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## Examining experience in depressed and nondepressed individuals

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EXAMINING EXPERIENCE IN DEPRESSED AND NONDEPRESSED  
INDIVIDUALS

by

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Bachelor of Arts  
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A dissertation submitted in partial fulfillment  
of the requirements for the

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## ABSTRACT

Examining Experience in Depressed and Nondepressed Individuals

by

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The inner experience of nine depressed and nine nondepressed individuals was explored using Descriptive Experience Sampling. Each participant completed four days of descriptive experience sampling, exploring about six moments of their inner experience on each sampling day. Although the Depressed participants self-reported substantially higher levels of depressive symptomatology on the Center for Epidemiological Studies Depression scale (CES-D) on each day of sampling, the differences in the frequency of depressive symptomatology in the inner experiences of these two groups were not statistically significant. Despite the group differences not reaching statistical significance, the Depressed group experienced somewhat more frequent moments of depression, anxiety, fatigue, body discomfort, negative feelings, negative content, and fewer instances of positive feelings and content than the Nondepressed group. The two groups experienced the five most frequent phenomena of inner experience identified in prior DES studies (inner seeing, inner speaking, unsymbolized thinking, feelings, and sensory awareness) at similar rates. Moments reflecting constructs related to depression, such as Beck's Negative Cognitive Triad, were either very infrequent or absent. Overall, differences in the inner experience of the depressed and nondepressed participants observed via descriptive experience sampling

were much less pronounced than the differences in their global self-reports of depressive symptomatology via the CES-D. The implications and possible reasons for this are discussed.

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# CHAPTER 1

## INTRODUCTION

A depressive episode is made up of a cluster of symptoms that can debilitate a person for an indefinite period of time. Typical symptoms of depressed individuals involve distorted negative thinking, a sluggish/lethargic demeanor, and a sad/dejected emotional state. The symptoms not only impact a person over an extended period of time, they also are evident in a person's momentary daily experiences. Examples of what it is like for a depressed individual to experience moments of depression can be viewed in the following moments collected by Gunter (2008). A 51-year-old "was emailing a friend who lives in the Philippines. He was writing 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 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" (Gunter, 2008, p. 131).

A depressed 19-year-old male "was in his kitchen and he was standing up reading a birthday card from his dad's girlfriend. He was focused on the number '18,' which 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 were

giving him a card a week late. He was also feeling a low level of sadness that they had forgotten his age and anticipation in his stomach that was experienced as butterflies in response to waiting for his friend” (Gunter, 2008, p. 79).

A 19-year-old depressed female “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 experiencing an image of what happened when her friend had committed suicide. The scene was mainly in black and white. She saw the scene from about 40 feet away 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 wearing a black shirt. Her friend was angled to the side with her stringy 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 which had a bright blue comforter” (Gunter, 2008, p. 72).

An 18-year-old depressed male “was outside of his car at his family’s restaurant. He saw his aunt’s car and was wondering why his aunt’s car was there and not his mom’s. He had an image of a car accident. In this image he saw his mom’s car after it had been hit by a semi-truck. He could see the front of the truck at a bit of a side angle. It was slightly damaged. He felt like he was walking around the corner and saw his mom’s Ford Explorer. The tires were missing, it had shattered windows, the hood was gone, and the rear door missing. He could see a lot of blood on the driver’s seat and stereo. The blood was very vivid. 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” (Gunter, 2008, p. 82).

Detailed moments of depressed experiences such as these may reveal the unique characteristics of depression for an individual. Depression has many commonly occurring symptoms across people that are displayed both behaviorally and cognitively; however individuals may experience these symptoms in different ways or in different forms. For instance, in the first example involving the 51-year-old male, his moment of depressed experience was in the form of inner seeing, whereas the second example involved an 18-year-old male whose depressed experience was in the form of a feeling, perceptual awareness, and unsymbolized thought. The detailed experiences of depressed individuals revealed in these snapshots of conscious awareness have not been fully explored in a large sample of depressed individuals. A collection of detailed portrayals of moments of experience has the potential to reveal invaluable information about what it is like for different individuals to experience depression.

To meet criteria for a major depressive episode as specified by the DSM-IV-TR (APA, 2000), a person must experience five symptoms of depression for at least two weeks. One of these symptoms must be either a depressed mood (feeling sad or irritable) most of the day, nearly every day or a loss of enjoyment in pleasurable activities. Additional possible symptoms include: significant changes in weight; significant changes in sleep; significant changes in motor activity; loss of energy or fatigue; inappropriate or excessive feelings of guilt or worthlessness; diminished ability to think or concentrate; or frequent thoughts of death or suicide. Criteria for a minor depressive episode would be met if a person meets two to four of the symptoms with the same severity and duration.

The World Health Organization (2005) estimated that more than 121 million people worldwide experience depression. Epidemiological research done in the United

States, however, reveals rates of depression much higher than the estimate by the World Health Organization. For example, Kessler et al.'s (2003) epidemiological study of major depressive episodes revealed that up to 17% of individuals in the United States meet criteria for a major depressive episode at least one time in their life. The DSM-IV-TR (APA, 2000) reported that 10%-25% of women experience a major depressive episode while the rate is 5%-12% for men. In a given year it is estimated that 6.6% of individuals will meet criteria for a major depressive episode (Kessler et al., 2003). Point prevalence studies reveal that women (5%-9%) are more likely than males (2%-3%) to experience a major depressive episode (APA, 2000). Community surveys have reported as many as 20% of adults will experience a major depressive episode (Kessler, Avenevoli, & Merikangas, 2001) while structured diagnostic interviews typically find the point prevalence of a major depressive episode to be as high as 6% for adolescents (Kessler, Avenevoli, & Merikangas, 2001) and as high as 4.9% for adults (Kessler, 1994). The discrepancy between the community surveys and structured diagnostic interview studies may be due to people experiencing minor depressive episodes and not meeting full criteria for a major depressive episode (Gotlib & Hammen, 2002).

Most commonly, the first episode of major depression occurs in the mid 20's, often after a severe psychosocial stressor (APA, 2000). Symptoms of depression usually develop over days or weeks and may last for months at a subsyndromal level (APA, 2000). If a major depressive episode occurs but is left untreated, that person can expect to be experiencing a depressed mood for four months or longer (Kessler et al., 2003; APA, 2000). Fortunately, most people who experience a major depressive episode have complete remission of symptoms and return to normal functioning (APA, 2000).

However, 5%-10% of depressed individuals continue to meet full criteria for two or more years (APA, 2000). Depression at its worst may lead to a person committing suicide.

Not only does depression cost society lives, it also has significant monetary effects in terms of work related loss of production and health services provided. It is estimated that major depression is responsible for an annual \$52 billion dollars being lost due to work absences and productivity reductions in the US labor force (Greenberg et al, 2003). Furthermore, \$26 billion is spent annually on health services for the treatment of depressive symptoms.

To measure the toll that various illnesses take on society, the World Health Organization has developed the concept of disability adjusted life years. Disability adjusted life years is measured by the number of years of potential life lost due to premature mortality and the years of productive life lost due to disability. To date, depression is ranked second among 15-44 year olds in terms of disability adjusted life years; it is predicted to rank second to cardiovascular conditions for all ages by the year 2020 (WHO, 2005).

Nearly three-fourths of people who experience a major depressive episode will experience at least one other DSM-IV-TR disorder in their lifetime (Kessler et al., 2003). Anxiety disorders appear in 59% of those who have experienced a major depressive episode. Substance abuse disorders (24%) and impulse control disorders (30%) are also found at elevated rates among people who have experienced a major depressive episode (Kessler et al., 2003). The high rate of comorbid symptoms has made it difficult for researchers to apply a specific depression theory to a pure sample of depressed participants.

A plethora of research has been generated in an attempt to test the validity of reputable theories of depression. This research, taken as a whole, suggests that the leading theories of depression cannot completely explain the onset and maintenance of depression. Researchers have employed numerous methodological strategies focused on understanding the experience of depression. However, most of these methodologies involve a depressed person describing his/her experience of depression retrospectively, often long after it has occurred. This is potentially problematic because research has shown that participants experiencing psychological symptoms make errors and distort recall of events or feelings (e.g., Lewinsohn & Rosenbaum, 1987; Wells, & Horwood, 2004).

Depression research also indicates that the leading theories of depression cannot completely explain the different manifestations of depression unique to each individual. To complicate things further, most depression theories are based on specific schools of thought. Each researcher has his/her own methodological strategy and real life experiences that influence his/her perception of how depressive symptoms are manifested in each individual. Thus depression researchers have sometimes used unique methodological strategies that have tapped into different aspects of depression.

To date, several large scale studies have investigated the symptomatology of depression (e.g., Beck, Ward, & Mendelson, 1961; Radloff, 1977); few studies, however, have carefully examined the momentary experience of depressed individuals. The current study will carefully examine the unique experience of depression in a group of individuals using the descriptive experience sampling method (DES; Hurlburt, 1990, 1993). DES is a method designed to facilitate the faithful apprehension of moments of

inner experience. In DES participants are randomly cued by a beeper to attend to specific moments of experience. Participants then write down notes about their experience at the moment of the beep and take part in an expositional interview about these moments within 24 hours. The goal of these interviews is to develop faithful descriptions of 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). Several prior DES studies have explored depression using small samples consisting of three to six participants (Hurlburt, 1993; Perlotto, 2001; Cavenagh, 2003; Gunter, 2008). Tentative nomethetic characterizations were made by these studies. This study will use a larger sample of depressed individuals potentially allowing us greater confidence to discuss the nature and variability of experience during depression.



## CHAPTER 2

### LITERATURE REVIEW

Since the beginning of psychology, researchers have invested a great deal of heart, money, and time into understanding people's inner life. For instance, the very first psychology research lab, established by William Wundt in 1879, was dedicated to this cause. The methodological strategy employed by Wundt was called introspection. The goal of introspection was to obtain accurate reports of an individual's thoughts, feelings, or sensations. Introspection was used to gather data in natural and contrived circumstances. As interests grew in the method it quickly became the standard tool used in psychological research.

At the beginning of the 20<sup>th</sup> century, two researchers, Wundt and Titchener, were leaders in introspective research. Wundt used introspection in an attempt to measure the speed of various psychological processes. This effort was called "mental chronometry." Titchener choose to focus his efforts on cataloging mental elements. Titchener's goal in cataloging mental elements was to provide a psychological analogy to the periodic table of elements found in chemistry. Wundt and Titchener cataloged 240,070 mental elements (Adams, 2000). Despite the enormity of these finding, researchers of the time choose to focus on the disagreement among introspectionist including the concept of imageless thought (Adams, 2000). The disagreement was pivotal to the demise of introspective research in the psychological community. Following Titchener's death in 1927, the introspectionist movement became dormant for more than a half century (Adams, 2000).

As the years passed new methods became the central focus of the field of psychology. After introspection faded from the scene in the early part of the 20<sup>th</sup> century, behaviorism became the dominant method of research for psychology. Behaviorism appealed to the psychological community because it limited psychological study to overt behavior that could be easily quantified and measured. After decades of behavioral research had been undertaken, consensus grew that the behavioral mechanisms of learning and conditioning could not account for all important psychological processes. For example, Chomsky's (1959) research with infants led him to conclude that individuals could generate words that had never been spoken before. This conclusion conflicted with the behaviorists' belief that language could only be learned through operant conditioning. Chomsky's findings set in motion another renaissance in the field of psychology. Similar to introspection declining in favor of behaviorism; the study of behaviorism was gradually eclipsed by cognitive psychology and eventually the broader discipline of cognitive science. Once again there was renewed interest in people's inner life.

Cognitive science is an interdisciplinary field that involves psychology, neuroscience, linguistics, philosophy, computer science, anthropology, biology, and physics. Disciplines of cognitive science and neuropsychology are primarily interested in understanding the functioning of the brain; they employ a variety of methods to gain this understanding (e.g., studying reaction time or conducting brain imaging with fMRIs). The increasing popularity of cognitive science and neuropsychology has coincided with revived interests in inner life. Inner life can include a variety of characteristics, such as cognitions, feelings, sensations, perception, etc.

Numerous methodological strategies have been developed in an effort to study people's inner experience. However, the methods used differ substantially, each having relative strengths and weaknesses. Moreover, some methods may well be better suited to exploring inner experience than others. The most common current strategies for studying inner experience are questionnaires and clinical interviews. Unfortunately there is substantial research that calls into question the extent to which people can accurately characterize their inner experience as requested by such methods (Hurlburt, Heavey, & Seibert, 2006). In the next section I will discuss the general methodological issues one should consider when trying to understand the nature of people's inner experience.

#### *Methodological Considerations When Studying Inner Experience*

Hurlburt, Heavey, and Seibert (2006) identified methodological issues involved in research on inner experience and provided guidelines for how researchers might address these issues. They concluded that there are many issues that influence the accuracy of reports about inner experience. Two overarching issues include the ability of participants to accurately recall their experience (i.e., memory-related issues) and the extent to which measurement procedures can affect the reports of inner experience. Memory issues that need to be considered in research on inner experience can be broken down according to the stages of memory: encoding, storage, and retrieval. Potential procedural measurement issues include reactivity, ecological validity, and demand characteristics. Each of these issues will be addressed in turn.

The encoding stage of memory involves the initial step in the stimulus being imprinted into the individual's memory. Stimuli can enter the individual's memory from

any active working sensory receptor. A problem that may occur during this initial encoding stage is the target stimulus may not have been sufficiently encoded. Thus, if the stimulus was not encoded, it will have no chance of proceeding to long-term memory. If the stimulus does not proceed to long-term memory, then later retrieval of the stimuli will be impossible. Stimuli may not be encoded in an individual's memory for a variety of reasons such as the individual's lack of attention to the stimuli or the individual being bombarded by competing cognitive information. Even if the individual is able to encode a specific stimulus, research has shown that an individual's memory is susceptible to numerous types of errors in the encoding stage such as: focus, perception, understanding and expertise (Haber & Haber, 2000). For example, with regard to an individual's focus on stimuli, attention will be centered on the stimulus that is of the utmost interest to the individual. Generally, people have a wide-range of attention. However, some features of an event can cause involuntary narrowing of attention, resulting in some details of an event not being attended to at all. Therefore an individual may have only encoded what s/he had focused on (Haber & Haber, 2000).

Deficits in a sensory area may also interfere with a person being able to report accurately the details of the stimuli. For example, if Joe needs glasses to see clearly, he may report more accurately visual stimuli when viewed with the glasses than when viewed without them. Joe without glasses may need or be inclined to use his imagination to report the details of the event. Similar problems may occur with the recall of inner experiences. If the individual was not adequately attending to the inner experience, then the individual may "fill in the blanks" using his/her beliefs or other available information when later reporting on that experience (Haber & Haber, 2000).

The belief and expectations an individual uses to organize and understand a stimulus during encoding can also be a problem. Allport and Postman (1947 cited in Haber & Haber, 2000) did a study in which individuals saw one of two scenes: two white men with one of them holding a knife; and one white and one black man with the white man holding a knife. After a period of time had passed, the participants were asked to describe the scene. Participants in the first condition all correctly described which man held the knife; however, most participants in the second condition identified the black man as having held the knife. Even some of the individuals in the second condition who correctly identified the white man as holding the knife choose to describe the white man as defending himself. The results of this study suggest that encoded stimuli can be influenced by one's beliefs.

Similarly, Bartlett (1932, cited in Haber & Haber, 2000) asked participants to read descriptions of a sequence of events. Participants were divided into two groups. The first group read the description of the events that were logically ordered in terms of one's expectations. The second group was given the same description but in an unordered way. The participants in the first condition remembered and reported some of the events with accuracy; however, the participants in the second condition were inaccurate in their reporting of the event. The participants in the second condition frequently reported the unordered sequence of events in a logically ordered way. Bartlett interpreted this finding as indicating that an individual sometimes encodes stimuli in a way that fits his/her expectations.

