsy throughout her whole body. She described it as just wanting to go shopping, that she couldn't sit still, and she felt like a little kid. She was thinking that this is the first time she was shopping with a friend that was not a guy, her sister, or cousin. She was also wondering how much money she could spend. A third example of anxiety was when she was reviewing psychology notes at home in her room. She had an exam in psychology in two hours and she was feeling nervous about it. She was experiencing knots and butterflies in the middle of her stomach. It was experienced as a strong pain and the pain seemed like it was floating while also having numerous contractions. In her notes, she was reading about the superego, ego, id, and people's attitudes and behaviors. The words were in pink letters with a white background. She was trying to relate her notes to something in her life and she was saying in her head "which one of my friends is like this?"

Of note was a couple of moments where she was feeling relaxed, potentially indicating that because she worries a lot, it is very recognizable to her when she is relaxed. For example, at one moment she was driving her car and listening to music. She was paying attention to the beat. She was hearing a fast tempo and listening to the drums. The music was really loud. She was feeling good. She was in a good mood and had nothing to worry about. She felt relaxed in her whole body. Her body felt light and as though it was going with the flow of the music.

Overall, Brooke's experience was filled with frequent feelings and sensations. With regard to feelings, she experienced more positive feeling moments than negative feeling moments. She sometimes had atypical experiences of feelings that were mixtures of

positive and negative emotions. Potentially problematic is that she experiences a high number of moments of anxiety.

Control Participant #1: Aaron

Aaron was an 18-year-old Caucasian male. He reported no history of psychological problems nor was he experiencing any symptoms of depression. He was in the process of completing his first year of college and reported that he was not doing as well as he would have liked in school. He lived at home with his family.

Aaron's inner experience predominantly contained thoughts or feelings focused on his girlfriend. For seventy-five percent (18 of 24) of his moments the primary focus or content was his girlfriend. These moments mainly took the form of missing her or recognizing how much she means to him. For instance in one beep he was in the middle of text messaging his girlfriend. He had a thought about really missing her and was experiencing the feeling of missing her. More specifically, he was missing her more than usual, as if he were never going to see her again. In another moment he was on his couch and text messaging his girlfriend. He was having an overwhelming feeling that he was truly in love with her. He had a thought of being happier than he has ever been, that she meant a lot to him, and that he loved her. He also had a feeling of weight lifting off his shoulders. This weight lifting off him made him feel better.

Aaron's inner experience took on a variety of forms such as feelings, images, and unsymbolized thoughts. He experienced feelings in 58% of his moments and, of these, 85% were centered on his girlfriend. The feelings associated with his girlfriend were mainly happiness (75%) and missing her (17%). For example, at one beep he was at his girlfriend's and he had just kissed her. He was having a physical sensation of

blissfulness, perfection, connection, and meaningfulness throughout his entire body. An example of him missing her was when he was text messaging his girlfriend and he was thinking about missing his girlfriend. He had a sense of something missing. He felt he was almost in a peaceful setting, but didn't feel whole, so that is why he felt something was missing. He felt like something was out of place and that time was standing still.

He had five images; four of these were of his girlfriend. Interestingly he experienced bluish tint in two of these four images and both of these were experienced when he was focused only on seeing his girlfriend's face. For example, he was sitting on his couch watching TV. He had a mental image of his girlfriend smiling and saying "I love you." He was hearing her say it in her voice but a little bit quieter than normal volume. The image that he experienced was of her face and her mouth was moving towards a smile. In his image, he saw from the top of her head down to her neck. He saw it from his own perspective and saw her face as a light shade of blue and her hair as brown and blue. The background was black and he experienced this in his head. The bluish tint was the primary color present during both of his image moments.

He experienced unsymbolized thoughts in 33% of his moments. Half of these thoughts were when he was in the process of receiving or sending a text message to his girlfriend. For instance in one beep, he had just received a message from his girlfriend prior to the beep saying "I'm in love with you, because you make me happy. I can depend on you for comfort." When the beep hit, he was in the process of thinking that he knew this was the truth, that she meant every word of it, and he knew that she loved him. He had eight moments where he was receiving or sending a text message to her and four of these eight moments contained unsymbolized thoughts. Lastly, 75% of Aaron's

moments were experienced when he was sitting on his couch. The other 25% of his moments were collected when he was spending time with his girlfriend. The first three days of sampling he was at home by himself, while the last day of sampling, he spent with his girlfriend. Thus the predominance of thoughts about his girlfriend may be due to sampling bias.

Overall, Aaron's experience was filled with frequent feelings and unsymbolized thoughts. Most of his moments involved thoughts and feelings related to his girlfriend. In addition, most of his feeling moments revolved around the state of being happy.

Control Participant #2: Jared

Jared was a 19-year-old Hawaiian male. He had no history of psychological problems nor had he experienced symptoms of depression. He was in his first year of college and reported that he was not doing well. He lived in the dorms with a roommate.

Jared's inner experience took on a variety of forms such as mental images (58%), sensory awareness (54%), and inner speech (33%). An example of a mental image occurred when he was eating pizza at the dining commons. He was imagining a scene in his head in which he was focused on an orange colored grease spot on top of his pizza. It was shiny and glossy and located on the middle of the slice. He imagined seeing his arm from the forearm to his hand about to dab the grease of the pizza. He could see his hand with a folded napkin moving slowly towards the pizza. The pizza was on a pink plate, which was on a brown round table. He could see three or four people who were blurry in the background. The people were blocking a huge black television, which made up the entire background.

His mental images did not have any obvious themes. However, four of his moments had side-by-side images. An example of the side-by-side moment was when he was looking at the website NBA.com. He was looking up Marvin Williams's career stats. He visualized two side-by-side images. The right image was of an Atlanta Hawks jersey from the 1980's Dominique Wilkins era. The jersey was red, with white borders, and yellow words. The image on the left was of a player by the name of Sheldon Williams. Sheldon was wearing a brown polo shirt and sitting in the middle of a crowd at a game. He could see three rows up and two rows down while also seeing about four to five people to the left and right of Sheldon.

In another example of as side-by-side mental image moment occurred when he was about to go to sleep. He was thinking about getting up early and going to the dining commons the next day. He was experiencing side-by side images in his head. On the left side of his head he saw a picture of the dining commons. He could see the pink post and the wall as if you were looking at it from Central Desert Complex building 6. He could see black asphalt and stretching pavement in the background. On the right side of his image he could see the chef from his chest up. He was wearing a white cooking shirt and a black chef hat. He had white curly hair sticking out like a froe underneath the hat on both sides of his head. He was described as having a pink face, old looking, and disgruntled facial expression. The images were right next to each other.