A fourth potential problem in encoding stimuli is the individual's familiarity or expertise related to the stimuli. An individual who is an expert in a field may interpret

stimuli differently than the layperson. For example, if there were a loud rumbling noise coming from a car's engine, a car mechanic would likely interpret the engine noise differently than would the layperson. Thus, these four factors (focus, perception, understanding, and expertise) can affect the encoding of a specific stimulus.

The storage stage of memory is also susceptible to errors in the individual's process of remembering and recalling details of an event. Specifically, this stage of memory is susceptible to errors involving memory capacity and decay. Miller's (1956) research has led him to conclude that people do not have an unlimited amount of information that can be processed, received, and remembered. Miller discovered that most people only have the ability to remember and produce seven plus or minus two chunks (e.g., digits, letters, words) of information in short-term memory.

Memory decay has been shown to influence what stimuli will make it past the storage stage of memory and into long-term memory. Rubin and Wetzel's (1996) concluded that individuals are susceptible to a rapid loss of information following an event. Furthermore, the accuracy of the recall of information becomes even poorer as time increases relative to the occurrence of the event (Bernard, Killworth, Kroenfeld, & Sailor, 1984). Tourangeau (2000) developed a mathematical formula in an attempt to calculate the amount of information that can be retained as a function of time. Tourangeau concluded that memory decay increases monotonically over time; however, it occurs rapidly at first then slows down.

The storage stage of memory can be influenced by a number of factors including the primacy effect. The primacy effect is the phenomenon of remembering more stimuli at the beginning of a sequence than stimuli at the end of the same sequence. This

phenomenon possibly occurs as a result of the limited time available for rehearsal and/or the decrease in the ability to process new stimuli as information continues to be presented. Furthermore, rehearsal (Atkinson & Shiffrin, 1968), processing ( Craik & Lockhart, 1972) and lexical status of the contents (Hulme et al., 1995) can influence when stimuli make it through the storage stage of memory. Research on the primacy effect and memory capacity and decay suggests that an individual's ability to provide accurate recall of information following an extended delay must be looked at with skepticism.

As information proceeds through the storage stage of memory and into long-term memory, a person will have to access long-term memory in order to produce an answer to a question. The process of recalling information can be referred to as the retrieval stage of memory. The ability to retrieve specified information can be enhanced by associations, contexts, or mood. The retrieval stage of memory can also be prone to errors. Specifically, an individual's recall of information can be influenced by semantic versus episodic access (Tulving, 1984, 1993) and biasing effects of mood-congruent and state-dependent memory.

When retrieving an answer to a question, the question itself can influence the type of memory that an individual will use to access his/her answer. The type of memory that people will access in answering a question is either semantic or episodic memory (Robinson & Clore, 2002). Semantic memory holds memories of meanings, understandings, generalizations, and knowledge unrelated to specific experiences. Semantic memory is thought to be relatively immune to interference and forgetting (Tulving, 1993). Episodic memory can be accessed when an individual is asked to report

on particular lived events or experience. Episodic memories include experiential details including such things as time, place, and associated emotions. Robinson and Clore (2002) stated that people's ability to access their episodic memory declines greatly after a week. Both semantic and episodic memory may be accessed in any given question. The implication of the question can dictate which answer the participant is able to access., however, it is also likely that a person will have no access to an episodic memory related to some fact or belief regardless of what question they are asked.

A question that requests a person to characterize his/her experience over time may well draw on semantic memory for retrieval of the answer (Tulving, 1984, 1993). This is potentially problematic because of the distortions involved in semantic memory (Robinson & Clore, 2002). Robinson and Clore (2002) provided a review differentiating between emotion (episodic, contextual) and beliefs about emotion (semantic, conceptual). In their review, they explained that 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. As details are lost, the memory of an emotion shifts from episodic memory to semantic memory. Once semantic memory has taken over for an event, other retrospective biases may become involved, such as belief-consistent bias.

An example of belief-consistent bias can be seen in a study by McFarland and Ross (1987). They followed a number of romantic relationships over a two-month period. At the beginning and end of this two-month period the couples were asked about their perception of their romantic relationship. In addition, at the end of the two-month period the couples were asked to recall what their feelings had been at the beginning of



the study. The results of the retrospective reports appeared to be systematically biased in the direction of their current perceptions at the end of the two-month period. This led the researchers to conclude that a person's beliefs can have direct effects on retrospective reports. Specifically, estimations of prior feelings may be prone to errors.

Methodological strategies that invoke episodic recall are ideal for minimizing errors associated with retrieval of memory. Specifically, an ideal study will target recent, specific, clearly identified moments, thus minimizing biases associated with semantic memory, such as self-theory bias, confirmation bias, and pre-existing schemata (Hurlburt, Heavey, & Seibert, 2006).

Accuracy in retrieving information from memory can also be influenced by the state of mood the individual is experiencing at the moment of recall. Mood-congruent memory is the term that is used to describe this phenomenon. For instance, Safer and Kueler (2002) asked prospective therapy clients to complete a measure of symptomatic distress prior to enrolling in therapy and after terminating therapy. The researchers found that clients tended to overestimate their pre-therapy stress to a greater extent than a control sample. The researchers suggested that the results indicated that the clients believed they were experiencing more positive change over time.

Similarly, Lewinsohn and Rosenbaum's (1987) study of depressed participants' recall of parental behavior indicated that present level of depression significantly affected descriptions of how loving and rejecting their parents had been. Furthermore, Denny and Hunt (1992) conducted a study with individuals who were experiencing depression. They reported that the depressed individuals recalled negative emotions at a higher frequency than what had actually been reported at the time of experience. In addition,

Beck (1967) and MacLeod and Matthews (1991) reported that individuals experiencing depressive symptoms recalled significantly more negative self-referential material than what was actually experienced. Thus a participant who is completing a self-report questionnaire may be influenced by the state of mood s/he is currently experiencing. Specifically, an individual who is experiencing depressive symptoms may endorse more mood congruent items and may rate items relating to negative affect as more frequent and more severe than actually experienced.

The phenomenon of mood-congruent memory not only affects people who are experiencing psychopathological symptoms, it can affect people who are considered free of psychological distress. Natale and Hantas (1982) concluded from their research with psychological distress-free individuals that, depending on the person's present affective status, an individual might bias his/her perception of past states of mind. Thus, all participants can be susceptible to mood-congruent memory bias.

Accuracy in the retrieval of information from memory can also be influenced by state-dependent memory. Research has shown that the internal physiological state (Eich et al., 1975) and physical surroundings (Eich, 1980) of the individual can influence what s/he may recall at a later time. For example, Eich et al., (1975) conducted research on the effects of smoking marijuana on learning. The research design for the study was made up of four different conditions: encode under the influence of marijuana placebo—recall under the influence of a placebo, encode under the influence of a placebo—recall under the influence of marijuana, encode under the influence of marijuana—recall under the influence of marijuana, and encode under the influence of marijuana—recall under the influence of a placebo. The placebo-placebo group obtained the highest scores of recall

of information. Interestingly, the marijuana—marijuana group recalled more information than the marijuana—placebo group. Saufley et al., (1985) has also shown that the environment that an individual is in at the time of testing and at a later recall time can influence the recall of information. Specifically, Saufley et al., found that recall of information was greater if the individual was in the same environment at recall as s/he was in during encoding. Thus the internal physiological state and physical surroundings can influence an individuals' retrieval of information.

Collectively, the research on memory associated with the encoding, storage, and retrieval stages suggest that individuals are susceptible to a variety of memory errors. Any of these concerns can influence the accuracy of the participant's responses. As influential as memory can be on the accuracy of an individual's response, measurement procedures may be just as important in obtaining accurate reports of inner experience.

Procedural measurement issues include reactivity, ecological validity, and demand characteristics. The measurement instrument may influence an individual's response to items on a self-report questionnaire. Specifically, an individual may be influenced in such a way that s/he may behave or respond in a way that is different than s/he naturally would. For example, if an individual knew that s/he was being observed, s/he may act or respond in a different way than s/he would outside of the research context. If this was the case, then the person would be "reacting" to the research measure.

In the process of completing an item on a self-report questionnaire, Tourangeau and Rasinski (1988) identified four stages that a participant will experience in the inquiry-response of a particular item: 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. The authors concluded that the stages at the beginning of this process could be prone to measurement reactivity. Reactivity can be broken down into three problem areas: within measure context effects, meaning clarification, and self-referencing (Knowles & Byers, 1996).

Within measure context effects suggest that subsequent responses to items can be influenced by the individuals' responses to previous items. Specifically, Knowles (1988) found that an item's serial position rather than the diversity of the question was a source of influence on an individuals' response. Thus an individual's response to items on a self-report questionnaire may be influenced by the item's serial position in addition to the person's actual state.

The subjective meaning of an item can also influence an individuals' response. Research has shown that differences in respondent answers can reflect the perceived meaning of the question more than the actual state of the individual (Crutchfield & Gordon, 1947). Furthermore, items that invoke spontaneous, effortless implicit meanings can influence an individual's response (Uleman, 1987). Finally, an individual's interpretation of the meaning of items at the beginning of a test may influence the way s/he interprets the meaning of items later on in a test (Bargh & Pratto, 1986).

Items on self-report questionnaires that ask respondents to relate the content of the item to their self-concept can be prone to the self-referencing error. Essentially the process of generating a response to a particular item related to the self-concept will activate information related to self-referential material. Bargh and Pratto (1986) state

that once the self-concept has been activated it may prime other aspects of self-evaluation. Thus the activation of the self-concept and subsequent activation of other aspects of self-evaluation may lead to more links, elaborations, and assimilation of the concepts tapped by the items on the questionnaire (Burnkrant & Unnava, 1989). This may lead to greater polarization and more consistency among subsequent items on a questionnaire. To reduce participant reactivity, the method used in a study should be as open-ended as possible. In addition, the method should attempt to not invoke other processes within the individual beyond the capture and report of the experience (Hurlburt, Heavey & Seibert, 2006).

Ecological validity is one of the most difficult objectives to obtain for a self-report questionnaire. To obtain ecological validity a studies method, materials, and settings must approximate the real-life condition (Brewer, 2000). Typically, self-report questionnaires do not approximate the real-life conditions nor are they completed within the context of the individual's environment. Hurlburt (1997) concluded that the typical experiment couldn't obtain ecological validity because it attempts to provide one condition that is identical for all participants. Thus to maximize ecological validity, experimenters should conduct research in the participant's natural environment with as little contact as possible in the testing condition.

Another procedural measurement issue that must be considered when using retrospective self-report questionnaires is the demand characteristics of the study. Demand characteristics are cues given by the experimenter or the experimental context that indicate to the participant the desired outcome. The cues may be given consciously or unconsciously by the experimenter. Demand characteristics can be communicated via

age, sex, ethnicity, accent, appearance, social status, questioning, nonverbal behaviors, and personality traits of the experimenter(s). As a result of these cues, a participant may consciously or unconsciously be influenced to provide answers that echo the desired results of the experimenter rather than provide answers that best represent the participant. Weinberg, Wadsworth, and Baron's (1983) study on eyewitness memory report found that they were able to influence participant's responses by the type of questioning and nonverbal feedback given. Another study involving the influence of demand characteristics showed a video of a bicycle theft to participants. All participants saw the same video and then participated in one of three question conditions: unbiased questioning; requesting specific information without suggesting an answer; and questioning suggesting an answer (Cassel et al., 1996). Cassel et al reported the participants in the latter condition were influenced the most by the questioning. Thus, this body of research suggests the demand characteristics can influence the accuracy of reports.

Social desirability bias is also a concern with self-report studies. Social desirability bias is the tendency to present oneself in a way that will be viewed favorably by others. Sensitive topics (e.g., sex, health, psychological symptoms) can place participants in uncomfortable situations. When confronted with these topics, a participant may answer inaccurately or perhaps leave out details for ego-defense or impression management reasons (Fisher, 1993). Thus a researcher must be concerned about the potential effects of social desirability when using self-reports.

### *Methods that Minimize Measurement Errors*

As should now be clear, there are substantial issues that need to be considered when researching inner experience. In recent years a number of methods have been developed in the attempt to gain a fuller and more accurate understanding of inner experience. The Descriptive Experience Sampling method minimizes problems that are associated with memory and retrospective errors because this method focuses on inner experience phenomena at a particular moment in time marked by the onset of a beep and report within 24 hours. Other methods, such as the Experience Sampling Method (ESM; Larson & Csikszentmihalyi, 1983), cue participants with a beeper and ask them to complete a questionnaire. A full description of these and other inner experience sampling methods is provided below. These methods address concerns related to retrospective recall and methodological issues that cast doubt on more conventional methods.

#### *Articulated Thoughts in Simulated Situations*

Articulated Thoughts in Simulated Situations (ATSS; Davison, Robins, & Johnson, 1983) is a paradigm that allows the researcher to gain access to people's thoughts and feelings as they occur. ATSS is a highly structured, experimentally controlled situation that attempts to access cognitions as people actually experience them. The ATSS procedure was developed in an effort to reduce memory errors, censoring, and distortions that are common problems in retrospective self-reporting. The procedure uses an open-ended verbal response format. ATSS researchers have increased control in the experimental procedure as they are able to specify and manipulate situations as well as induce different emotional states. The procedure requires little cost and time by the experimenter to complete a study.

Typical ATSS experiments include a participant listening to an audio recording of a conversation for several segments. Davison, Vogel, and Coffman (1997) prefer an audio presentation to a video presentation because it allows participants to create their own images of simulated situations and it may permit greater personal relevance and meaningfulness. However, video presentations are allowed if the experimental procedure is highly structured. At any rate, the participant is required to listen to an audio recording for 15-25 seconds and after the recording has finished the participant is instructed to verbalize his/her thoughts as they occur for about 30 seconds. Participants are instructed to pretend that they are actually part of the scenario. Typical scenarios last for about 5-8 segments.

ATSS has shown good construct validity, with correlations ranging from .75 to .86 (Davison, Vogel, & Coffman 1997), face validity (Davison, Feldman, & Osborn, 1984), and concurrent validity (Davison, Feldman, & Osborn, 1984). Kashima and Davison (1989) investigated the test-retest reliability of ATSS by presenting participants with the same audio recording twice. It was found that thoughts varied more in surface similarity than they did in terms of functionality (e.g., irrational thinking). Kashima and Davison suggested this finding meant participants do not always verbalize everything on their minds; however, the functionality (schematic) of the participants can be attained by the method. Possible limitations of the method include the choice of strategy used by the experimenter to analyze the data, and the numerous possible coding schemes that can be used for each experiment (Davison, Vogel, & Coffman 1997). In addition, coding for a particular construct (e.g., irrational thinking, selective abstraction, maximization-



minimization) may require extensive hours of training before intercoder reliability can be achieved (Davison, Vogel, & Coffman 1997).

White, Davison, & Haaga (1992) explored cognitive bias in depression using ATSS. They played audio recordings of negative (rainy day at a barbeque), neutral, and positive situations to participants in an effort to explore cognitive bias. Participants included 15 depressed and 15 nondepressed psychiatric patients. Results of the study indicated that depressed participants showed more signs of cognitive bias in only the negative situation than did nondepressed psychiatric patients. These results indicate that situation-specific cognitive biases can be identified in relatively unstructured depressive cognitions. This means that not only do depressed participants endorse more negative cognitive bias response items; they also experience negative cognitive bias in their thoughts as they occur in real time. The authors suggested that these results provide support for the methodology as well as a feature of Beck's cognitive theory of depression.

#### *Think Aloud*

The think aloud method requires participants to speak out loud what they are thinking while engaged in a particular task assigned to them by the researcher. The participant's thought processes are tape recorded and subsequently used to determine thought content. Thoughts are collected without probes or questions, thus avoiding biased answers and potentially providing explanations of participants' behaviors (Meichenbaum & Cameron, 1981). The primary advantage of the method is data are collected immediately as the cognitions are occurring, minimizing retrospective memory biases.

The think aloud method was inspired by the need of cognitive and clinical psychologists to understand the role of thoughts in relation to affect and behavior (Davison, Vogel, & Coffman, 1997). The think aloud method has been used in a number of studies targeting depression. Studies have used participants who were induced to experience a negative mood (Bates, 2007). Other studies have investigated thought processes of individuals who were depressed (e.g., Barnhofer, de Jong-Meyer & Kleinpaß, 2002; Dodrill, 2005; Heidenreich, Junghanns-Royack, & Stangier, 2007). Dysphoria has also been studied using the thought processing method (Conway, Howell, & Giannopoulos, 1991; Mayo & Matsumi, 1996).

Bates (2007) investigated thought suppression related to negative intrusive thoughts. It is believed that thought suppression can cause heightened accessibility of unwanted negative thoughts during suppression, as well as paradoxical effects on post-suppression mood. People who exhibit this style of thinking are believed to be vulnerable to depression. Seventy-six nondepressed college participants were given phony negative feedback on a test that measured social competence. Participants were then assigned to one of four conditions: suppressed their reactions to feedback; expressed their reactions to feedback; concentrated on a previously described memory of positive feedback; or free-range discussion. Participants were required to verbalize their thoughts for five minutes in their respective condition and again without the constraints of the instructions. The suppression group experienced a larger number of test feedback thoughts following the end of the mental control condition than did the expressive or control groups. The author suggested the results demonstrated post-suppression intrusions of unwanted thoughts about a personally relevant negative event. The results

supported previous research findings that show suppression creates a link between unwanted thoughts and mood context, thus demonstrating that post suppression thought intrusions are associated with depressive affect (Wenzlaff, Wegner, & Klein, 1991).

Dodrill (2005) investigated the effect of verbal disclosure of feelings and emotions on recovery from dysphoric mood. One hundred and eighty-seven undergraduate participants who had recently experienced a stressful event took part in the study. Half of the participants were classified as mildly depressed and the other half of the participants classified as nondepressed according to the BDI-II. Participants were placed in one of three audio taped conditions: reflect on deepest feelings and thoughts related to the event; simply think aloud; and discuss a recent news event. Participants were required to take part in this procedure once per week for 20 minutes over three consecutive weeks. In addition, participants filled out questionnaires related to mood outcome, ruminative response style, and dysfunctional attitudes. Participants experienced a decrease in dysphoric mood in two of the three conditions namely, reflect on deepest feelings and thoughts related to the event and simply think aloud. Dysphoric participants scored higher than nondysphorics on ruminative responses, however, dysphorics also scored higher on emotional processing suggesting that ruminative tendencies do not impair productive emotional processing. These results did not lend support to rumination theory. However, ruminative tendencies were robust among dysphorics.

Conway, Howell, and Giannopoulos (1991) investigated the suppression of unwanted thoughts in dysphoric participants. Twenty-one dysphoric and 21 nondysphoric participants according to the BDI-short form took part in the study. In study each participant was assigned to one of two conditions: success feedback on a test

or failure feedback on a test. Following the feedback session, participants were specifically asked not to think about the feedback they received while participating in a five-minute think aloud procedure. Compared to non-dysphoric participants, the dysphoric group had more thoughts about failure and fewer thoughts about success. During the final minute of the procedure, dysphoric participants in both feedback conditions had more intrusions of failure in their thoughts. In study two, 31 depressed and 28 nondepressed participants were asked not to think of the neutral target - white bears. Dysphoric participants showed a similar thought pattern as evinced in study one, where they experienced a higher degree of intrusion of the target (white bears) that they were specifically asked to avoid thinking about. The authors concluded that dysphoric participants demonstrated evidence for the mood-congruence hypothesis where they were less successful at suppressing thoughts of any kind. This study also lends support to the cognitive-effort hypothesis, which suggests that during the later stages of a suppression period, dysphoric participants have reduced cognitive effort.

Mayo and Matsumi (1996) investigated self-statements generated by dysphoric and nondysphoric participants during an interpersonal problem-solving task. Thirteen dysphoric and 15 nondysphoric participants were shown a three-minute videotape of an interpersonal problem (relationship breakup). Participants were told to identify with the same-sex character and to think aloud as they generated solutions to the conflict. Participants' answers were coded in five categories: task facilitating, task inhibiting, emotion-focused, problem-focused, and periods of silence. Contrary to dysphoric participants' belief that they would generate fewer solutions than nondysphoric participants, they were able to generate as many effective solutions as nondysphoric

participants. Dysphoric participants evidenced fewer problem-focused statements and more emotion-focused statements. The socially coded score of solution effectiveness correlated negatively with the frequencies of emotion-focused self-statements. This last finding supports Beck's view that negative thoughts of people who are depressed can hinder active searching of problem-solving alternatives.

Barnhofer, de Jong-Meyer, and Kleinpaß (2002) explored whether depressed participants evidenced overgeneral autobiographical memories. Overgeneral autobiographical memories were operationally defined as statements that referred to a generic summary of events. Fifteen depressed and 15 nondepressed participants took part in the study. Participants were asked to listen to cue words (e.g., angry, happy, safe) and then recall an autobiographical memory. Participants then verbalized everything that came to mind. Verbal descriptions were coded as specific (referring to a particular day or location), categoric (overgeneral – series of repeated events) or extended (a memory for an extended time frame). Depressed participants evidenced fewer specific memories and more categoric memories. There was no difference between the groups regarding the numbers of extended memories recalled. The authors took these results as suggesting that depressed participants produced more sequences of consecutive categoric memories than specific memories. Thus depressed participants exhibited an overgeneralizing retrieval style when cued to recall autobiographical memories. This process resembles ruminative processes in that it reflects a recurrent focusing on self-descriptions.

Heidenreich, Junghanns-Royack, and Stangier (2007) also examined overgeneral autobiographical memory in depressed participants. Participants in the study included 18 depressed, 18 social phobics, and 18 healthy controls. In order to meet criteria for

inclusion into the depressed group a participant had to meet a depression diagnosis according to the Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID; First, Spitzer, Gibbon, & Williams 2002) and have a score of at least 18 on the BDI. Participants listened to cue words (e.g., happy, sorry, angry) and were instructed to verbalize their thoughts. In addition, participants completed a visual analog scale measuring the participant's perceived difficulty for each testing situation and experienced strain or arousal, respectively, during each task. In contrast to the results of Barnhofer, de Jong-Meyer, and Kleinpaß (2002) and other studies (Kuyken & Dalgleish, 1995; Williams & Scott, 1988) that have found overgeneralization in autobiographical memory of depressed participants, this study did not find any evidence of overgeneral autobiographical memory in depressed participants.

The data generated by various studies using the think aloud method provide informative and important insights about the thoughts and related affect of depressed individuals. The method's immediate focus on thoughts as they occur is one of the method's most notable advantages as it minimizes memory errors based on retrospective recall. However, the think aloud method lacks ecological validity and may be vulnerable to limitations such as reactivity and incomplete reporting (Genest & Turk, 1981). The think aloud method is conducted in a laboratory which questions the method's ecological validity and generalizability. Given that the method only focuses on verbal reports, it may force participants to ignore or under-report other forms of inner experience such as feelings, sensations, or images that are difficult to convey verbally. For reasons related to social desirability, participants may be reluctant to verbalize thoughts that are unrelated

to the assigned task or inherently personal thoughts that may arise when the participant is engaged in the task. Such limitations are problematic and difficult to circumvent.

### *Thought Sampling*

Thought sampling is another method of research that attempts to gain access into participants' inner experience. The goal of thought sampling is to quantify characteristics or aspects of thoughts (Hurlburt, 1997). Thought sampling researchers usually provide a beeper to the participant. The beeper will beep at random intervals. Following a beep, the participant rates his/her thought content on a series of Likert scales. Thought sampling minimizes some of the issues involved in retrospective recall by the immediacy of reports and unpredictability of when a beep will take place. There is a scarcity of research applying the thought sampling method to depressed participants.

Josephson, Rose, and Singer (1999) used thought sampling to assess the effect of mood on spontaneous cognition with depressed and nondepressed participants. Participants completed the BDI and were assigned to one of two mood induction conditions: sad and neutral video clips. Participants verbalized their thoughts after they were randomly beeped during a 15-minute period. The data showed a correlation between participants' mood and thought content in both conditions. Additionally, there was a significant correlation between thought content and the BDI. Depressed participants were found to have more overall negative thought content than nondepressed participants.

### *Ecological Momentary Assessment*

Ecological Momentary Assessment (EMA) is a sampling strategy that was created for the purpose of describing a person or a process (Shiffman & Stone, 1998). EMA is

noteworthy for its precision in collecting empirical data on subjective experiences (Stone, Shiffman, & deVries, 1999). EMA studies employ a variety of sampling strategies to collect multiple momentary assessments. Sampling strategies can include time, event, and signal contingent prompting. If the experimenter chooses to use the time contingent strategy, a participant will provide data at fixed, predetermined intervals (e.g., every six hours, on a daily basis at 10 am, etc.). Event contingent protocols require a participant to provide data at every occurrence of a specified target or trigger event. The target or trigger events (e.g., sadness, fatigue, phone call, etc.) are established prior to the study by the experimenter. The signal contingent sampling strategy requires participants to provide data at every moment that a random signaling device (pager, wrist watch, palm top computer) prompts them. When the participant is signaled (event, time, or signal) s/he will fill out a self-report measure or record a directly measured physiological phenomenon (e.g., heart rate, blood pressure; Shiffman, 2000). Typically, participants will use a handheld computer to record their data. The benefits of the handheld computers are ease of use and detection of fake diary entries. Furthermore, handheld computers can minimize participant's errors involving skipping questions or providing answers that are ambiguous. Handheld computers may minimize demand characteristics and social desirability because of the lack of intrusiveness that a participant may experience in an interview (Bendtsen & Timpka, 1999). EMA has been used with various populations to study behavioral (e.g., smoking, alcohol drinking patterns), physiological (e.g., blood pressure, cardiovascular responses) and psychological (e.g., anxiety, drug dependence) phenomena.



Biller (2005) used EMA to identify depressed participants' patterns of mood, thought, and socialization while undergoing psychotherapy. Thirty-two depressed and 30 undergraduate psychology students participated in the study. The depressed participants were divided into two groups consisting of 12 and 20 participants. Three participants out of the group of 12 recorded their cognitions and mood twice a day for six weeks via EMA. The remaining nine participants dropped out of the study for reasons consisting of termination of psychotherapy, not completing the study requirements, therapist request, and software problems. The three participants rated 30 statements on a Likert scale when signaled. Additionally, the three participants completed a BDI-II three times over the six-week period. The two remaining groups consisting of 20 depressed and 30 controls completed a BDI-II and the same 30 statements required of the three depressed participants one time. A decrease in negative affect was not found over the course of the study for the depressed participants. In addition, no common patterns emerged between the depressed participants' responses to positive and negative affect questions. The author concluded that EMA could help individualize treatments by identifying patterns of behaviors that would not otherwise be discussed in traditional psychotherapy.

The EMA method has limitations. EMA studies employ the use of palm top computers to increase the ease of data collection. However, the use of palm top computers requires a substantially higher level of financial commitment as well as technological knowledge on behalf of the researcher (Stone, Shiffman, & deVries, 1999). Although, palm top computers provide time stamps as when the participants recorded their experience, which improves timeliness in reporting, studies have found that a substantial portion of participants do not provide timely reports. For instance, Farchaus

and Corte (2003) found that 55% of EMA study participants did not record their experience in a timely manner, 15% or more admitted to recording data within 2 hours of the signal. Such delays raise questions about the accuracy and validity of data obtained using the EMA method as even minor delays could lead to an over or under estimation of the frequency of target events (Friedman & deWinstanley, 1998).

EMA often employs a repeated measures design, which generates a large quantity of data covering a good portion of the participant's daily life. However, the repeated-measures design can be burdensome for the researcher as well as the participant. EMA participants are typically required to spend a large amount of time training in the task of self-monitoring after which they are asked to record data several times, daily for the entire length of the study (Stone & Shiffman, 1994). Such time demands can lead to problems with attrition and selection bias (Stone, Shiffman, & Devries, 1999).

### *Experience Sampling Method*

The Experience Sampling Method (ESM; Larson & Csikszentmihalyi, 1983) was designed to capture systematic daily events and experiences in an individual's life. ESM can be considered an attempt to develop a quantitative approach to introspection. Participants are signaled by a wristwatch alarm or a pager to complete self-assessments in their natural settings. Self-assessments address phenomena related to cognitions, emotions, symptoms, motivation, and activities. In addition, participants usually describe their physical and social context. The pager is designed to go off during semi-random intervals of approximately 90 minutes. Typically an ESM study requires a participant to respond to 10 beeps per day over the course of one-week. Following data collection, statistical analyses are performed to help interpret the data. The goal of ESM is to gain

an understanding of the participant's internal state and external behavior. ESM is able to reveal unique information about the mechanisms of thoughts and behaviors that are often difficult to obtain using standard psychological methods (Klinger & Kroll-Mensing, 1995).

Quite a few studies have employed ESM with depressed participants (Kraan et al., 1992; Merrick, 1992; Mokros, 1993; Barge-Schaapveld, Nicholson, & Berkof, 1999; Myin-Germeys et al., 2003; Peeters, Nicholson, & Berkhof, 2003; Peeters, Nicholson, Berkhof, & Delespaul, 2003). Kraan et al. (1992) investigated the usefulness of the ESM procedure as a supplement to other diagnostic criteria (e.g., DSM-III-R) in distinguishing depressives from remitted depressives and nondepressed individuals. Sixteen currently depressed, six remitted depressives, and four nondepressed participants completed ESM and a SCL-90. Participants filled out Likert-scaled items and open-ended questions for six consecutive days, 10 times per day upon hearing a signal emitted by a pager. Likert-scaled items consisted of symptoms associated with major depression (e.g., tired, lonely, down, empty) as well as items indicating positive mood (e.g., energetic, satisfied, cheerful, secure). A panel of clinical psychologists chose items that best represented depression from the Zung Depression Scale, BDI, Hamilton Depression Rating Scale, Plutchik-van Praag's Depression Inventory, and Carrol Scale. The depression, anxiety, and somatization dimensions of the SCL-90 significantly correlated with the mean negative mood (depression) factor of the ESM procedure, indicating convergent validity. Depressed (current and remitted) participants were found to have a significantly higher mean score of negative mood compared to nondepressed. However, the negative mood factor was unable to differentiate currently and remitted depressed participants. Upon

further examination, the authors determined that the positive mood factor was able to differentiate the two depressed groups. The authors concluded that depressive patients are characterized best by a decrease in positive mood rather than an increase in negative mood.

Merrick (1992) investigated the everyday experiences of seven currently depressed (CD), seven previously depressed (PD), and 14 nondepressed (ND) adolescents. Participants were beeped eight times per day and filled out Likert-scaled items that were specific to dysphonic mood (sad, lonely, grouchy, angry, bored, and pleasure). The author looked for differences in the experience of the items between groups on three different axes: frequency, intensity, and duration. CD experienced more sadness, loneliness, boredom, and anhedonia than ND. Intensity of dysphoric mood was highest in the CD group, while PD reported the least mood intensity when experiencing dysphoric symptoms. Environmentally, CD spent much of their free time at home (often in their living room) and spent little time in public places compared to the other groups. Furthermore, CD spent little time participating in productive activities such as schoolwork or working a job. Socially, CD spent significantly more time alone than the other groups. Of the 239 moments collected from the CD group, not one moment involved the CD participant spending time with only one member of the opposite sex. In addition, only 4% of the CD moments were spent with more than one member of the opposite sex.