He experienced sensory awareness 54% of the time. Throughout his beeps he experienced at least one moment with every sense of the body. For example he experienced the sense of touch when he was drinking hot chocolate at his dorm room. He was holding the cup in his hands. He was focused on the hotness of the cup on his left

fingertips and palm. It felt warm in his hand. He could also see the color of the chocolate and noticing the light brownness of it. He was saying to himself "is it too watery," in his voice in his head.

He experienced the sense of sight in when he was watching the 3-6 music video. He was focused on one of the singer's teeth. He saw dark silver grills that were spaced apart. He was focused on the top row of teeth and upper lip. He noticed that his teeth are spaced apart more than usual.

He experienced the sense of hearing when he was on his computer playing the game "minesweeper." He was hearing the click, click, click sound of clicking the mouse. He knew he was clicking the mouse. He noticed his hands were sweating. The experience was clamminess and was felt on the top of the mouse as well as the right three most fingers and the right side of his palm.

He experienced the sense of taste when he was eating a Subway sandwich in his room. He was looking at the peppers in his sandwich and was noticing the yellowness of the peppers. He describes the pepper's yellow color to be similar to that of light colored urine. At the moment of the beep he could also taste in his mouth a hot mild sensation from eating the peppers. The sensation was tingly, and was experienced on the right corner of his lips and his tongue.

Finally, he experienced the sense of smell when he was walking to his dorm room. He was passing by people who were smoking cigarettes. He could smell the cigarette smoke in both his nostrils. It was a very strong smell and he recognized it as menthols. He said to himself, "gross." He was also seeing an image of a cloud of smoke in his head. It was a large amount of smoke that was gray in color. The middle was darker than the

outside. The background of the image contained grass and a building. The smoke took up most of the image.

Inner speech appeared in 33% of his moments. For instance in one moment he was standing up in his room about to go to class. He said to himself in his head, "I need to take out the trash." He also saw a mental image of a white trash bag that was full and tied up to the right of a black refrigerator. The refrigerator had a grey handle. The background of the scene was a lighter shade of black.

Overall, Jared experienced the world in a variety of forms with the main themes that of mental images, sensory awareness, and inner speech. He sometimes had atypical experiences of mental images that took the form of side-by-side mental images. Furthermore he did not appear to have any particular senses that dominated the majority of his moments. Of note was that there was only one experience of an unsymbolized thought or feeling in his moments.

Control Participant #3: Jessica

Jessica was a 19-year-old Caucasian female. She was taking Psychology 101 to satisfy her degree requirements. She reported that she was doing fine in school and lived with her family. She had experienced a depressive episode when she was 17 as a result of being raped. She reported she was doing well as evidenced by the statement, "I am the happiest I have ever been."

Jessica's inner experience took on a variety of forms such as sensory awareness, inner speech, and unsymbolized thoughts. She experienced sensory awareness in 50% of her moments. For instance in one moment she was in her bathroom, particularly intent on brushing her teeth. She was looking in the mirror and noticing herself brushing her teeth.

She was seeing the toothbrush (mechanical) and watching the toothbrush going across the top and bottom rows of her teeth. She also tasted a strong taste of cinnamon toothpaste on her tongue.

Seventy-five percent of her sensory awareness involved visual stimuli. An example of a moment with visual stimuli was when she was in her room watching the TV show "Law & Order." She was looking at her bracelet and noticing the blueness and whiteness of it. She saw the blue as a light sky blue color and the white as a diamond looking white. She was saying in her head "I need to clean my bracelet."

She experienced inner speech 25% of the time and unsymbolized thoughts appeared in 21% of her moments. An example of an inner speech moment was when she was in her room and sending a text message to her friend. She was thinking about what she was going to send to him. She was saying to herself "Oh no, go to sleep, I'll talk to you later." This was said in her own voice. An instance of an unsymbolized thought appeared when she was lying on the floor of her room organizing her dresser drawer. Prior to the beep, she had just found an ink cartridge for her printer that she didn't know she had. She was trying to remember whether the cartridge would fit her current printer. She was debating between the numbers 92, 93, and 99 as to which one was the one needed for her printer.

Jessica's experience was simple in the sense that 38% of her moments had only one experience. For example she was in her room on her computer looking at myspace.com. She was thinking to herself that she needed to check her rebel email account. In another example she was in her room watching the program *CSI* on television. She saw a scene

where a dead girl was lying with her head on the toilet. Jessica focused on the dead girl's hair. It was red, long and straight. She noticed nothing else at that moment.

It also seemed like verbal speech was dominant in her awareness. This was evidenced by talking (17%) or inner speech (25%) in 42% of her moments. An example of a talking moment, she told her friend on the phone "Scott was an asshole tonight at work." There was nothing else in her awareness at the moment of the beep. An example of inner speech in a moment occurred when she was watching a movie in her bedroom. She was feeling exhausted which was experienced as a feathery lightness in her body and a recognition that her eyes were getting heavy. This was felt throughout her eyelids. She said to herself in her head, "I need a Starbucks."

The context of most of Jessica's moments was her presence in her bedroom. The activities primarily involved were watching TV, doing schoolwork, and using her phone or computer. However, these last two statements may be due to sampling bias.

Overall, Jessica experienced the world in a variety of forms with the main themes being sensory awareness, inner speech, and unsymbolized thoughts. Verbal speech appeared to be a theme in Jessica's experience as well.

Control Participant #4: Trent

Trent was an 18-year-old Caucasian male. He had no history of psychological problems nor was he experiencing symptoms of depression. Trent was in his first year of college and reported that he was doing very well in school. He lives at home with his family.

Trent's inner experience appeared to be characterized by the use of words. Eighty-seven percent of his moments contained experiences of talking to himself, talking out

loud, reading, hearing words in his head, or listening to someone talk. Trent's most salient experience was the expression of language in his head as 47% of his moments contained either talking or hearing words in his head. For example, he was sitting out at the pool with his mom. He was saying to himself, "What could be wrong with the [Jacuzzi] jet?" He experienced this mental speaking as being in his head.

It appears that Trent had an active social life. He was talking or listening to someone during 38% of his moments. For instance, in three consecutive beeps he was talking or listening to someone: He was talking to a friend and he was looking at an exhaust for his car. He was saying to his friend "Do they make Corsa exhaust for the 350Z?" Following that beep, he was walking to a class and listening to his friend talk about an upcoming fight on the weekend. His friend was saying, "I got a fight this weekend." The third beep involved him listening to his sociology teacher. He was focused on looking at him. The teacher was walking back and forth, pacing. He was listening to his professor say "...in a culture of that sort..."

Trent's inner experiences often revolved around motor vehicles, school, and women. Twenty-six percent of his moments revolved around thoughts or discussion involving parts for his car, potential car purchases, and research about cars. For example, he was sitting at his kitchen counter and thinking about buying a chopper motorcycle. More specifically, he was looking at his computer and debating between a Harley motorcycle and Big Dog Chopper motorcycle. At the moment of the beep, he was thinking about whether his parents will let him get it. He was saying in his own voice in his head "Are they going to say yes?" In addition, 17% of his moments were about school and 13% of the moments were about women. An example of a school related moment was that he

was in the middle of writing a cover page in his room. He had just written, "I chose this topic because...." He was rereading this to himself in a louder voice than normal in his head. He was saying, "I chose this topic because." He saw black letter with a white background.

An example of a moment about the opposite sex occurred as he was lying in bed watching a movie. He was thinking about the possibility of sex with a forty-year-old woman. He was hearing in the back of his head in a whisper in his own voice, "For forty years old, she's still sexy. I wonder what that's like?" These three categories were in his experience over the course of three sampling days (1, 2, & 4). However, on the third sampling day, Trent said he was just relaxing. Interestingly, none of these three categories appeared in any of his moments that day. What appeared the most were a lot of sensation-focused moments. For example, during one beep he was trying to fix the filter in the pool. He was turning the filter handle. He could feel the lettering on the filter handle in the palm of his hands. He could feel a slight pressure on his hands with skin being pressed inward. Trent experienced sensory awareness on five of six moments that day compared to only 4 of 17 moments over the other three days.

Overall, Trent's experience contained the frequent expression of language. This mainly took the forms of talking to himself, talking out loud, reading, hearing words in his head, or listening to someone talk. Often Trent's experiences revolved around motor vehicles, school, and women.

Group-Level Characteristics of Experience

Table 2 presents the percentage of sampled moments that contained each of the five most common phenomena of inner experience (inner speech, inner seeing, unsymbolized thought, feeling, and sensory awareness) for each participant as well as the mean and standard deviation percentages for the depressed and nondepressed groups.

Table 2: Frequency of Five Phenomena of Inner Experience

Participant	Inner Speech	Inner Seeing	Unsymbolized Thinking	Feeling	Sensory Awareness
Depressed					
Derek	.13	.00	.21	.46	.63
Sheila	.08	.38	.33	.67	.00
Sterling	.04	.83	.13	.78	.26
Matt	.08	.00	.29	.96	.67
Charles	.04	.57	.17	.35	.04
Brooke	.13	.04	.25	.83	.46
Mean	.08	.28	.23	.67	.34
SD	.04	.35	.07	.23	.29
Nondepressed					
Aaron	.04	.21	.33	.58	.08
Jared	.33	.67	.04	.04	.50
Jessica	.25	.04	.21	.04	.50
Trent	.35	.09	.04	.09	.35
Mean	.24	.25	.15	.18	.35
SD	.14	.29	.14	.26	.20

As can be seen in this table, there was substantial individual variability in the relative frequency of inner seeing, feelings, and sensory awareness. There was less variability in inner speech and unsymbolized thinking. There were two categories of experience for which there were notable group differences. The depressed group had substantially less frequent inner speech than did the control group. This difference was significant, t (8) = -2.66, $p < .05$, $d = 2.7$. Additionally, depressed participants experienced feelings much more frequently than did nondepressed participants. This difference was also significant, t (8) = 3.1, $p < .05$, $d = 2.0$. The other frequent phenomena of inner experience appeared with similar frequencies across groups.

Looking beyond the five most frequent phenomena of inner experience, an informal examination of the nature of the sampled moments of experience revealed that 20% of the depressed group's moments of experience contained explicitly depressive content whereas this was true for only 3% of the control group's samples. An even larger discrepancy was found in the number of experiences that contained anxiety content. Using a similarly informal survey of the moments of experience, 32% of all depressed participant's sampled moments contained manifest anxiety compared to only 3% of the control participants' sampled moments.

As discussed earlier, feelings were more often experienced within the depressed participants' sampled moments than the control participants' sampled moments. Upon further examination the depressed group evidenced a higher rate of moments where negative feelings were present compared to moments where positive feelings were

present at a rate of about 5 to 3. This same ratio was not evidenced in the control participant's sampled moments in which the ratio appeared to be about 1 to 1.

Individual raters rated each moment for their overall positivity, negativity, or neutrality on a Likert scale. Moments were then classified as positive if the average rating of the moment was considered slightly to extremely positive; negative if the average rating of the moment was considered slightly to extremely negative; and neutral if the average ratings did not reach slightly positive or slightly negative. With regard to the overall positivity, negativity, or neutrality of each individual moment, the depressed group evidenced substantially more moments that had a negative or positive tone than did the control group. More specifically 57% of depressed participant's sampled moments had a negative or positive tone, while only 26% of the control participant's sampled moments had a negative or positive tone. Within each group's sampled moments, the depressed group experienced more moments with a negative tone than a positive tone at a rate of 5 to 3, while the control group experience a similar amount of negative and positive moments at a rate of 1 to 1.

Comparisons between the depressed and control participants' experiences using the five rated constructs were also done via a series of independent samples *t* tests. The results of these tests are shown in Table 3. The *t* test for ratings of depression was significant and showed a very large effect size. The other *t* tests were not significant, but all showed a large effect size in the expected direction.

Table 3: Comparison of Control and Depressed Subjects on the Five Rated Experience Constructs

Construct	Control Group Mean (SD)	Depressed Group Mean (SD)	*t*	*d*
Depression	.38 (.21)	1.03 (.38)	3.06*	-2.17
Cognitive Triad	.42 (.12)	.84 (.47)	-1.70	-1.20
Dysfunctional Attitudes	.29 (.17)	.76 (.61)	-1.5	-1.05
Automatic Thoughts	.31 (.13)	.82 (.45)	-2.16	-1.53
Valence	.12 (.75)	-.56 (1.04)	1.11	.79
Overall Rated Depression	-.62 (.18)	.47(1.00)	-2.10	-1.49

Control n = 4; Depressed n = 6; df = 8; * $p < .05$; Depression, Cognitive Triad, Dysfunctional Attitudes, and Automatic Thoughts rated on scale ranging from 0 to 6; Valence rated on scale ranging from –6 to 6

Convergence of Sampling and Questionnaire Data

Finally, I examined the extent to which the ratings of the four constructs for the moments of experience converged with the self-report questionnaires assessing the parallel constructs. To conduct these analyses I averaged each rating construct across all moments of experience for each individual. This resulted in one overall score reflecting the average extent to which each construct was reflected in that participant's moments of experience. I then correlated these scores with the scores on the four self-report questionnaires. These correlations can be seen in Table 4. Three of four convergence correlations, found on the diagonal in Table 4, were significant and the fourth narrowly missed statistical significance. However, all of the other off-diagonal correlations were

also positive and many reached statistical significance as well. In fact, the average of the on-diagonal and off-diagonal correlations was effectively identical at .63. Thus there was little evidence that the convergence was due to variance unique to the individual constructs. Rather it appeared that there was a unitary underlying dimension accounting for the strength of these relationships.