Mokros (1993) explored the difference between single-time-point clinician-based judgments and multiple-time-point self-reports for three specific symptoms of depression (sadness, irritability, and anhedonia). Mokros hypothesized the role of communication in

a major depressive episode diagnosis cannot be limited to the study of interpersonal interactions alone. Seven depressed and 14 healthy adolescents were signaled eight times on seven consecutive days to complete the Random Activities Survey. In addition, participants noted time of day, physical location, whom they were with, and what they were doing at each signaled moment. As part of the study, participants were interviewed prior and immediately after completion of the study by a clinician. Depressed participants reported more sadness than the control participants during the clinical interview; however during ESM, both groups showed similar rates of sadness. More than half of the depressed participants (four out of seven) experienced less irritability than what was predicted via the clinical interview. Furthermore, two depressed participants judged to be pervasively anhedonic by the clinical interview did not show any evidence of anhedonia in their ESM ratings.

Barge-Schaapveld, Nicolson, and Berkof (1999) compared the effects of mood states, physical complaints, and activity satisfaction to a momentary measure of quality of life (mQoL) in depressed and nondepressed participants. Sixty-three depressed and 22 nondepressed participants completed the mQoL self-report form following each signal, 10 times per day for six consecutive days. The mQoL self-report form assessed current mood, physical complaints, and enjoyment of activity on seven-point Likert scales. Following completion of ESM, participants filled out retrospective measures assessing global quality of life, mood, physical complaints, enjoyment of daily activities, and depressive symptoms. Depressed participants exhibited lower levels of mQoL, positive mood, and enjoyment of activity, higher negative mood, and more frequent and severe complaints than nondepressed participants. Similar to Merrick (1992), depressed

participants were less likely to engage in activities or working at a job than nondepressed participants. Depressed participants were found to have more variability in their mQoL than nondepressed participants. This finding was supported in Gunter (2008) where depressed participants exhibited more variability in positive and negative moments than nondepressed participants. These findings led Barge-Schaapveld, Nicolson, and Berkof to conclude that mQoL can be useful in determining the impact of depression on daily functioning and well-being.

Myin-Germeys et al., (2003) examined depressed participants' emotional reactivity to daily life stressors. Forty-six depressed participants, 42 suffering from non-affective psychosis, 49 healthy controls, and 38 bipolar participants completed a self-assessment form 10 times per day for six consecutive days. The self-assessment form was made up of seven-point Likert scaled items assessing participants' thoughts, current context, appraisals of the current situation, and mood. Depressed participants exhibited significantly higher negative affect and lower positive affect than all other groups. With regard to emotional reactivity, bipolar participants evidenced a decrease in positive affect in response to stress while depressed participants experienced a significantly larger increase in negative affect in response to stress compared to controls.

Peeters, Nicholson, Berkhof, Delespaul, and deVries (2003) investigated the effects of daily events on the mood of depressed participants. The authors hypothesized that severity of depressed episodes would influence mood reactivity to daily events. In addition, a current episode of depression and a history of previous episodes of major depression would decrease reactivity in negative affect and positive affect with regards to positive events as well as increase reactivity of both mood states to negative events.

Forty-seven depressed and 39 healthy participants completed self-reports of mood (e.g., irritated, guilty, happy) and events, 10 times per day for six consecutive days. All mood and event items were rated on seven-point Likert scales. Participants were requested to describe at the moment of each beep any positive and/or negative event(s) that may have occurred since the prior beep and to rate the event(s) on the same Likert scales.

Following participant completion of ESM, independent raters rated positive events on the dimensions of pleasantness, importance, and stress and negative events on the dimensions of unpleasantness, importance, and stress. Depressed participants reported fewer positive events than nondepressed participants; however, the reported number of negative events did not differ between groups. The experience of negative affect in response to negative events lasted longer in depressed participants.

Recent research examining abnormal cortisol levels in depressed individuals purports 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) explored whether there is a difference in cortisol levels in response to negative and positive daily events among depressed and nondepressed participants. Forty-seven depressed and 39 nondepressed participants filled out self-report questionnaires of mood and events while simultaneously providing saliva samples 10 times per day for six consecutive days. The authors examined the influence of clinical characteristics, mood changes, and gender differences in cortisol responses to events. In response to a negative event, depressed participants showed no changes in cortisol levels, whereas nondepressed participants experienced increases in cortisol levels. When facing a negative event, depressed women showed more change in cortisol levels than depressed men. Depressed

participants with a family history of mood disorders displayed even smaller increases in cortisol levels when experiencing a negative event. Negative affect did not appear to be associated with cortisol levels in depressed participants. Positive events did not affect cortisol levels in either group. The results suggest that the hypothalamic-pituitary-adrenal axis of depressed individuals show blunted responses to negative daily events and mood changes.

ESM has been used primarily to study mood, quality of life, and the context of experience and has provided beneficial insights related to these topics. The ESM method has limitations. One of the major limitations of the ESM method is its use of a self-report questionnaire. It would be impossible to construct a questionnaire that contains items representing all possible forms of inner experience at a particular moment (Stone, Kessler, & Haythornthwaite, 1991). Hence, it is likely that participants are unable to report experiences or events that are not mentioned on the list. Repeated responding to the same questionnaire may sensitize participants to the type of events represented on the questionnaires, making participants more likely to report them. Additionally, participants are not consistent about reporting data in a timely fashion. The paper and pencil version of the Experience Sampling Form makes it difficult to ensure timely responding by the participant (Barrett & Barrett, 2001). Hormuth (1986) and Csikszentmihalyi and Larson (1984) found that approximately 80%-90% of participants admitted occasionally to responding as much as 18 minutes after the cued signal. Such delays could increase the chances of memory and retrospective errors. Using an electronic device such as a palm top computer increases the likelihood of timely reporting as it provides time stamps that



record whether the data was collected in a timely fashion (Barrett & Barrett, 2001), however, it does not ensure timely reporting.

### *Descriptive Experience Sampling*

Descriptive Experience Sampling (DES; Hurlburt, 1990, 1993) is a qualitative method used to develop high fidelity descriptions of inner experience. Participants collect inner experience data in their natural settings. Participants wear a beeper and are instructed to pay attention to whatever is in their awareness at the moment immediately prior to the beep. As soon as the participant notes what was in his or her inner experience, the participant jots down notes about the characteristics of their experience in a notebook. Typically, the participant will collect a certain number of moments (usually five or six beeps) and then take part in an intensive expositional interview within 24 hours of when the beeps are collected.

A trained DES investigator conducts the expositional interview, striving to gain an accurate understanding of the participant's experience while limiting presuppositions. At each interview, the participant is asked to describe the split-second experience immediately prior to the signal of the beep and to work together with the investigator to understand the details of the experience. Furthermore, the investigator works collaboratively with the participant to develop descriptions of the experience that capture the original experience as fully as possible. A participant can decline to discuss any moment of experience that they consider to be too private to talk about. Following sufficient exploration of the experience, the investigator summarizes the moment to the participant. If some details are missed or a discrepancy exists, then the interview will continue until satisfactory agreement about the experience has been reached.

Typically, a participant will require one sampling day to be trained in attending to and reporting thorough descriptions of each moment. Sampling with each participant will usually occur over three to eight sessions. Once a sufficient number of moments of experience have been collected, the investigator will attempt to identify salient characteristics of the participant.

Thus, DES is an idiographic procedure that attempts to characterize one individual's experience. DES can also be used to identify salient characteristics of participants who share a similar psychiatric diagnosis or other feature in common. To accomplish this, the investigator samples with a number of participants and creates idiographic profiles for each participant. These idiographic profiles are carefully inspected to determine if there are shared characteristics across participants. If an experience appears to be common among the group, the investigator can generate a nomothetic characterization of the group's inner experience.

DES and other sampling methodologies differ on several fronts. The participant's inner experience as it naturally occurs to them is the primary focus of DES. For instance, ESM is interested in other aspects of awareness such as social or environmental context, activities, or other characteristics of interest as the focus of investigation a priori. Furthermore, ESM requires participants to provide responses via a structured format, often requiring participants to answer items via Likert scales. Some research designs involving ESM do not actually investigate the participant's thinking, but rather measure the participant's mood, quality of life, and physical concerns. DES does not require participants to complete questionnaires at each moment; rather DES asks the participants to focus solely on the split second of experience that was ongoing when the beep

sounded. DES then employs an open-ended process to capture that experience whereby the participant takes unstructured notes about the experience and then participates in an unstructured expositional interview. Furthermore, DES does not require the participant to pay attention to their social, environment, or physical characteristics unless that is part of the inner experience for the participant at that moment. In addition, DES reports are analyzed qualitatively rather than quantitatively (Hurlburt, 1997).

DES has been applied to many psychiatric groups (e.g., bulimia, schizophrenia, aspergers syndrome, anxiety), however only a handful of studies have looked at the inner experience of those who suffer from depression (Hurlburt, 1993; Perlotto, 2001; Gunter, 2008). Of the few studies applied to depressed populations, the sample sizes have been relatively small.

Hurlburt (1993) explored the inner experience of three individuals suffering from various levels of depression and one individual who experienced hypomanic periods. Hurlburt reported five salient characteristics. The first observation made by Hurlburt was that as depressive symptoms increase, there is a decrease in the frequency of experiencing inner symbolization. In other words, as the depressed individuals became more depressed, they experienced less inner speech and inner seeing while simultaneously having an increase in experiences of unsymbolized thoughts. The second characteristic noted was that as depression increased; the individual experienced less clarity in their inner seeing. Participants reported very detailed inner seeing experiences when not depressed, suggesting that during depression they were experiencing cloudiness or that the inner perception process became unclear. The third observation was that depressed participants had difficulty differentiating perceptual from conceptual descriptions.

During the interview, participants reported inner seeing in their moment, however, when probed carefully, experiences tended to not be inner seeing at all. The fourth characteristic observed was the inconstancy of the perceiver, as the participant reported having distinctly different mental states associated with different thoughts. Hurlburt suggested that depressed individuals might not have a clear, stable platform from which to observe their own experiences. The fifth observation was that emotional processing was sometimes experienced outside of the participant's awareness. Participants frequently reported emotional processing in their body; however, they did not recognize these emotions in their awareness at the moment of the beep. Another interesting finding was that all depressed participants were able to recognize their affect was changing, but did not recognize their cognitions were also changing along with changes in their affect.

Perlotto (2001) explored the inner experience of three depressed participants and a control group. Participants completed DES, gathering six beeps per day for approximately five days. The depressed group frequently experienced feelings, sensory awareness, and unsymbolized thinking. However, those experiences did not occur significantly more frequently than in the control group. The control group frequently experienced feelings, sensory awareness, and images. The depressed group reported more multiple experiences per beep and a higher percentage of feelings per sample compared to the control group. The feelings moments the depressed group had a much greater ratio of negative to positive feelings (4:1 ratio) compared to the control group (1:1 ratio).

Gunter (2008) explored the inner experience of six depressed and four nondepressed participants. Participants completed a SCID interview, filled out

questionnaires (Center for Epidemiological Studies-Depression, BDI-II, Cognitive Triad Inventory, Dysfunctional Attitudes Scale, and Automatic Thoughts Questionnaire), and completed DES over four sampling days. Independent raters examined each beep summary for depressive content, anxiety content, and valence and rated the moment on Likert scales. Depressed participants experienced less frequent inner speech and more feelings than nondepressed participants. The ratings indicated depressed participants had more depressive content, anxiety content, and overall negative experiences within their sampled moments than did the control participants. Salient characteristics of the depressed participants' sampled moments appeared to be depressive content, depressive feelings, anxiety content, anxiety feelings, a propensity for overall negative experiences, and more highs and lows in everyday experiences.

#### *Methodological Advantages of DES*

The methods reviewed in the above section address some of the methodological concerns relevant to understanding inner experience. DES's conservative and stringent approach to obtaining faithful accounts of an individual's inner experience helps minimize many of the common methodological concerns surrounding inner experience sampling, such as errors in retrospective self-reports. DES is target specific, in that it requires the participant to attend to a specific moment in time marked by the onset of the beeper. This target specificity reduces errors associated with semantic memory. Furthermore, DES minimizes errors associated with memory capacity as it is interested in brief moments (one second or less) of experience. DES asks participants to record their inner experience immediately following its occurrence, which minimizes the loss of

information or adulterations due to state dependent recall. During the expositional interview participants are asked to provide a full account of their momentary experience to the interviewer. However, in order to reduce reactivity, participants are expressly discouraged from reaching beyond the captured experience and inferring what their experience meant or exploring reasons for why they may have experienced a phenomenon. The interviewer cautiously asks questions that helps the subject to authentically reveal his/her inner experience and avoids asking questions that are leading or laced with the interviewer's presuppositions about how a phenomenon ought to occur. Lastly, DES is an ecologically valid method where the participants collect momentary inner experiences in their natural environment while going about their normal day.

### *Cognitive Theories of Depression*

In the last half-century, numerous models have been proposed to explain the onset and maintenance of depressive symptoms. Proposed models include the catecholamine (Schildkraut, 1965), behavioral (Lewinsohn, 1974), self-control (Rehm, 1977), ruminative response (Nolen-Hoeksema, 1991), cognitive (Beck, 1967), and helplessness-hopelessness (Seligman, 1975; Abramson et al., 1989) models. Since introspective-sampling research primarily deals with inner life, the cognitive and helplessness-hopelessness models of depression appear to have the most relevance. Cognitive theories of depression describe the nature of cognitive experiences which accompany and potentially contribute to depression. Below I review the cognitive and helplessness-hopelessness models of depression, which focus on the role of cognition in the etiology,

maintenance, and treatment of depression. Following each models description I will review relevant research that utilizes sampling methodologies.

### *Beck's Cognitive Theory of Depression*

According to Beck (1967), depressive symptoms can be triggered by a negative event. During the encoding of stimuli, an individual's brain automatically activates a schema that helps process the information quickly. If the individual's brain automatically activates a maladaptive schema, then the person may encode the negative event in a dysfunctional way. A dysfunctional interpretation of a negative event can lead the individual to inappropriately assign themes of inadequacy, loss, blame, failure, and worthlessness to themselves. As these negative themes are experienced within a person's cognitions, it can lead the person to feel, behave, and think in ways that are consistent with the DSM-IV-TR's diagnosis of a major depressive episode. Thus, depression is activated and maintained by way of dysfunctional thinking patterns.

Beck theorized that there are four different cognitive components that are susceptible to dysfunctional thinking. The four components that comprise Beck's theory are depressive self-schemas, distortions and biases, negative automatic thoughts, and cognitive triad of thinking. Each component will be described in turn.

A schema is a mental model that an individual has developed in order to organize and process experiences efficiently. Schemas are developed out of past experiences and beliefs related to a specific stimulus. Once a specific stimulus has occurred, an individual's schema will set off automatic scripts and behavioral action sequences that allow him/her to respond quickly. These scripts and behavior sequences provide the individual with information related to his/her attributes and abilities. Typically,

individuals will develop schemas for events that are experienced by the majority of society. However, an individual also develops schemas that are unique to him/herself; these are called self-schemas.

Self-schemas are self-focused and distinctive to the individual. They are regarded as hypothetical constructs that can account for repetitive patterns in an individual's thought content. Specifically, when the self-schema is activated by a particular stimulus, the schema abstracts and shapes the raw information into thoughts or cognitions. Typically the content of the schemas take the form of generalizations that represent the individual's attitudes, goals, values, and ideas.

Self-schemas start to develop in early childhood (Millon & Blaney, 1999). Similar to personality, once a particular self-schema has developed, it becomes embedded in the individual and is resistant to change (Beck, 1964). In psychopathology, the orderly matching of stimulus and schema fails because of the intrusion of hyperactive idiosyncratic schemas (Beck, 1964). As a result of the increased meaningfulness placed on a maladaptive schema, the maladaptive schema tends to take over for the more appropriate schema. This results in interpretations of events that deviate from reality (Beck, 1964).