Table 4: Correlations Among Self-Report Questionnaires and Ratings of Moments of Experience.

	Beck Depression Inventory-II	Cognitive Triad Inventory	Dysfunctional Attitudes Scale	Automatic Thoughts Questionnaire
Depression	.64*	.75*	.68*	.62
Cognitive Triad	.50	.66*	.61	.63
Dysfunctional Attitudes	.42	.65*	.57	.59
Automatic Thoughts	.59	.72*	.79*	.65*

* $p < .05$, $df = 8$

To explore the possibility of a unitary underlying dimension further, I examined the intercorrelations of the ratings and questionnaires, shown in Tables 5 and 6, respectively. As can be seen in these two tables, all of the constructs were strongly positively correlated.

Table 5: Correlations Among Five Rated Constructs

	Cognitive Triad	Dysfunctional Attitudes	Automatic Thoughts	Valence
Depression	.83	.75	.84	.72
Cognitive Triad	1	.83	.87	.70
Dysfunctional Attitudes		1	.81	.60
Automatic Thoughts			1	.67

N = 237; All values significant at $p < .001$; Valence is reversed.

Table 6: Correlations Among Depression Questionnaires

Construct	Beck Depression Inventory - II	Cognitive Triad Inventory	Dysfunctional Attitudes Scale	Automatic Thoughts Questionnaire
BDI-II	1	.87	.89	.81
CTI	-	1	.97	.73
DAS	-	-	1	.79

N = 10; All correlations significant at $p < .01$

Finally, given the evidence suggesting that both the rated constructs and the self-report questionnaires may be tapping a unitary underlying dimension, I conducted one final set of exploratory analyses by created a new overall rating variable and a new overall self-report variable. For each variable, the five rated constructs or the four self-report questionnaires were z-transformed and then averaged together. Thus each individual had one overall score for the ratings of the moments of experience and one overall score for the self-report questionnaires. These overall scores were conceptualized as broadly reflecting the construct of depression as seen either through moments of experience or subject self-report. The correlation of these two created variables with each other was again strongly positive (r (8) = .73, $p < .05$). This correlation is somewhat

stronger than the average of all the convergence correlations (.63) shown in Table 4. Thus although there is evidence for convergence of self-report questionnaires and the nature of the momentary experiences, it appeared to be more attributable to a global underlying dimension of depression than to the more narrow constructs delineated in Beck's cognitive theory of depression.

CHAPTER 5

DISCUSSION

The main goal of this study was to examine the experience of depressed and nondepressed individuals, exploring the extent to which the specific constructs identified in Beck's cognitive theory of depression were differentially reflected in the momentary experiences of depressed individuals and looking for any other differences in the momentary experiences. Overall, it was apparent that depressive content occurred more often in depressed participants' sampled moments than nondepressed participants' sampled moments. Although depressive content was evident in the depressed participants' sampled moments, there did not appear to be any consistent depressive content themes among depressed participants. For instance it appeared that depressed participant Sheila often experienced depressive content within her thought content of her sampled moments; depressed participant Matt often experienced the "feeling" of depression within his sampled moments; and depressed participant Sterling often experienced the theme of depression while he was experiencing inner seeing in his sampled moments. Though there didn't appear to be a consistent theme across depressed participants, there did appear to be themes that differentiated the depressed and nondepressed groups. Specifically, distinctions could be made regarding the forms of experience, the feelings that were present, the tone of the moment, the sensations experienced in the body, and anxiety content.

With regard to the form of experience, depressed participants appeared to have substantial individual variability in the relative frequency of inner seeing, feelings, and sensory awareness. However, there was less individual variability in inner speech and unsymbolized thinking between the depressed participants. The most salient characteristics of the depressed group were feelings and sensory awareness. Perlotto (2003) also found feelings and sensory awareness as the most frequently occurring forms of experience in depressed participants' sampled moments.

The frequency of the forms of experience also appeared to be asignificant difference between depressed and nondepressed participants. Specifically, there were differences in the frequency of the forms of the experience between the groups with regard to inner speech and feelings. Inner speech was found at a lower rate in the depressed participant's sampled moments compared to the control participant's sampled moments. This is consistent with a previous study that found a negative correlation between the frequency of inner speech and psychological distress (Heavey & Hurlburt, under review).

Another form of experience that was significantly different between the groups was feelings. Feelings appeared more frequently in the depressed participant's sampled moments compared to the control participant's sampled moments. Cavenagh (2003) also found a higher percentage of feelings among depressed participants compared to nondepressed participants.

The depressed participants' sampled moments contained frequent experiences of feeling sad, hopeless, despondent, dread, or disappointment. There was a higher rate of negative feeling moments compared to positive feeling moments within the depressed group. Similarly, Perlotto (2001) found a higher rate of negative feeling moments

compared to positive feeling moments in the depressed group (4 to 1) than she did in the nondepressed group (1 to 1). The high frequency with which depressed participants' experienced negative feelings suggests that they experienced difficult emotions at an alarming rate. The result of having such a high frequency of depressive feelings may contribute to the maintenance of a depressive state.

Another distinction between the groups was the overall tone of the moments. The control group primarily experienced neutral moments, whereas the depressed group primarily experienced positive or negative moments. This suggests that the depressed individuals experienced more highs and lows in their daily lives.

In addition, the depressed group had an overall negative mean for the rated valence of their experiences, which differed from the nondepressed group who evidenced an overall positive mean for daily experiences. This finding corresponds with those of Cavenagh (2003) who found negative experiences were more evident in depressed participants sampled moments.

Another interesting finding was that there were frequent moments within the depressed participants' sampled experiences that focused on sensory areas of the stomach, neck, shoulders, or back. Often these sensations were experienced simultaneously with a negative feeling or negative thought. This is an important finding as somatization symptoms such as backaches, neck aches, and gastrointestinal pain have high comorbidity with depressive symptoms (Eystein, Ingvar, Alv, & Amstein, 2003). Thus somatization symptoms were prevalent in certain individuals who were experiencing depressive symptoms. Furthermore, a study conducted by Hurlburt (1993) found that depressed participants experienced emotional processing outside of awareness.

One of the depressed participants reported the frequent existence of emotional processing in his physical body, but didn't recognize these emotions in his awareness at the moment of the beep. For example, Derek who had the highest BDI-II score of the participants, but lowest amount of depressive content, reported frequent agitation throughout his body, often unaware of his feelings.

Another disorder that often co-occurs with depression is anxiety (Clayton et. al., 1991). This study found explicitly anxious content evidenced in the depressed group at a much higher rate compared to the control group. The evidence in this study suggests that anxiety occurs at around the same rate as depression does in depressed participants' experience. This supports the frequent finding of high comorbidity between these disorders.

The central goal of this study was to determine if the specific constructs identified in Beck's cognitive theory of depression were reflected in the momentary experiences of depressed individuals. The four constructs – depression, cognitive triad, dysfunctional attitudes, and negative automatic thoughts – identified as key to Beck's cognitive theory appeared more frequently in the inner experience of depressed individuals as compared to nondepressed individuals.

Only the depression construct showed a statistically significant difference between the depressed and nondepressed groups. However, all of the other constructs showed at least a large effect size in the expected direction. These large effect sizes suggest that if this study had a larger sample size, the other differences on the other constructs might have been significant as well. Nonetheless, the large effect sizes in the expected direction lend some support to the notion that the constructs associated with Beck's Cognitive

Theory are found more often in depressed participants' experiences than nondepressed participants' experiences.

Within the depressed participants' sampled moments there appeared to be numerous depressive thoughts related to past incidents of failures, tragic accidents, or being emotionally hurt by significant people from their life. There were also future projected themes of depression evident within depressed participants' thought content such as the inability to meet future expectations, negative projections about themselves, and negative projections of future events. These experiences were consistent with the cognitive triad construct developed by Beck (1964), which indicated that depressed individuals experienced negative thoughts about themselves, their future, and their world. These findings are also consistent with Cavenagh's (2003) study in which she found support for the cognitive triad between depressed and nondepressed participants. Thus, evidence of Beck's cognitive theory of depression can be found in momentary experiences of depressed individuals.

In determining whether or not the four constructs related to the momentary experiences converged with the self-report questionnaire data assessing central constructs in Beck's cognitive theory of depression, I correlated the average ratings of each construct for each individual with their corresponding self-report questionnaire score. Depression, the cognitive triad, and negative automatic thoughts converged with their corresponding self-report questionnaire score, while dysfunctional attitudes narrowly missed reaching significance. This provides evidence of convergent validity between Beck's central constructs found in DES and the corresponding self-report questionnaires regarding Beck's cognitive theory of depression.

Although the four constructs from Beck's cognitive theory of depression were rated as occurring more frequently in depressed individuals, these four individual components did not appear to be distinct from one another. It often was the case that multiple components of Beck's theory were rated as present within a moment of experience and the ratings were highly intercorrelated across moments of experience. This may have occurred because I didn't do a sufficient job describing the constructs to the raters. Therefore the raters may have lacked precision when they rated the moments. These results also might have occurred because the constructs have fundamentally fuzzy boundaries when they are applied to actual moments of experience.

There was also evidence of a lack of distinctness between overall questionnaire scores because of the high correlations between the questionnaires. Thus there was little evidence that the convergence was due to variance unique to the individual constructs. Rather it appeared that there might have been a unitary underlying dimension accounting for the strength of these relationships. Thus although there is evidence for convergence of self-report questionnaires and the nature of the momentary experiences, it appeared to be more attributable to a global underlying dimension of depression than to the more narrow constructs delineated in Beck's cognitive theory of depression.

Finally, these results provided evidence of convergent validity for DES. The questionnaires used in this study all have an extensive history of validation. Thus the high degree of correspondence observed between the ratings of the moments of experience obtained via DES and the questionnaires indicates that DES produces valid descriptions of ongoing experience.

Present Study Limitations

The present study had a number of limitations. First, the sample size was small. The DES procedure is time consuming by nature and thus a larger sample size would have required more resources than were available to the researcher. It is possible that these individuals may differ in some systematic or non-systematic manners from the population. Additionally, a larger sample may have revealed other types of experiences related to depression and it would have provided more statistical power for comparisons between the groups.

Another limitation of the study was the population the participants were selected from. The participants were selected from the college population. Thus the results may only generalize to the college population and may not generalize to the wider population.

A third limitation of the study was the limited number of experiences that were collected. Only four days worth of moments were collected and this may not provide an actual representation of the daily life of the individual. Essentially I collected 24 seconds of the participant's life, which seems like a small amount of time. Nonetheless these few moments of experience from this relatively small sample were sufficient to reveal a number of meaningful differences between the groups and to uncover significant convergence among the moments of experience and the self-report questionnaires.

A fourth limitation of the study was that observed variability in experience may have been due to differences in condition under which people sampled. Participants were free to collect their experiences at their convenience. This may have led to systematic differences in the conditions under which the depressed and nondepressed participants chose to sample.

A fifth limitation of the study was that the operational definition of the constructs associated with Beck's cognitive theory may have been imprecise. Quite possibly with more training or better definitions we could obtain more distinctiveness between the constructs.

A sixth limitation of the study was that the researcher was not blind to the group membership of the participants. Being blind to the participants' group membership proved to be impossible because the symptoms of depression were easily observable in the presentation of the participants.

A seventh potential limitation of the study was that the researcher used the data gathered on the first day. Often DES studies discard the first day of sampling data because the first sampling meeting is considered part of the participants' training. However, an informal comparison of the data from the sampling days indicated there was sufficient similarity in experiences across days to use the data from the first day.

An eight limitation of this study is that the researcher has not been established as a reliable reporter of experience via DES. To gain experience in the DES procedure, the researcher has participated in multiple training interviews with the creator of DES, Dr. Russell Hurlburt, and a well-established DES investigator, Dr. Christopher Heavey. He also studied DES procedure by reading books authored by Dr. Hurlburt and Dr. Heavey, participated in DES laboratory meetings, and transcribed DES interviews done by Dr. Heavey. To minimize this limitation, Dr. Heavey sat in on some of the interviews. Additionally, Dr. Heavey and Dr. Hurlburt viewed some of the videos of DES interviews and concluded that the researcher employed DES appropriately.

A ninth limitation of the study is that the researcher has not established reliability with regard to written descriptions of the experience. In order to maximize the reliability of the description of experience the researcher collaborated with the participant after each experience had been described. Dr. Heavey then reviewed each written description of experience. The researcher has gained experience with regard to written descriptions by writing descriptions of participants' sampled moments while participating in training interviews with Dr. Heavey and Dr. Hurlburt as previously discussed.