Depressed individuals typically exhibit rigid patterns of thinking and cognitive distortions. According to Beck, as depression develops, the dominance of idiosyncratic schemas is attributed to the increase in degree and frequency of cognitive distortions. As depression progresses, negative schemas become more active and become evoked by information that may be incongruent with them. The activation happens because unlike most people's interpretation of a situation, negative schemas will extract information



from the environment that is congruent with them and mold it to fit the negative schema. All types of individuals are susceptible to developing a depressive schema; however, this schematic formation is more characteristic of depressed individuals.

Social stressors are the typical stimuli that activate and lead to the development of depressive self-schemas (Beck, 1967). As more and more depressive self-schemas are activated, the individual will experience more depressive symptomatology. The presence of depressive self-schemas has been widely tested in research (Allen et al., 1996).

Embedded in depressive self-schemas are what Beck called “dysfunctional attitudes” (Beck, 1967). Dysfunctional attitudes are the term used to describe the distorted patterns of thinking that contributes to depressive self-schemas. Dysfunctional attitudes occur in the cognitive processing of a negative stimulus. People experiencing depressive symptoms are prone to a variety of dysfunctional attitudes. Beck identified four general categories of dysfunctional attitudes: arbitrary inference, selective abstraction, overgeneralization, and minimization and magnification (Beck, 1964).

Arbitrary inference occurs when an individual draws negative conclusions about an event without support for those inferences. Selective abstraction occurs when an individual focuses on the negative in a situation while disregarding the rest of the context. Another dysfunctional attitude identified by Beck is overgeneralization, which is the tendency to assume that failure at one task predisposes one to fail at all related/similar tasks encountered. Minimizing events is the tendency to experience little accomplishment following completion of a difficult task and magnifying events occurs when an individual experiences a minor setback, yet considers it a major failure.

As these dysfunctional attitudes overtake an individual's processing of information a systematic bias occurs in the content of the individual's cognitions. Beck theorized that depressed individuals generate excessive negative cognitions as a response to a negative event. This overactive cognitive tendency is referred to as negative automatic thoughts. Negative automatic thoughts are the negative beliefs and meanings assigned to events and usually represent thoughts about worthlessness or hopelessness, or general self-derogatory beliefs or reenactments of past failures or stressful situations.

Typically negative automatic thoughts take the form of overly pessimistic views of oneself, one's world, and one's future, which is referred to as the cognitive triad of thinking. The cognitive triad of thinking theory postulates that a depressed person will interpret stimuli regarding 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 frequently feel deprived or defeated in their experiences, feel worthless, and often see their future as hopeless.

As the four components of Beck's cognitive theory of depression are activated a person will experience sadness or other symptoms of depression. Once a pattern of depressive interpretations overtakes the individual's cognitions for the majority of situations they encounter, it will lead to the activation and maintenance of depressive symptomatology.

#### *Sampling Research Exploring Beck's Cognitive Theory of Depression*

To date, three sampling studies have explored components of Beck's Cognitive Theory of Depression. Cavenagh (2003) explored the presence of the cognitive triad in

depressed participants experiences via DES. Husky, Mazure, Maciejewski, and Swendsen (2007) explored the sociotropic/autonomic subtype of Beck's theory using ESM. Gunter (2008) used DES to identify whether the components of Beck's theory were evidenced in moment-to-moment experiences of depressed individuals.

Cavenagh (2003) recruited three participants who had a very high negative attributional style and three participants who had a non-negative attributional style. Participants completed four days of DES. Two of the six participants were determined to be at high risk for depression (one from each group). Individual beeps were coded on a Likert scale for evidence of the cognitive triad (an overly pessimistic view of oneself, one's world, and one's future). The depressed participants evidenced more moment-to-moment experiences of the cognitive triad than did the nondepressed participants. Cavenagh suggested that Beck's cognitive triad appears more frequently in the experiences of depressed participants.

Husky, Mazure, Maciejewski, and Swendsen (2007) used ESM to explore depressed mood in sociotropic and autonomic individuals. The authors 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. The study consisted of 179 participants who filled out self-report questionnaires regarding mood and cognitive vulnerability (attributional style and sociotropy-autonomy). Participants were required to complete the ESM over seven consecutive days. Swendsen reported that sociotropy was an indirect determinant of depressed mood and appeared to support causal mediation and

specificity. Though the sample as a whole experienced more depressed mood following a negative event, the relationship appeared to be much stronger with sociotropic individuals. Sociotropy was found to have an impact on a participant's mood following a negative social event. However, autonomy did not directly affect a participant's mood following negative-achievement related events.

Gunter (2008) examined the cognitive theory of depression using DES. Six depressed and four nondepressed undergraduates participated in the study. Each participant completed questionnaires consistent with Beck's theory (BDI-II, Cognitive Triad Inventory, Dysfunctional Attitudes Scale, and Automatic Thoughts Questionnaire) and four days of DES. Following the participants' completion of the study, sampled moments were rated on Likert scales by independent raters for experiences of depressive content, the cognitive triad, dysfunctional attitudes, and automatic thoughts. The ratings indicated depressed participants had more frequent experiences of depressive content, the cognitive triad, dysfunctional attitudes, and automatic thoughts within their sampled moments than did the control participants. However, only the depression construct showed a statistically significant difference between the groups. The other constructs showed a large effect size in the expected direction. Participants' overall scores on the questionnaires correlated with the corresponding rated construct on depressive content, the cognitive triad, and automatic thoughts. However, further analyses suggested that these constructs were highly intercorrelated. This study suggests that individual components of Beck's theory can be found in moment-to-moment experiences but the components may not be distinct.

### *Helplessness-Hopelessness Theory of Depression*

The learned helplessness theory of depression (Seligman, 1975) states that people become depressed when they believe that they are no longer in control over reinforcements in their lives and that they are responsible for this lack of control.

Seligman derived his theory through animal experiments. Specifically, he administered unavoidable shocks to dogs and observed a steady decrease in escape and avoidant behavior over time. Furthermore the dogs exhibited more passivity, weight loss, and a decrease in appetite. These findings were seen as a parallel to the symptoms that precipitate depression.

The theory was revised in 1978 to focus on an individual's attribution of responsibility for a negative event as the primary source in the development of depressive symptoms (Abramson, Seligman, & Teasdale, 1978). Specifically, depressive vulnerable individuals attribute internal, stable, global causes to negative outcomes and external, unstable, and specific causes to positive outcomes. In other words, following a failure, the depressive-vulnerable individual will take responsibility and assume the cause is general and persisting. After a successful outcome, the depressive-vulnerable individual will not take credit and assume that the outcome does not have any bearing on their behavior or for the future.

The theory was revised a third time by Abramson et al., (1989). Abramson et al., (1989) suggested that depression only resulted after an individual experienced a sense of hopelessness. This theory views both anxiety and depression as being characterized by helplessness, but only depression is characterized by hopelessness. The hopelessness attribution style cannot occur without first experiencing helplessness; therefore anxiety

symptoms are common within depression syndromes. Symptoms of anxiety are the initial mood reaction to a negative outcome and in turn can cause the individual to experience hopelessness if s/he views the event as stable and global. Furthermore, individuals with depressogenic attributional styles are more likely to attribute negative events to stable and global causes; therefore they are at increased risk to experience hopelessness depression.

#### *Sampling Research Exploring the Helplessness-Hopelessness Theory of Depression*

Five studies have explored components of the helplessness-hopelessness theory of depression utilizing sampling methodologies. Swendsen (1997) categorized 44 participants low in depressive and anxiety symptomatology into two groups consisting of low or high risk attributional styles for depression. Participants were signaled via a beeper five times a day for a one-week period. Following a signal the participant completed an experience sampling form made up of items assessing attribution styles, daily life events, and anxious and depressed moods. The participant's attributional (e.g., depressogenic) style predicted momentary causal attributions. Furthermore, a hopeless causal attribution for a minor negative event predicted changes in residual depressed mood. After the experience of a negative event, causal attributions of globality and stability explained the increase in depressed mood. Swendsen found a difference between anxiety and depressive symptoms regarding attribution styles which was consistent with the theory's assertion that negative outcome expectancy is unique to depression. However, Swendsen did not find support for the claim that helplessness expectancy consistently predicted anxiety. The results of this study provide support for the helplessness-hopelessness theory of depression.

Swendsen (1998) examined idiographic and cross-situational data in hopes of validating the helplessness-hopelessness theory. Ninety-one participants completed ESM five times per day for seven consecutive days. Attributional and perception of control styles were assessed via questionnaires. Questionnaires were made up of items assessing anxious and depressed moods, daily life events, and specific attributions made to those events. The author did not find a link between attributional and perception of control styles with regard to negative events predicting the onset of depressive symptoms. Attributional and perception of control styles predicted causal attributions and perceptions of control across the daily flow of environmental contexts. Specific causal attributions of negative events were more predictive of fluctuations in depressed mood than the individual's daily experience. A highly specific timeframe for testing theories of depression was suggested by Swendsen. Specifically, stable and global causal attributions were observed to have greatest influence on the individual immediately after the negative event. Typically, this attributional style subsequently influenced mood for up to six hours afterward.

Swendsen (2000) explored the cross-cultural validity of the helplessness-hopelessness theory of depression via ESM. Participants were 90 French people and 43 Americans. Participants were signaled five times per day for one-week to complete questionnaires. The questionnaires consisted of the Inventory of Small Life Events, attributional styles, and BDI. After completion of the questionnaire items participants evaluated the event that had the biggest impact on them. Participants rated this event on seven-point Likert scales regarding the event's stability, globality, and internality. Results indicated differences between cultures with regard to average severity of daily

negative events, depressed moods, and causal attributions. Specifically, French participants reported more negativity about daily negative events, but attributed fewer causal attributions to themselves compared to the Americans. Depression levels were not found to be different across cultures.

Cavenagh (2003) explored the experience of three individuals with negative attributional styles and three with non-negative attributional styles as determined by the Attributional Styles Questionnaire. Participants completed four days of DES. Their moments of experience were then coded for attributional style by the author. The author did not find any significant difference between the attributional styles reflected in the moments of experience between the two groups of participants.

Husky, Mazure, Maciejewski, and Swendsen (2007) 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. One hundred and seventy-nine participants completed self-report questionnaires regarding mood and cognitive vulnerability (attributional style and sociotropy-autonomy). Participants then took part in ESM over seven consecutive days. Attributional style was found to be an indirect determinant of depressed mood. Furthermore, attributional style supported causal mediation and specificity. Attributional style predicted the differing levels of specific attributions to the variety of negative events experienced in daily life. The moment-to-moment cognitions were able to explain the variance in depressed mood. The authors further explained that the helplessness-hopelessness theory of depression was able to explain a larger portion of variance in depressed mood overall than the cognitive theory of depression.



### *Present Study*

The present study employed Descriptive Experience Sampling (DES) to explore the inner experience of depressed individuals and a comparison group of nondepressed individuals. The inner experience of the depressed individuals also was examined to determine the extent to which it reflected or was consistent with cognitive theories of depression and the inner experience of the two groups was compared. The study involved three phases: Screening, Qualification, and Sampling. During the Screening Phase, approximately 226 university students were administered the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). Participants who scored high on the CES-D were asked to take part in the Qualification Phase. Similarly, participants who scored low on the CES-D were asked to take part in the Qualification Phase to identify nondepressed participants for a comparison group. During this phase, participants were administered the mood disorders module of the Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID). Participants who met criteria for a diagnosis of Major Depressive Disorder according to the SCID were asked to participate in the Sampling Phase. Likewise, participants who were identified as low in depressive symptomatology and did not meet criteria for a diagnosis of Major Depressive Disorder according to the SCID were asked to participate in the Sampling Phase. During the Sampling Phase of the study participants took part in DES. Participants were asked to collect six beeps per day over four sampling days. Within 24 hours of when the samples of inner experience were collected an expositional interview was conducted and the participants were asked to describe their inner experience at the moment of each beep and

to collaborate with the interviewer(s) to understand the details of each moment of inner experience. In addition participants completed the CES-D before each interview to assess changes in depressive symptoms. After each sampling interview, the interviewer prepared a written description of each moment of the participant's inner experience.

After data collection was complete, the investigators reviewed the written descriptions of the moments of inner experience to develop an approach for characterizing the moments of inner experience. The investigators decided to code each moment of inner experience. A set of codes was developed that included the five most common characteristics of inner experience based on prior DES studies (Heavey & Hurlburt, 2008; Hurlburt & Heavey, 2002), other common phenomena of experience encountered in prior DES studies of depressed individuals, and codes for experiential symptoms and constructs discussed in the broader literature on depression (e.g., depressed mood/sadness, fatigue, anxiety, Negative Cognitive Triad). A complete description of the codes used is presented in the Method section.

Gunter and Heavey coded each moment of experience for several of the participants and then reviewed the process, discussed disagreements and refined the codes. After this process of refining the codes, Gunter and Heavey independently coded each moment of experience for all of the participants. These codes were then reviewed to assess the reliability of the coding process. Disagreements were reviewed to develop a consensus coding of each moment of experience. The consensus codes for each moment were then analyzed to look at within group similarity and variability as well as between group differences. Similarly, self-report scores via the CES-D were compared with

relevant coding constructs to look at within group similarity and variability as well as between group differences.

## CHAPTER 3

### METHOD

This study consisted of three phases: a Screening Phase which identified people who had elevated levels of depressive symptoms and others who had minimal symptoms of depression; a Qualification Phase which determined if participants met DSM-IV-TR criteria for a major depressive episode or were free of depression and therefore could serve as a comparison group; and a Sampling Phase which explored the inner experience of individuals suffering from depression and a nondepressed comparison group.

#### *Screening Phase*

##### *Participants*

The participants in this phase were made up of 226 Spring 2009, University of Nevada, Las Vegas undergraduate *Introduction to Psychology* students. Participants were given psychology research participation credits.

##### *Instruments*

The demographic questionnaire contained the following items: name, address, email address, phone number, cell phone number, age, race, sex, marital status, education level, and employment status.

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was designed to screen for depressive symptoms as well as to assess change in symptom severity over time. It is a 20 item self-report questionnaire that takes about 10 minutes to complete. Participants read each item and determined the extent that the statement

described how they felt during the past week. Participants rated items on a Likert scale ranging from zero to three. Upon completion of the questionnaire, the participant total score ranged from zero to 60. Scores between 16 and 26 indicate mild depression and scores of 27 or more indicate major depression (Zich et al., 1990; Ensel, 1986) The internal consistency coefficient alpha of the CES-D has ranged from .85 to .90 (Radloff, 1977). Test-retest reliability for two and eight week periods was found to be between .51 and .67, respectively (Radloff, 1977). The CES-D has shown good convergent validity as it has correlated highly with other depression scales such as the Beck Depression Inventory and the Zung Depression Scale.

### *Procedure*

Researchers recruited participants by advertising the study in Psychology 101 classes at the University of Nevada Las Vegas. At the end of the students' class period the researcher provided a brief description of the study. Volunteers completed the informed consent, the demographic questionnaire and the CES-D in exchange for 0.5 psychology research credits.

### *Qualification Phase*

#### *Participants*

Undergraduate students with the highest and lowest scores on the CES-D were contacted to participate in the Qualification Phase. This phase continued until eighteen participants qualified and agreed to participate in the Sampling Phase. Thirty-three people were invited to participate in the Depressed sample. Two people declined to participate and seven people did not respond to a phone message or email left by the researcher. Of

the 24 participants who were interviewed for the Depressed group, ten qualified for the Sampling Phase of the study, and nine chose to participate. Twenty-three people were invited to participate in the Nondepressed sample. Three people declined to participate and eight people did not respond to a phone message or email left by the researcher. Of the 11 participants who were interviewed for the Nondepressed group, all eleven qualified for the Sampling Phase of the study, and nine chose to participate. Participants were given one hour of course research credit for their participation in the Qualification Phase.