Additional evidence in support of the adequacy of the DES and written descriptions comes from the fact that the frequency of the five most commonly occurring phenomena of inner experience found in this study closely resembles the frequency observed by Heavey and Hurlburt (2008). Further evidence that the researcher did an adequate job with his written descriptions comes from the fact that the researcher's characterization of different subjects are different from each other, indicating that active presuppositions did not lead to everyone's inner experience as being described alike. The groups also came out be different from each other on the ratings of the write-ups by the raters, indicating the write-ups didn't all say the same thing. These factors provide evidence that the researcher adequately employed DES.

A tenth limitation of the study is that the researcher did the written descriptions of the moments. These written descriptions were then given to the raters to rate. The researcher may have unknowingly biased the written descriptions of the moments in some systematic way.

Suggestions for Future Research

Future studies should include replication of this study utilizing a larger sample size. A second possibility would be to explore the amount of depressive content within people who experience high levels of anxiety. A third recommendation would be to explore the therapeutic benefits of attempting to increase inner speech and decrease feelings within depressed individuals. A fourth recommendation would be to do a long-term study focusing on determining whether or not distorted cognitive schemas – a component of Beck's cognitive theory – are evident in momentary experiences of depressed individuals.

The last suggestion for future research comes from an observation resulting from the DES procedure made by one of the participants. In this observation Sheila noticed the difference between the frequency of depressive content she experienced during the first sampling day and her subsequent days. Sheila claimed that she engaged in more activities while sampling after her first sampling day. This led her to conclude that by distracting herself she decreased the amount of depressive thoughts in her experience. This observation is consistent with Nolen-Hoeksema's (1991) response styles theory that suggests that depression is decreased by distracting responses to negative feelings and increased by ruminative responses. It would be important to conduct a study to determine if increased activities decrease the amount of depressive content in momentary experiences of depressed individuals.

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APPENDIX 1

QUESTIONNAIRES

Instructions: Rate each moment on a scale on the amount that the person displays the target *characteristic* in the given moment. You will make 2 ratings for each moment, 1 rating per characteristic (below).

1. Depressive Content – The presence of *affective* (i.e., depressed mood, worthlessness, guilt), *behavioral* (i.e., withdrawal, agitation), *cognitive* (i.e., difficulty concentrating, thinking, or making decisions), and *physical* (i.e., insomnia or hypersomnia, fatigue) aspects of depression.

0	1	2	3	4	5	6
Not at All		Slightly		Quite a Bit		Extremely

2. Negative View – A negative view of the self, world, or future.

0	1	2	3	4	5	6
Not at All		Slightly		Quite a Bit		Extremely

3. Dysfunctional Attitudes –Attitudes such as negative conclusions without support; a focus on negative content in a situation while disregarding the rest of the context; assumptions of failure in the future; and distorted patterns of thinking involving minimizing positive aspects of self or experiences or inflating the importance of negative aspects of the self or experience.

0	1	2	3	4	5	6
Not at All		Slightly		Quite a Bit		Extremely

4. Negative Thoughts - Thoughts about worthlessness, hopelessness, past failures, or general self-derogatory beliefs or statements.

0	1	2	3	4	5	6

Not at All	Slightly	Quite a Bit	Extremely

5. Valence – The overall negativity versus positivity of the experience.

-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Extremely Negative		Quite a bit Negative		Slightly Negative		Neutral		Slightly Positive		Quite a bit Positive		Extremely Positive

APPENDIX 2

SAMPLED MOMENTS

1. She was downstairs in her house and walking to the laundry room. She was holding a hanger with her left hand, but wasn't really paying attention to any of the sensory aspects of the hanger. She was seeing the bright whiteness of the door in front of her. She was seeing the top of the door and noticing the whiteness around the rectangular shape that is indented in the door.
2. She was in her room, blow-drying her hair. She was looking in the mirror and holding her hairbrush in her right hand, which was holding her hair, and she was holding the blow dryer in her left hand. She was seeing her hair on her brush and it was blowing. She was also singing a song in her head. She was singing a song called "I'm going to buy you a drink," by T Pain. She was singing the words "I'm going to buy you a drink" in her head in a normal voice.
3. He had just gotten out of his shower and opened the bathroom door and saw his roommate. He saw his roommate's head and his hand to his chin and he looked interested in the TV show that he was watching. He knew that he was watching a show about tornadoes. He was wondering which part of the show was he watching. He was seeing an image of a tornado in his head. At the bottom of the image were big fat letters going from left to right of the word "tornado." Above the word image was a big, gray tornado. The sky behind the tornado was gloomy and black. The tornado image was moving from right to left.
4. She was getting ready for the day. She was feeling upset/mad because her boss had woken her up via phone in the morning. He had called her to come into work early that day. She wondered why he couldn't have called her the night before and why did he have to call me so early. She also felt happy/worried because she was noticing her smile and that her boyfriend had not called her. She was wondering why she is smiling when she should be upset. She also thought that she would think about it later and that she needed to shower.
5. He was text messaging "I love you" to his girlfriend. He was at the word "love" in the text message when the beep went off. He was experiencing a mental image of his girlfriend's face. Her mouth was moving into a smile. The image was in a black background and there were blue/reddish colors. The background was faded. He was aware of thinking that he loved her and knew that she loved him. In addition he had a feeling of overwhelming sensation of happiness in his whole body.