### *Instrument*

The Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID; First, Spitzer, Gibbon, & Williams 2002) is a semi-structured diagnostic interview intended to help clinicians, researchers, and trainees make reliable DSM-IV-TR psychiatric diagnoses. The full-length version of the SCID can take between one to two hours to complete if the participant meets criteria for a psychiatric diagnosis. A nonpsychiatric participant may complete the interview within 30 to 90 minutes. Only the mood disorders module and brief psychotic screen of the SCID were administered; participants generally completed the interview within 30 to 45 minutes. Zanarini et al., (2000) has shown the SCID to be a reliable and valid measure for a diagnosis of Major Depressive Disorder. Specifically, correlation coefficients for interrater reliability were found to be .80 and test-retest reliability for a seven to 10 day period was .61.

### *Procedure*

Participants who met the screening criteria completed an informed consent form. The SCID was administered to each participant by either Jedidiah Gunter or Noelle

Lefforge, a fellow graduate student working in the DES lab. Following the SCID interview, participants were notified if they met inclusion criteria to take part in the Sampling Phase. Those who met inclusion criteria for either the Depressed or Nondepressed group were invited to participate in the Sampling Phase of the study.

### *Sampling Phase*

#### *Participants*

As measured by the SCID, nine undergraduate students who were suffering from major depression but not a psychotic disorder and nine undergraduate students who did not meet diagnostic criteria for any mood or psychotic disorder participated in the Sampling Phase. Each participant earned five psychology participation research credits.

The average age of the depressed participants was 20.78 years, with a range of 18 to 30. Six of the participants were female and three were male. Three of the participants were Asian, two Hispanic, one Caucasian, one biracial, one Chicana and one multiracial. The sample consisted of four freshman, two sophomores, two juniors, and one participant whose year in school was unknown. One of the participants had been married, one had been divorced, and seven had never been married. Two of the participants were employed part-time and one was employed full-time. Four of the participants had received therapy in the past. The average score on the CES-D during the Qualification Phase was 35. None of the depressed participants were taking psychiatric medications. The average time to complete sampling was 25.1 days with a range of 9 to 44 days.

The average age of the nondepressed participants was 20.10 years, with a range of 18 to 27. Five of the participants were female and four were male. Two of the

participants were Asian, one Hispanic, four Caucasian, and two Mexican. The sample consisted of three freshman, two sophomores, one senior and three participants whose year in school was unknown. One of the participants was married and eight had never been married. Four of the participants were employed full-time. One of the participants had received therapy in the past. The average score on the CES-D during the Qualification Phase was 2.13, with one missing entry. None of the nondepressed participants were taking psychiatric medications. The average time to complete sampling was 16.3 days with a range of 7 to 34 days. The difference between the groups for average time to complete sampling was not statistically significant,  $t(16) = 1.85, p = .08$ , but the effect size of the difference was large,  $d = .87$ .

#### *Equipment and Instruments*

A pocket-sized beeper and an earphone were provided to each participant. The beeper was programmed to emit a 700-Hz tone/beep at random intervals ranging from immediate to 60 minutes with a mean length of 30 minutes. This beep was heard through the provided earphone. Additionally, a pocket-sized notebook was provided to each participant. The notebook was used to jot down notes about his/her inner experience at beeped moments. The CES-D was used to measure ongoing depressive symptoms.

#### *Procedure*

Participants were notified immediately after the Qualification Phase if they met inclusion criteria for the Sampling Phase. Participants who met inclusion criteria were invited to meet with the investigator. The investigator explained the Sampling Phase of the study including possible benefits of participating, the procedure, and the required time commitment. If interested in completing the Sampling Phase, the participants were told



about the limits of confidentiality and their ability to terminate the study at any point.

After the investigator addressed any questions or concerns the participant had, the participant provided informed consent.

Following completion of the informed consent, participants were given instruction on the DES procedure including instructions on how to operate the beeper and wear the earphone. Specifically, instructions were provided on how to turn the beeper on and off, adjust the volume, and reset the beeper by pressing a button. Additionally, each participant was given a pocket-sized notebook and instructed to take notes on their inner experience after each beep. Participants were instructed to turn on the beeper as they went about their normal daily activities. They were asked to do this no more than twenty-four hours prior to the scheduled expositional interview. Following a beep, the participants were instructed to jot down notes in their notebook about their inner experience that was ongoing just as the beep began, which we call the moment of the beep. If a beep captured a moment that the participant did not want to share with the investigator, the participants were told they could decline discussion of that beep. Further, they were told that if there was any aspect of a beep they did not want to discuss, they should decline to discuss the entire beep so as to avoid incomplete descriptions of any moment. They were asked to repeat this process of the beep sounding and taking notes on their ongoing inner experience until they had collected six moments of inner experience. Once the instructions were completed and questions about the procedure answered, the investigator scheduled a time to meet at the Experience Sampling Lab for an expositional interview.

The 1-hour expositional interviews were conducted by Jedidiah Gunter or Noelle Lefforge, a fellow graduate student working in the DES lab. Four of the depressed participants and five of the nondepressed participants were interviewed by Jedidiah Gunter. Noelle Lefforge interviewed five depressed participants and four nondepressed participants. Christopher Heavey filled in when the primary investigator was unable to make an appointment and he also co-investigated in some of the interviews. These interviews were audiotaped or videotaped. During the expositional interview, the participants were instructed to provide a faithful description of their inner experience at the moment of beep. The interviewer asked questions to help the participant with this task. The participant and interviewer worked together as a team to apprehend the details of the participant's ongoing inner experience at each beep. Once all six beeps were discussed, the participant was asked to repeat the process of collecting six beeps and participating in an expositional interview within 24 hours of beep collection. In addition the participant completed the CES-D prior to each expositional interview to assess changes in depressive symptoms.

The primary interviewer wrote a summary of each moment of experience within a 24 hour period following the expositional interview. Descriptions of each moment included a brief description of the context followed by a description of the participant's ongoing inner experience. The primary interviewer reviewed the inner experience descriptions with Dr. Heavey. This procedure was repeated until each participant completed four expositional interviews for a total of approximately 24 sampled moments. The actual number of sampled moments across all participants was 412, 198 for the Depressed group and 214 for the Nondepressed group.

In typical DES studies, the first day of sampling is discarded as a training day. However, because of the exploratory nature of this study and the fact that the level of reported depressive symptomatology in the Depressed group declined substantially each day, it was decided to use the first day sampling results in this study.

After data collection was complete, Dr. Heavey and Gunter reviewed the momentary experiences of all participants in order to develop an approach for characterizing the moments of inner experience. It was determined that Gunter and Heavey would code each moment of inner experience. A set of operational definitions were developed for five different groups of phenomena or aspects of experience. The first group included the five most common phenomena of inner experience based on prior DES studies (Heavey & Hurlburt, 2008; Hurlburt & Heavey, 2002) and the coding instructions were based on the codebook developed by Hurlburt and Heavey (2006):

1. **Inner speech** - is the experience of speaking words in the person's own voice, with the same vocal characteristics (timbre; rate; inflection for commas, question marks, etc.; pauses; accents; stutters; etc.) as the person's own external speech, but with no external (real) noise. In its pure form, the experience of *inner speech* is identical to that of external speech except that the mouth does not move and no external production of sound is produced.
2. **Inner Seeing** - is the experience of seeing something that is known to be not actually present. In its pure form inner seeing has the same characteristics as seeing an external object: the center is in clearer focus, the focus or attention becomes less clear at the periphery; there is no distinct border or edge to the experience, and so on.

3. **Unsymbolized thinking** - is the experience of thinking some particular, definite thought without the awareness of that thought's being represented in words, images, or any other symbols.
4. **Feeling** - is an emotional experience, including sadness, happiness, anxiety, joy, fear, nervousness, anger, embarrassment, and so on.
5. **Sensory Awareness** - is a sensory or perceptual experience (itch, hotness, pressure, visual taking-in, hearing) that is itself a primary theme or focus for the subject. Such a *sensory awareness* may be bodily (itch, tingle, pain, pressure, hotness, coldness, shiver, stiffness, etc.) or external (noting the color of a flower, smelling gasoline, taking in the characteristics of a sunrise, hearing the scratching of the cat at the door, etc.)

The second group of codes included a variety of common experiential symptoms of depression and related conditions. These were coded based on the following operational definitions:

6. **Depression** – The presence of feeling sad or despondent.
7. **Anxiety** - The presence of apprehension or uneasiness.
8. **Body Discomfort** – The awareness of physical pain or an unpleasant bodily sensation.
9. **Fatigue** – feeling tired, exhausted, sleepy, etc.
10. **Boredom/Anhedonia** - an unpleasant, transient affective state in which the individual feels a pervasive lack of interest in and difficulty concentrating on the current activity.

The third group of codes included judgments about the nature of the experience present as described below:

11. **Feeling Valence:** When feelings were present, they were coded as being either negative (-1) or positive (1). If feelings were mixed or neutral, they were coded as neutral (0).
12. **Overall Valence:** For each moment we also coded the overall valence of the experience as negative (-1), neutral (0) or positive (1).

Finally, we included a fourth group of codes where we tried to identify instances when the experience was consistent with or representative of a number of constructs discussed in the broader literature on depression (e.g., Negative Cognitive Triad, Beck, 1964; Learned Helplessness Theory, Seligman, 1967). We used the following operational definitions and coded each for presence (1) or absence (0).

13. **Cognitive Triad – Self:** A negative view of the self.
14. **Cognitive Triad - World:** A negative view of the world.
15. **Cognitive Triad - Future:** A negative view of the future.
16. **Attribution:** A thought about the cause of event. We were also prepared to code attributions with regard to stability (stable vs. unstable), specificity (global vs. specific) and location of cause (internal vs. external), but we did not come to a consensus on identifying any moment of experience as representing attributions and thus these codes for the nature of an attribution were not used.

The final coding instructions were developed through multiple revisions by Heavey and Gunter. The initial operational definitions of the constructs were developed based on the DES Codebook Manual of Terminology (Hurlburt & Heavey, 2006), operational definitions from prior DES studies of depressed individuals, and a summary of the constructs from Cognitive Theories of Depression. Using these initial operational definitions, Gunter and Heavey coded each moment of experience for two of the participants and then reviewed the process, discussed disagreements, and adjusted the coding definitions accordingly. Gunter and Heavey then coded the moments of experience for two more depressed and nondepressed participants and a preliminary reliability analysis between the two coders demonstrated sufficient reliability. Once the operational definitions of the codes were fine-tuned, Gunter and Heavey independently coded the momentary experiences of the remaining twelve participants in a random order.

After the coding was completed, the results were reviewed to assess the reliability of the coding process. The following are the percentage agreement between the two raters: Inner Seeing = .98, Inner Speech = .99, Unsymbolized Thinking = .92, Feelings = .95, Feeling Valence = .95, Sensory Awareness = .93, Depression = .99, Anxiety = .98, Body Discomfort = .96, Fatigue = .99, Boredom/Anhedonia = .99, Content Valence = .92, Cognitive Triad – Self = .99, Cognitive Triad – World = .99, Cognitive Triad – Future = .99, Attribution = .99, Attribution – Stability = .99, Attribution – Control = .99, and Attribution – Locus of Causality = .99. Disagreements were reviewed to develop a consensus coding of each moment of experience.

The consensus coding for each moment were then analyzed to look at within group similarity and variability as well as between group differences. Independent -

sample  $t$  tests were used to determine the extent that Depressed and Nondepressed group were significantly different in CES-D scores, DES-related phenomena, and constructs associated with depression-related literature. In some instances, CES-D scores within the Depressed group were correlated with the sampling results. Effect sizes were calculated using Cohen's  $d$ .

## CHAPTER 4

### RESULTS

Table 1 presents the depressed and nondepressed participants' self-reported depression score on the CES-D at each point of administration. The group means and standard deviations also are presented. As can be seen, there were substantial differences in the expected direction for self-reported depression, with the Depressed group endorsing higher rates of depressive symptomatology at all points compared to the Nondepressed group. These differences were all statistically significant.

Table 1: CES-D Scores

| CES-D   | Depressed Mean | Depressed SD | Nondepressed Mean | Nondepressed SD | t Value | p Value | Effect Size |
|---------|----------------|--------------|-------------------|-----------------|---------|---------|-------------|
| Phase 2 | 34.56          | 6.19         | 3.56              | .88             | 14.88   | <.0001  | 7.01        |
| Day 1   | 25.22          | 5.91         | 3.13              | 3.27            | -9.35   | <.0001  | 4.63        |
| Day 2   | 20.89          | 6.03         | 2.56              | 4.10            | -7.54   | <.0001  | 3.55        |
| Day 3   | 18.89          | 5.51         | 2.89              | 2.21            | -8.09   | <.0001  | 3.81        |
| Day 4   | 14.67          | 6.00         | 3.89              | 5.40            | -4.01   | .001    | 1.88        |

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 means and standard deviations for the Depressed and Nondepressed groups. As can be seen in Table 2, there was substantial within subject variability in the relative percentage of moment containing each of these five commonly occurring phenomena. However, the average frequency of these five phenomena within the Depressed and Nondepressed



groups were very similar. None of the differences in the mean frequency between groups were statistically significant.

Table 2: Frequency of Five Common Phenomena of Inner Experience

| Participant                | Inner Speech | Inner Seeing | Unsymbolized Thinking | Feeling    | Sensory Awareness |
|----------------------------|--------------|--------------|-----------------------|------------|-------------------|
| <b><u>Depressed</u></b>    |              |              |                       |            |                   |
| 1                          | 18%          | 9%           | 18%                   | 9%         | 64%               |
| 2                          | 21%          | 5%           | 26%                   | 0%         | 32%               |
| 3                          | 43%          | 0%           | 33%                   | 14%        | 14%               |
| 4                          | 38%          | 29%          | 21%                   | 38%        | 8%                |
| 5                          | 13%          | 21%          | 29%                   | 13%        | 8%                |
| 6                          | 8%           | 50%          | 13%                   | 29%        | 4%                |
| 7                          | 13%          | 29%          | 33%                   | 33%        | 63%               |
| 8                          | 10%          | 29%          | 24%                   | 43%        | 19%               |
| 9                          | 16%          | 21%          | 42%                   | 58%        | 0%                |
| <b>Mean</b>                | <b>20%</b>   | <b>21%</b>   | <b>27%</b>            | <b>26%</b> | <b>24%</b>        |
| <b>SD</b>                  | <b>12%</b>   | <b>15%</b>   | <b>9%</b>             | <b>19%</b> | <b>24%</b>        |
| <b><u>Nondepressed</u></b> |              |              |                       |            |                   |
| 1                          | 38%          | 4%           | 33%                   | 21%        | 50%               |
| 2                          | 4%           | 0%           | 17%                   | 13%        | 8%                |
| 3                          | 8%           | 50%          | 13%                   | 21%        | 13%               |
| 4                          | 9%           | 30%          | 48%                   | 13%        | 9%                |
| 5                          | 13%          | 13%          | 42%                   | 21%        | 8%                |
| 6                          | 25%          | 4%           | 29%                   | 25%        | 63%               |
| 7                          | 9%           | 13%          | 13%                   | 48%        | 39%               |
| 8                          | 17%          | 13%          | 38%                   | 8%         | 21%               |
| 9                          | 8%           | 29%          | 54%                   | 33%        | 4%                |
| <b>Mean</b>                | <b>14%</b>   | <b>17%</b>   | <b>32%</b>            | <b>23%</b> | <b>24%</b>        |
| <b>SD</b>                  | <b>11%</b>   | <b>15%</b>   | <b>15%</b>            | <b>12%</b> | <b>21%</b>        |

Table 3 presents the percentages of positive and negative feelings and judgments about the percentage of moments that have an overall positive or negative content for both the Depressed and Nondepressed groups. No significant differences were found between groups regarding the frequency of positive feelings ( $d = .35$ ), negative feelings ( $d = .74$ ), positive content ( $d = .18$ ), and negative content ( $d = .68$ ). Although both the Depressed and Nondepressed groups had a higher frequency of negative feelings than

positive feelings, the relative proportions were more extreme in the Depressed group, with a ratio of more than three times as many negative feelings as positive feelings, whereas the Nondepressed group had a ratio of less than one and a half times as many negative feelings as positive feelings. Again, however, this difference in relative proportions of negative to positive feelings was not significant. Both groups also had a higher frequency of overall negative content compared to positive content, and again the relative ratio was more extreme in the Depressed group, but this difference in proportions also was not significant. A small but nonsignificant correlation ( $r = .29, ns$ ) was found in the Depressed group between the participant's percentage of moments containing negative feelings and his/her average CES-D score.

Table 3: Frequency of other Phenomena of Experience

| Participant         | Positive Feeling | Negative Feeling | Positive Content | Negative Content |
|---------------------|------------------|------------------|------------------|------------------|
| <b>Depressed</b>    |                  |                  |                  |                  |
| 1                   | 0%               | 9%               | 0%               | 18%              |
| 2                   | 0%               | 0%               | 5%               | 21%              |
| 3                   | 0%               | 14%              | 10%              | 14%              |
| 4                   | 4%               | 25%              | 4%               | 58%              |
| 5                   | 0%               | 13%              | 8%               | 8%               |
| 6                   | 0%               | 29%              | 4%               | 46%              |
| 7                   | 13%              | 21%              | 13%              | 33%              |
| 8                   | 19%              | 24%              | 38%              | 38%              |
| 9                   | 16%              | 42%              | 32%              | 47%              |
| <b>Mean</b>         | <b>6%</b>        | <b>20%</b>       | <b>13%</b>       | <b>32%</b>       |
| <b>SD</b>           | <b>8%</b>        | <b>12%</b>       | <b>13%</b>       | <b>6%</b>        |
| <b>Nondepressed</b> |                  |                  |                  |                  |
| 1                   | 0%               | 21%              | 0%               | 42%              |
| 2                   | 4%               | 8%               | 13%              | 8%               |
| 3                   | 4%               | 13%              | 8%               | 17%              |
| 4                   | 4%               | 9%               | 9%               | 39%              |
| 5                   | 8%               | 13%              | 13%              | 29%              |
| 6                   | 17%              | 8%               | 25%              | 17%              |
| 7                   | 26%              | 22%              | 30%              | 30%              |
| 8                   | 4%               | 4%               | 17%              | 25%              |
| 9                   | 17%              | 17%              | 17%              | 29%              |
| <b>Mean</b>         | <b>9%</b>        | <b>13%</b>       | <b>15%</b>       | <b>26%</b>       |
| <b>SD</b>           | <b>9%</b>        | <b>6%</b>        | <b>9%</b>        | <b>11%</b>       |

Table 4 presents the percentages of moments of experience that contained depressive experience, anxiety, or possible symptoms of depression including body discomfort, fatigue, and boredom. All of these types of experiences were infrequent, with none having a mean frequency higher than 9% of sampled moments. Moments containing depressive experience were very infrequent among both depressed and nondepressed participants. Although the mean frequency was higher for the Depressed group (4%) than the Nondepressed group (0.4%), the modal frequency for the Depressed

group was 0%, with 6 participants having no samples containing depressive experience. The difference between the groups was not statistically significant,  $t(16) = 1.5$ ,  $p = .15$ , but the effect size of the difference was medium,  $d = .71$ .

The patterns for Anxiety and Fatigue were very similar, with the Depressed group having higher mean frequencies than the Nondepressed groups and the effect sizes for the differences being medium to large ( $d = .70$  and  $.97$ , respectively) but the differences not reaching statistical significance ( $p = .16$  and  $.06$ , respectively). Again, for both Anxiety and Fatigue, the mean frequencies were low and the modal frequency was 0%. The difference in the mean frequencies for Body Discomfort between the groups also was not statistically significant ( $p = .61$ ) and it was small in magnitude ( $d = .25$ ). The minimal difference in the mean frequencies of Boredom was actually the reverse of the expected direction.

Table 4: Frequency of Depressive-Related Symptoms

| Participant                | Depression | Anxiety   | Body Discomfort | Fatigue   | Boredom   |
|----------------------------|------------|-----------|-----------------|-----------|-----------|
| <b><u>Depressed</u></b>    |            |           |                 |           |           |
| 1                          | 0%         | 9%        | 14%             | 5%        | 0%        |
| 2                          | 0%         | 0%        | 11%             | 21%       | 0%        |
| 3                          | 0%         | 5%        | 0%              | 5%        | 5%        |
| 4                          | 0%         | 21%       | 0%              | 8%        | 0%        |
| 5                          | 0%         | 0%        | 4%              | 0%        | 0%        |
| 6                          | 4%         | 8%        | 13%             | 13%       | 0%        |
| 7                          | 0%         | 17%       | 13%             | 0%        | 0%        |
| 8                          | 14%        | 0%        | 5%              | 5%        | 10%       |
| 9                          | 16%        | 16%       | 11%             | 11%       | 0%        |
| <b>Mean</b>                | <b>4%</b>  | <b>8%</b> | <b>8%</b>       | <b>7%</b> | <b>2%</b> |
| <b>SD</b>                  | <b>7%</b>  | <b>8%</b> | <b>6%</b>       | <b>7%</b> | <b>4%</b> |
| <b><u>Nondepressed</u></b> |            |           |                 |           |           |
| 1                          | 4%         | 0%        | 21%             | 8%        | 0%        |
| 2                          | 0%         | 4%        | 0%              | 0%        | 0%        |
| 3                          | 0%         | 0%        | 0%              | 0%        | 0%        |
| 4                          | 0%         | 4%        | 17%             | 0%        | 0%        |
| 5                          | 0%         | 4%        | 0%              | 0%        | 8%        |
| 6                          | 0%         | 4%        | 13%             | 0%        | 0%        |
| 7                          | 0%         | 17%       | 4%              | 9%        | 9%        |
| 8                          | 0%         | 0%        | 0%              | 0%        | 4%        |
| 9                          | 0%         | 0%        | 0%              | 4%        | 0%        |
| <b>Mean</b>                | <b>.5%</b> | <b>4%</b> | <b>6%</b>       | <b>2%</b> | <b>2%</b> |
| <b>SD</b>                  | <b>1%</b>  | <b>5%</b> | <b>9%</b>       | <b>4%</b> | <b>4%</b> |

Although six of the participants in the Depressed group did not have moments of depressive experience, three of the participants did have moments containing depressive experience. Those three participants did not have higher average CES-D scores compared to the other depressed participants, falling third, fifth, and seventh highest within the Depressed group. In total, there were seven moments containing elements of depression or sadness in the Depressed group (out of a total of 198 sampled moments) and one moment in the Nondepressed group (out of a total of 214 sampled moments).

The following are the eight identified depressed moments in the study:

1. Depressed Participant 6, Day 2, Beep 1: He was driving his car to school. He had just listened to a song that reminded him of his ex-girlfriend. At the moment of the beep he was seeing his ex-girlfriend. He was thinking about her, what they had gone through, her and her new boyfriend, and whether she was happy. He was feeling sad which he experienced as heavy pressure and difficulty breathing. The difficulty breathing was experienced as bubbling inwards and outwards of his chest.
2. Depressed Participant 8, Day 1, Beep 1: She was watching TV, but not paying attention to it. At the moment of the beep, she was thinking about her schoolwork, how she was falling behind, and her grades were too low. These were ideas that were not in words or images. She may have been thinking these thoughts sequentially, but she could not remember which exact thought was present at the moment of the beep. She was feeling upset, down, stressed out, and tired which she experienced as related to the thought. She didn't want to do anything, which she experienced as both a thought and feeling.
3. Depressed Participant 8, Day 1, Beep 4: She had an upsetting telephone conversation with her ex-boyfriend. At the moment of the beep, she was feeling a blended emotion of mostly anger with a little bit of sadness. She could not provide experiential details of this feeling, but she did experience it as related to her thoughts. She was thinking that she couldn't believe she was upset about it, that she shouldn't care, and that she wanted to punch something. These thoughts were all occurring together without images or words. There was a characteristic of

- racing to her thinking. After the beep, she realized that at the moment she had her fists clenched, her heart was pounding, and she was crying.
4. Depressed Participant 8, Day 3, Beep 3: She was singing along to an Akon song. At the moment of the beep, she was hearing the song playing out loud, singing it out loud, and hearing herself singing it. She was also feeling sad. The sadness was partially experienced as a physical sensation of emptiness in her stomach area.
  5. Depressed Participant 9, Day 1, Beep 1: He was at work and had run into a regular guest. The guest was telling him about his dad dying which made the participant think about his own dad's death. At the moment of the beep, he was feeling uncomfortable and nervous. This was experienced as a mild bubblyness in the middle of his abdomen (gut region) that was spreading outward. He was feeling sad, both for the guest and himself. He was unable to articulate how the sadness was in his awareness. It seemed to be experienced as related to a thought he was having. The thought was about if he would ever get over his dad's death. This thought was not in words or images. He was also hearing the guest talking, but not paying much attention to what he was saying. Looking back, he realized that he had been trying to pull away from the conversation. This was a very difficult moment for him to talk about. He said that he was having a similar experience of uncomfortable/nervousness and sadness as he was telling me about the moment. He appeared upset and approaching tears. He openly acknowledged the difficulty of talking about the moment, but when given an opportunity to omit its discussion, he opted to do his best to talk about it.

6. Depressed Participant 9, Day 2, Beep 3: He had been watching Family Guy. In the show, they had just made a joke that the participant and his boyfriend often repeat. At the moment of the beep, he was saying out loud with lower volume than he would use in a conversation, “Oh God, I miss Phil. (his boyfriend).” He was thinking about how his relationship eventually has to stop and that it is becoming pointless (because his boyfriend lives in another city). This thought was not in images or words. He was feeling of sad/hopeless which he experienced as related to the thought. There were no other experiential details of the feeling.
7. Depressed Participant 9, Day 2, Beep 5: He has been watching Frasier but was not paying attention to the show at the moment of the beep. At the moment of the beep he was thinking about his stepmom. (He had found out a couple days ago that she had died about 8 months ago). He was innerly seeing a collage or rapid cycling of images related to his stepmom. He had difficulty articulating which images were present which seemed to be related to both them quickly coming in and out of awareness and the presence of multiple images at once. The images were related to various ideas of his stepmom; that he wasn't going to have another chance to talk to her; remembering laying on the couch watching TV with her; putting flowers on her grave when he goes to visit his family. At the same time, he was innerly smelling her fragrance. He was feeling sadness. After the beep, he realized that he had been tearing up.
8. Nondepressed Participant 1, Day 2, Beep 4: The television show John and Kate plus 8 was on TV but at the moment she was feeling really sad/mopey/sluggish, which she experienced as her heart weighing more that it should. She was feeling



sluggish in her whole body. Connected to this feeling was the thought about her boyfriend and wondering what he was doing and if she should call him. She was also aware of the television noise, but not paying attention to it.

A feeling of sadness was a common element reflected in these moments. In addition, seven of the eight moments included thoughts (i.e., inner speech, unsymbolized thinking, inner seeing) and six of those seven thoughts involved a significant person of his/her life. Four of these moments contained bodily sensations in the torso area, whereas four had no bodily sensations related to the experienced feeling. The only depressed moment identified in the Nondepressed group did not seem noticeably different from the depressed moments identified in the Depressed group.

Given that the frequency of depressed moments was so low, no solid conclusions can be drawn about the nature or characteristics of the inner experience of depression. However, we can say at the very least that the frequency of moments containing or reflecting depression in the Depressed group appeared to be much lower than expected based on the self-report measure of depressive symptomatology. There was no correlation ( $r = .08, ns$ ) in the Depressed group between a participant's percentage of moments containing depressive content and his/her corresponding average CES-D score.

Finally, moments that were judged to reflect a negative view of the self, world or future (i.e., Beck's Cognitive Triad) were very infrequent. For each of the three dimensions, there were two samples judged to be consistent or reflective of it in the Depressed group and one sample in the Nondepressed group. Thus the relative frequencies of these constructs were all 1% or lower. There were no moments in either group judged to contain or reflect negative attributions. The percentages of moments that

reflected a negative attribution or a negative view of the self, world or future are presented in Table 5.

Table 5: Frequency of Cognitive Theories of Depression

| Participant                | Negative View of Self | Negative View of World | Negative View of Future | Negative Attribution |
|----------------------------|-----------------------|------------------------|-------------------------|----------------------|
| <b><u>Depressed</u></b>    |                       |                        |                         |                      |
| 1                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 2                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 3                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 4                          | 4%                    | 0%                     | 0%                      | 0%                   |
| 5                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 6                          | 0%                    | 4%                     | 4%                      | 0%                   |
| 7                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 8                          | 5%                    | 0%                     | 0%                      | 0%                   |
| 9                          | 0%                    | 5%                     | 5%                      | 0%                   |
| <b>Mean</b>                | <b>1%</b>             | <b>1%</b>              | <b>1%</b>               | <b>0%</b>            |
| <b>SD</b>                  | <b>2%</b>             | <b>2%</b>              | <b>2%</b>               | <b>0%</b>            |
| <b><u>Nondepressed</u></b> |                       |                        |                         |                      |
| 1                          | 0%                    | 4%                     | 0%                      | 0%                   |
| 2                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 3                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 4                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 5                          | 0%                    | 0%                     | 4%                      | 0%                   |
| 6                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 7                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 8                          | 0%                    | 0%                     | 0%                      | 0%                   |
| 9                          | 4%                    | 0%                     | 0%                      | 0%                   |
| <b>Mean</b>                | <b>.5%</b>            | <b>.5%</b>             | <b>.5%</b>              | <b>0%</b>            |
| <b>SD</b>                  | <b>1%</b>             | <b>1%</b>              | <b>1%</b>               | <b>0%</b>            |

## CHAPTER 5

### DISCUSSION

The goal of this study was to examine the inner experience of depressed and nondepressed individuals, looking for similarities within the groups and differences between them. Aspects of experience examined included common phenomena identified in previous DES studies and experiences and constructs discussed in the depression-related literature. Additionally, the study also looked for other differences between Depressed and Nondepressed groups and examined moments that contained sadness or other depression-related experiences.

Results from the Center for Epidemiology Studies – Depression scale (CES-D) indicate that the Depressed and Nondepressed groups were meaningfully different, and that the Depressed group had severe symptoms of depression during the qualification phase of the study (Phase 2), declining to mild symptoms of depression over the course of the four sampling days. It was unusual to have a group of depressed participants improve from severe to mild depressive symptomatology over such a brief timeframe as an untreated depressed episode typically lasts for four months or longer (Kessler et al., 2003; APA, 2000). Although we cannot know for sure why the self-reported depressive symptomatology of these participants declined so rapidly, the two most likely explanations are something about the nature of the sample or something about the nature of the procedure. The sample was comprised of college students and mostly young adults. There is some evidence that college students experience depression in a more transient fashion than the general population (Oswalt & Finkleberg, 1995). It is also

possible that the promise of credits that go towards a participant's grade in his/her class led to initial over reporting of depressive symptomatology, though this seems unlikely.