6. He was talking to his sister on the phone. She was describing a pagoda in Thailand. He was experiencing a visual image of a pagoda. It was three stories tall and predominantly red with blue trim and a curved roof. He was focused on the upper part of the pagoda. This image seemed to be in his head.
7. He was emailing a connection of his who lives in the Philippines. He was typing about his alcoholic past. He was feeling remorse and sadness. He describe this feeling as a huge sense of despondency. It was accompanied by a nauseous feeling in his stomach. He also had an image of a head-on car crash viewed from the side from about 50 feet away. In his image the cars were just coming into contact; this image is a reconstruction of a crash he was involved in years ago while he was driving drunk. He doesn't remember the details of the crash because he was drunk, but this is the image he has recreated of what he thinks it was like. The cars in his image were generic and lacked details such as color.
8. He was watching the 3-6 music video. He was focused on one of the singer's teeth. He saw dark silver grills that were spaced apart. He was focused on the top row of teeth and top lip. He was noticing that his teeth are spaced apart more than usual. He was wondering how does he get chicks.
9. He was eating a subway sandwich in his room. He was looking at the peppers in his sandwich and was noticing the yellowness of the peppers. He describes the pepper's yellow color to be similar to that of light colored urine. At the moment of the beep he could also taste in his mouth a hot mild sensation from eating the peppers. The sensation was tingly, and was experienced on the right corner of his lips and his tongue.
10. He was walking to a class and listening to his friend talk about an upcoming fight on the weekend. His friend was saying "I got a fight this weekend." There was sunlight in his face. He could feel himself squinting his eyes because of the sunlight. More specifically, he noticed it more in his left eye that was a slight squeeze.
11. He was looking at a picture of one of his friends on facebook.com. He was thinking that his friend had a really weird haircut and was saying to himself in his head "what a weird haircut." He was also seeing the picture and saw the guy's head and saw blonde hair hanging down covering his forehead. The guy in the picture was also making a goofy face. The rest of the picture was dark purple and black. He was feeling at a low level the experience of shock. It was experienced in the back of his head.
12. He was driving his car and listening to the radio. He had just heard a funny story from the radio hosts. He was grinning and laughing and this was experienced in his upper stomach on his left side a bit smaller than a fist. He had a feeling of funny and lightly relaxed by not being tense, like a nice aura throughout his body. He also was having mental laughter and just knowing that the story was really funny and that something that just happened was funny. He knew he was laughing and it was residual from the story.

13. She was in her room on her computer looking at myspace.com. She was thinking to herself that she needed to check her other email account. She knew that it was rebel mail that she needed to check and that she was reminding herself.

14. He was eating a pickle in his kitchen. He was thinking to himself, which is better Klauson or Karneki deli pickles. He was also experiencing the crunching of the pickle in his teeth. He could also taste the sourness of the pickle.

15. He was on his couch and daydreaming about school. He was wondering how different it would be if his girlfriend went to school with him. He experienced a moving image of him walking with his girlfriend with his arm around her side on the pathway walking down the walkway between the library and the CDC trailers. He was focused on him and his girlfriend with the library and random people faded in the background. They were both wearing jeans and a black shirt with their bags. He was on the left of her and saw this scene as if he they were moving a little bit slower. In addition, he saw the scene as if he was rotating from the left to front to right for 180 degrees.

16. He was about to shave. He was saying to himself in his head "I'm going to cut my pimple." He saw an image of just his upper lip to nose. He saw hair and one pimple. The pimple was located on the left of his upper lip. The image was as if it was zoomed in and appeared large. He saw black hair with no background.

17. She was on her bedroom floor, going through her dresser and throwing away old papers from high school. She had found her cookbook and was noticing the royal blue color of the cover of the cookbook. The cover also had stars on it. She was thinking to herself, that this is her cookbook, that there are only two recipes in it, and that she was also remembering the history she had with the cookbook.

18. She was in her bathroom, brushing her teeth. She was looking in the mirror and noticing herself brushing her teeth. She was seeing the toothbrush (mechanical) and watching the toothbrush go across the top and bottom rows of her teeth. She also tasted a strong taste of cinnamon toothpaste in her mouth. She tasted it on her tongue.

19. He was with his dad thinking about what gift to give his dad for his birthday. He saw an image from the 1st person point of view of his dad receiving the gift. He saw his dad in the center of the image at a table. To the left and right of the dad were 24 family members. His dad had his hand stretched out receiving the gift. His dad opened the birthday bag, but before he could see in the bag the vision ended. He was focused on seeing his uncle on his dad's right, his mom on the dad's left, grandma on mom's left, and everybody else was faded. There was a black background and shades of blue, gray, and green in the scene. However, his grandma was wearing orange. He could also feel excitement in his upper body that was experienced as blood rushing through his veins.

20. He was watching TV in his bedroom. He was flipping through channels and ended up on the series called "workout." He was feeling anxious which was associated with the sensation of "butterflies" in the left side of his stomach. He was watching a scene of girls being touchy feely.

21. He had just gotten out of his shower. Two of his friends had left and one of his friends was supposed to come back. He was looking down his spiral staircase in anticipation of seeing one of his friends come back. He was seeing his marble floor, but was focused on a vivid sky blue color on the floor. He was having a feeling of urgency and frustration that was experienced as a strong tenseness in his shoulders and neck. Part of the feeling was wondering where was his friend was, and thinking that he had to leave and she wasn't there.

22. He was riding the bus on his way to ride his bike in Red Rock canyon. He was thinking about stopping to get refreshments. At the moment of the beep he was thinking about what he wanted to drink. He was debating between multiple sports drink and the amount of carbohydrates. He was going to pick the one with the least amount of carbohydrates.

23. He was at home text messaging his girlfriend and thinking about how much his girlfriend means to him. He had a thought about how he wouldn't be who he is if she didn't make him who he was. He had a feeling of happiness.

24. He was listening to his sociology teacher. He was focused on looking at him. The teacher was walking back and forth, pacing. He was listening to his professor say "in a culture of that sort." He was seeing his professor sideways to the right. He was seeing him from his elbows to his face. He had a pointer (projector clicker) in his left hand. He also could see chairs with nobody in them and that was sort of blurry.

25. He was sitting on his couch watching TV. He had a mental image of his girlfriend smiling and hearing "I love you." He was hearing her say it in her voice but a little bit quieter than normal volume. The image that he experienced was of her face and her mouth was moving towards a smile. He saw from the top of her head down to her neck. He saw it from his own perspective and saw her face as a light shade of blue and her hair as brown and blue. The background was black and he experienced this in his head.

26. He was on his couch and was excited about spending time with his girlfriend tomorrow. He was feeling a presence of excitement throughout his whole body. It felt like a pendulum swinging from the bottom of his body up. The pendulum was moving like a bouncing ball and ended at his heart. It felt really good like a 9 out of 10.

27. He was getting all his stuff together to leave his friend's dorm room. He was looking for his wallet prior to the beep. He was saying out loud "how the hell did it get here?" in an inquisitive /suspicious voice. He was feeling dread because he was leaving and he didn't want to go home. He was feeling in his whole stomach a slight sensation of butterflies related to the dreadful feeling.

28. He was reading a text from his girlfriend saying that when she thinks of him, she smiles. He had a good feeling, like everything was perfect. It felt like a lifting feeling, like negative thoughts went away. He also had an idea of thinking of her and understanding why she would be smile.

29. He was typing up a research paper. He was typing the word "singularity," but he was not really paying attention to typing. He was saying to himself in his head, "I got to get this done." He was feeling worried and this was experienced as coldness throughout his body. This feeling was connected to thinking about trying to get his paper done and being eager to get his paper done. He was feeling tense in his shoulders and neck. He was also feeling anxious that was experienced as butterflies in his stomach.

30. He was in his theater room. He was feeling dread because all he wanted to do was just chill, relax, and sit and watch TV. He had to leave for an appointment. He was looking at the TV screen and MTV was on. He was not focused on anything in particular. He felt like he was staring through the screen and noticing the color red.

31. He was working at his restaurant. A couple came into the restaurant. The girl was really hot and wearing very revealing clothes. He had dropped salsa when he was trying to bring them chips. He was having an image of seeing the guy get up from his table and coming over to him and saying "why you checking my girl." He saw this from the 1st person perspective. He could see the guy from his shorts up. The guy had a lot of tattoos, a red muscle shirt, and black, red, white swim trunks. The guys face looked mad with his eyebrows together. The girl was in the background smiling at him. The guy walked past three tables. He was thinking that the girl was wondering why would he want to get his ass kicked and he was hoping the guy didn't think he was checking out his girl.

32. She was in her room doing her homework. She had just finished reading a newspaper article prior to the beep. She was thinking about the article and Harry Reid. More specifically, she was thinking that he was an idiot. This was experienced in her head.

33. He was getting ready to get into the shower. He was in his room sitting down. The beep went off and he had no experience.

34. She was watching a movie in her bedroom. She was thinking that she liked the girl's outfit on the show. She was focused on the girl in the movie and saw her from head to toe. The girl had a dark blue/dark green plaid jacket. She was seeing an image of herself in her head wearing the exact same outfit. She saw her whole body with a green tank top and wearing the same jacket. The jacket was open in the image. She also had dark blue jeans and white/gray puma sneakers on. She thought that she looked good in that jacket in the image in her head.

35. He was downstairs eating dinner. He was noticing food in his mouth, which tasted good, and he was enjoying it. He was feeling worried that was experienced as tension in his neck and shoulders. This feeling of worry also was linked to a loss of appetite in his stomach. He knew that he couldn't eat all of his food, that his stomach was sick, empty but full, and felt like it was going down a roller coaster. Before the current moment he had text messaged a friend. At the moment of the beep, he was wondering when he would receive a text message from his friend.

36. He was talking to his mom about AFLAC insurance. He was thinking it was a good amount they were giving him for a short-term disability. He was speaking to his mom and saying, "this was a good amount." He felt his shoulders through his head being lighter which was attributed to happiness.

37. He was eating chips on his couch. He was pondering what was due on Tuesday. He was thinking quickly through his mind about classes, tests, quiz, work, what teacher said, and what was due on Tuesday. He experienced this in his head.

38. She was watching "Happy Feet" the movie at her home with her little cousin. She was feeling really silly and was in the process of picking on her cousin. The beep hit when she was in the middle of reaching over to poke her cousin. She saw on the TV screen two little penguins swimming close together in light blue water. The background had dark blue water and icebergs.

39. He was studying with a lot of focus on his biology test. He had an image in his head of bond angles of hydrogen and molecular genetics. More specifically, it was a 3D image of red, yellow, and purple ribbons of protein folded in a special way of hydrogen bond.

40. She was on her computer in her room looking at myspace.com. She was looking at her cousin's website. There was a picture of two guys making out and her cousin's comment on the screen was "this is hot." She was saying to herself in her head, "my cousin is freaking weird." She was saying this in a shocked voice.

41. He was at his work and was sitting down thinking about the psychology quiz he was going to have that day. He was seeing an image of himself sitting at a gray desk. In his mental image he could see on his desk a sheet of papers tacked to his left and one sheet in front of him. He saw grape juice on his right side and he could barely make out a piece of bread on a napkin in front of him. He saw his back with a white shirt and boxers. The background had a window with brown shudders and shades of blue on the wall. He was also wondering how he is going to do on the quiz, if he had time to study, and if he had studied enough.

42. He was standing on his staircase talking to his dad. He was saying out loud "Buffalo Wild Wings would be a good place to have a pool table." He was having a visual image of where to put the pool table. He saw a wooden room with two wooden pool tables with black cloth on them. The room was dark and it was viewed from the 1st person perspective.

43. She was in her room sitting down looking at her nails. She wasn't focused on her nails; instead she was focused on her thoughts. She was trying to justify her selfishness by balancing it out by doing something else. She was thinking about bringing a child into the world at the moment of the beep and that that would make her selfless. The selfless realization came after the beep.

44. He was in his room and was thinking to himself he hopes his roommate doesn't spray an air freshener. He was seeing an image of a bottle that looked like the air freshener. The bottle was white with green leaves on it. The cap was light green. He also saw a separate image of a lime to the right of the bottle. The lime was smaller than the bottle and was seen as green. He was also having a gassy sensation in his stomach. It was felt in his lower stomach and it was about the size of a volleyball. He was sensing the tightness of it.

45. He was saying goodbye to his girlfriend at his truck. He was seeing sadness in her eyes, which crushes his heart. He felt bad, crushed, and disappointed in himself.

46. He was taking his test and was in the middle of answering a question that he was confident in. He felt good, happy, and joyful all over his body. He also could see himself in a room with his parents. They were all talking but with no sound. He saw this scene from behind himself and looking at his parents. He could see everybody from the waist up. He was about 3-4 feet away. The mom was on the left, TV in the background, no boundaries in the scene, and his parents were smiling. He could see his mom's lips moving and he could lip-read her saying "studying paid off." He thought he was showing his parents he was doing well and that they were happy.

47. He was using a computer. He was trying to connect to wireless, but it wouldn't work. He felt angry. He felt a mini heat burst in his forehead area. He saw himself in a black scene with a spotlight on him from the front view. He was wearing black trousers and a burgundy polo shirt. He saw his lips moving and hearing himself say "why are you so retarded, why did you buy the cheap computer." He was seeing the scene as if he was moving around it in 360 degrees.

48. He was reading a story in the *New York Times* about Elizabeth Edwards. He was her having cancer and the fact that she was still smiling. This thought was represented by an image of her smiling face with a "twinkle in her eye." He only saw her face, which was in appropriate colors.

49. He was lying down on his bed and was starting to fall asleep. He was feeling his arms and legs were relaxed and there was lightness between his thighs and calves on both legs. He was also noticing looseness from his shoulders through wrist and was centralized in his biceps and wrists. His head was on his pillow and he was feeling the softness of the pillow on the back of his head and his neck. He described it as having a chi in flow with the pillow.

50. He was in his classroom sitting down. He had just received his test score back. He was experiencing a feeling of excitement. He was happy and shocked for receiving a 100 on the test when he was thinking that he was not going to do well on the exam. He was also feeling adrenaline in his stomach on his left side that was intense. It felt like a burst of energy the size of a cantaloupe and was warm.

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