With regard to the procedure, it may be that Descriptive Experience Sampling (DES) led to the decline in self-reported depression. Two different though not necessarily mutually exclusive mechanisms could have accounted for this. First, DES could have improved a person's awareness of his/her inner experience in a way that led participants to conclude that they were actually experiencing depression less severely or less often than they initially believed. This would be consistent with the DES findings about the inner experience of the depressed participants discussed below. Second, DES could have actually altered the depressed participants' inner experience. DES participants almost universally report finding the process a positive experience. Additionally, there is very little attrition once participants begin sampling, which is indirect evidence that participants find the sampling process a positive experience. In many ways the process of DES can be considered similar to what are considered common curative factors in psychotherapy, such as nonjudgmental attention and becoming more self-aware. Thus it is possible that the DES procedure actually helped to ameliorate the existing depression. To be clear, we must consider this entirely speculative at this point as data do not exist to support this assertion.

Despite the rapid decline in self-reported depressive symptomatology in the Depressed group over the course of the study, the differences between the Depressed and Nondepressed groups were statistically significant and large at qualification and on each of the four sampling days. Much of this was due to the very low levels of depressive

symptomatology reported in the Nondepressed group. Overall, the aim of constituting two groups differing on level of depression for comparison was achieved.

The differences in the inner experiences of these two groups, however, were much less pronounced than the differences in their levels of self-reported depressive symptomatology. First, none of the constructs representing frequent phenomena of inner experience identified in prior DES studies differed between the groups (inner speech, inner seeing, unsymbolized thinking, feelings and sensory awareness). As in previous studies, there was substantial variability in the relative frequency of these phenomena across individuals, but this variability was not related to group membership nor were there any meaningful (or statistically significant) differences in the average levels of these phenomena between groups. Furthermore, the average levels of these phenomena within both groups were close to average levels found by Heavey and Hurlburt (2008). Thus there were no indications that the relative frequencies of the most common phenomena of inner experience were related to depression status.

When examining aspects of experience more directly related to depression, almost all of the observed differences were in the expected direction, but the magnitude of the differences were not large enough with the moderately sized sample to lead to statistically significant differences. For example, the Depressed group experienced negative feelings more frequently than the Nondepressed groups and positive feelings less frequently. The magnitude of the difference in relative frequency of negative feelings was medium and the magnitude of the difference in the relative frequency of positive feelings was small. Moreover, the ratio of negative to positive feelings was more extreme in the Nondepressed group. However, none of these differences were

statistically significant. The ratio of negative to positive feelings for the depressed (3.3:1) and Nondepressed groups (1.4:1) were similar to those observed by Perlotto (2001), 4:1 and 1:1, respectively.

A similar, though somewhat less pronounced pattern was found for overall positive and negative content. The differences were in the expected direction with a medium effect for negative content and a small effect for positive content, and the negative/positive ratio was more extreme in the Nondepressed group than the Depressed group. Again, none of these differences were statistically significant.

Each moment was also examined to determine whether it contained the experience of depression or related symptoms including anxiety, body discomfort, fatigue and boredom. Momentary experiences that were observed to have depressive content rarely occurred in this study and were only observed in one nondepressed and three depressed participants. Despite the low frequency of depressive content in this study there was a medium effect size for the groups in the expected direction, but this difference was not statistically significant. Gunter (2008) found a significantly higher rate of depressive content in the momentary experiences of depressed individuals compared to the nondepressed individuals.

The frequency of other depression-related symptoms including anxiety, body discomfort, and fatigue were all judged to have occurred at a higher rate in the Depressed group, however none of those differences reached statistical significance. Despite not reaching statistical significance, moments that were judged to have anxiety or fatigue had medium to large effect sizes between the groups, whereas the body discomfort construct had a small effect size. Boredom was found at a similar frequency between the groups.

In contrast, Gunter (2008) found a significantly higher frequency of anxiety content in the momentary experiences of depressed individuals than the nondepressed individuals.

Though none of the constructs related to depression were found to significantly differ between groups, we looked at each individual moment that contained depressive experience to identify common characteristics between or within groups. In each moment a feeling of sadness was commonly described among participants. The majority of these moments also included thoughts (i.e., inner speech, unsymbolized thinking, inner seeing) about a significant person of his/her life. In addition, half of these moments contained bodily sensations in the torso area. There did not appear to be any markedly different aspects of experience in these moments between the groups.

No solid conclusions can be drawn about the nature or characteristics of the inner experience of depression as frequency of moments containing the experience of depression identified by DES was low. Notably, moments containing the experience of depression as identified by DES were strikingly low in comparison to depressive content identified on the CES-D self-report measure. For example, on average participants in the depressed group endorsed items such as "I felt depressed" or "I felt sad" approximately 1-4 days a week over the course of the study. The same participants rarely reported inner experience reflecting depression over the same days.

There were also few moments of experience consistent with the cognitive theory of depression and the helplessness-hopelessness theory of depression. In fact, no moments of experience related to attributional theory, whether positive, negative, or neutral were found in this study. A prior DES study, Cavenagh (2003), was also unable to find a significant difference in attributional styles between depressed and nondepressed

participants. It may be beyond the scope of DES to capture a negative attributions. It may also be that attributions are simply very low frequency events and therefore were missed by the relatively few samples obtained from each subject.

The cognitive theory of depression did not fare much better than the helplessness-hopelessness theory of depression in this study. Momentary experiences were coded as representing the cognitive theory of depression if a negative view of the self, world, or future were identified. Only two moments in all of the Depressed groups' sampled moments, and one moment in the Nondepressed groups' sampled moments, were identified as representing the cognitive theory of depression. The low frequency of examples of the cognitive theory of depression contrasts with Gunter (2008). He found more frequent evidence of the cognitive theory of depression in sampled moments using DES. Specifically, Gunter (2008) found higher frequencies of dysfunctional attitudes, the negative cognitive triad, and negative automatic thoughts in momentary experiences of depressed participants compared to nondepressed participants. It is unlikely, had we coded for dysfunctional attitudes or negative automatic thoughts, that a meaningful difference would have emerged regarding the negative cognitive triad given that Gunter (2008) had very high convergence between depressive content, dysfunctional attitudes, the negative cognitive triad, and negative automatic thoughts.

Overall, moments of experience consistent with the cognitive theory of depression (Beck, 1967) and the helplessness-hopelessness theory of depression (Seligman, 1975; Abramson et al., 1989) were not identified often in this study and there is little support in these data for either theory being representative of the inner experience of depressed individuals. A possibility for the infrequency of momentary experiences that support the



cognitive theories may be that it is rare for these constructs to be present in momentary experiences. Despite the fact that the theories address the nature of inner experience in those suffering from depression, it may be the case that the theories are based primarily on retrospective self-reports and are tapping into negative schemas for the individual or into a systematic way of self-reporting depressive symptomatology. Depressive symptomatology may actually occur at a much smaller frequency in momentary experiences of depressed participants, as was found in this study, compared to what is suggested by the theories and/or self-reported by depressed participants when using moderately or highly retrospective measures.

Another possibility for the infrequency of depressive content in this study is that DES is unable to access the level of consciousness that is more representative of or consistent with these theories. The Cognitive theories of depression may not be found in DES studies because they exist at some other level than what is directly present in momentary experience.

It may be that more retrospective measures like the CES-D tap different memory systems than less retrospective methods like DES. For example, as time passes, recall of contextual details declines which may cause random and systematic retrospective biases (Robinson & Clore, 2002). As details are lost, the memory of an emotion shifts from episodic memory to semantic memory. Once semantic memory has taken over for an event, other retrospective biases may become involved, such as belief-consistent bias (Robinson & Clore, 2002). It may be in fact that the depressed participants relied on his/her semantic memory to characterize themselves over a week's time when answering questions on the CES-D related to depressive symptomatology. If the depressed

participants did rely on semantic memory to complete self-report data, they may have fallen victim to belief-consistent bias and which could lead to systematic overreporting of depressive symptomatology. DES minimizes errors associated with semantic memory by minimizing retrospection and therefore may lead to a more accurate portrait of momentary inner experiences (Hurlburt, Heavey, & Seibert, 2006).

Consistent with the notion that the CES-D and DES tap different memory systems; studies have shown that a person's ability to characterize themselves over time can be remarkably inaccurate (Mokros, 1993; Stone et al., 2000). For instance, Mokros (1993) found that depressed participants reported more sadness than the control participants during a clinical interview; however both groups showed similar rates of sadness in the data collected using the Experience Sampling Method. In another study, Stone et al., (2000) monitored pain levels of 32 participants suffering from rheumatoid arthritis over a 7-day period using Ecological Momentary Assessment. On the eighth day he asked the participants to recall their average pain level over the 7-day period. He concluded that the best predictors of pain level were a combination of peak and recent pain rather than a simple average of all momentary pain reports. Thus, the finding that the frequency of depressive experience discovered by DES was substantially less than what would be expected based on the depressed participants' CES-D reports is consistent with previous research showing the difficulty of providing accurate characterizations of experience over time.

Another possible explanation for the discrepancy between the CES-D reports and those obtained via DES is that the CES-D may have tapped into depressive self-schemas which are purported by the Cognitive Theory of Depression (Beck, 1964). It may be

beyond the scope of DES to capture depressive self-schemas they may involve a cognitive process that occurs outside of direct awareness. Thus, a depressive self-schema may have been active in a person's self-report of depressive symptomatology during his/her completion of a self-report questionnaire but may not have had as large an impact on a participant's sampling data due to the focus of DES on ongoing experience.

### *Limitations of the Present Study*

The present study had a number of limitations. First, the sample size was relatively small, though actually large for a DES study. The DES procedure is time consuming by nature and thus a larger sample size would have required more resources than were available to the researchers. 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 that participants were selected from a college population and thus the results may not generalize to the wider population.

The scope of study allowed data collection over only four days. Essentially only about 24 seconds of each participant's life were collected, which is a small amount of time. Such a narrow sample of momentary experiences may not provide an actual representation of the daily life of an individual.

In addition, the observed variability in experience may have been due to differences in the conditions under which participants sampled, especially individuals in the Depressed group. Participants were free to collect their experiences at their convenience over the course of four days. Apathy, isolation and lack of motivation are

core symptoms of depression. The DES procedure is task oriented and it requires some commitment and motivation to capture inner experience promptly and accurately when the beep sounds. DES interview requires collaboration with an interviewer to unpack the description of one's momentary experience. It may feel highly personal and interactive. Such a procedure may not seem appealing to someone during a depressive episode. It may be that depressed participants avoided DES sampling of days when they felt more depressed and preferred to sample on days when they felt more energetic and sociable, thereby decreasing the differences between the groups. It is also possible that the reverse may be true, that the interactive and personal nature of the DES procedure may have lessened the depression of those in the Depressed group, thereby decreasing the differences between the groups.

Another limitation of the study was that the researchers were not blind to the group membership of the participants. Being blind to the participants' group membership was difficult because the symptoms of depression were easily observable in the presentation of the participants. The lack of objectivity on behalf of the researcher may have led to some degree of biased interviewing, though this seems unlikely given the observed results. For example, had the interviewing been substantially biased by the self-report questionnaires, the observed differences in inner experience presumably would have been larger.

Additionally, the researchers used the samples 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 sufficient similarity in experiences across days to

use the data from the first day and, given the declining self-reported symptoms of depression across sampling days, it was judged to be worth the risk.

Another limitation of this study is that the researchers were not expert DES interviewers. The DES interview requires a high level of skill and practice and has generally been known to take a long time to master. To minimize this limitation, the researchers attempted to gain ample amounts of training by practicing interview skills on other participants while receiving in-vivo supervision by the inventor of the method, Dr. Russell Hurlburt and a well-established interviewer, Dr. Christopher Heavey. The researchers acquired additional training by reading books on the topic authored by Dr. Hurlburt and Dr. Heavey, participated in DES laboratory meetings, and transcribed DES interviews. In addition, Dr. Heavey sat in on some of the interviews; the researchers randomly viewed the videos of DES interviews and received feedback on their performance to maximize the chances that DES was appropriately conducted. The researchers' DES skills were considered adequate.

Furthermore, the researchers did not establish reliability with regard to written descriptions of the experience. In order to maximize the reliability of the description of experience, the researchers collaborated with the participant after each experience had been described. Dr. Heavey then reviewed each written description of experience. The researchers 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.

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). Also, this finding held true when we compared the participants who completed the procedure under each of the DES interviewers (Gunter and Lefforge). Further evidence that the researchers did an adequate job in written descriptions comes from the fact that the researchers' characterization of different participants are different from each other, indicating that active presuppositions did not lead to everyone's inner experience being described as alike. These factors provide evidence that the researchers adequately employed DES.

### *Conclusions and Suggestions for Future Research*

This study examined the inner experience of two groups of individuals who, based on self-report questionnaires, differed substantially in levels of depression. The most common phenomena of inner experience (Heavey & Hurlburt, 2008) did not differ between the groups. However, when examining aspects of experience more directly related to depression, almost all of the observed differences were in the expected direction, though not large enough in magnitude with the moderately-sized sample to be statistically significant. For instance, the Depressed group experienced depressive content, negative feelings, anxiety, body discomfort, and fatigue more frequently than the Nondepressed group and positive feelings less frequently. In addition, the Depressed group was judged to have more negative content and less positive content than the Nondepressed group.

This contrast between the relative infrequency of depressive content observed in the Depressed group and the high to moderate levels of depressive symptoms indicated

on the self-report questionnaire is important. These findings suggest the possibility that the types of highly retrospective reports of inner experience requested by questionnaires or clinical interviews may overstate, perhaps substantially, the actual presence of depressive experiences. DES methodology of relying minimally on memory and more heavily on the pristine momentary experience may provide a better understanding of the everyday experiences of individuals with various levels of self-reported depression. It may also be that depression exists more at the level of a cognitive process rather than in ongoing experience, thus influencing retrospective reports more than ongoing experience.

Future studies should include replication of this study utilizing a larger sample size. It would also be desirable to collect a larger number of momentary experiences from the participants, perhaps eight sampling days. A future study could add a step in the DES process to record what was happening at or just before the beep to perhaps aid in raters' judgments of momentary experiences that involve attributions. Another suggestion would be to include a longer-term sampling component focusing on determining whether or not momentary experiences of participants change in a systematic way prior to, at the time of, or after a depressive episode. In addition to this recommendation, it would be important to collect self-report data of depressive symptomatology to determine if the self-reported data corresponds with findings from DES data. Future studies may want to sample participants on consecutive days until the procedure is finished in an effort to capture depressed momentary experiences at potentially the most severely depressed period. For instance, the participants in this study decreased in self-reported symptomatology of depression relatively quickly.

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## VITA

### JEDIDIAH GUNTER

#### EDUCATION

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|-------------|--|---|
| August 2011 | University of Nevada, Las Vegas<br>Las Vegas, NV         | Ph.D. Clinical Psychology<br>Doctoral Candidate |
| 2008        | University of Nevada, Las Vegas<br>Las Vegas, NV         | M.A. Clinical Psychology                        |
| 2004        | University of California, Los Angeles<br>Los Angeles, CA | B.A. Psychology                                 |

#### CLINICAL EXPERIENCE

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January 2011 – Current                      Psychologist Fellow  
Dr. Etkoff and Associates  
Las Vegas, Nevada

- Provide assessments to children and young adults in relation to school problems. With regard to forensic/legal cases, I am responsible for medical/legal records review, administering assessments, and writing reports. Duties include: scoring, administering, and interpreting assessment data, report writing, dictating reports, and forensic records review.

Supervisors: Lewis Etkoff, Ph.D

July 2009 – July 2010                      Psychology Intern  
New Mexico Veteran Affairs Health Care System  
Albuquerque, New Mexico

- Completed rotations in Forensic Psychology (NMWCF), Neuropsychology, Spinal Cord Injury, Behavior Health, and Psychosocial Rehabilitation. Responsibilities included individual therapy, group therapy, crisis interventions, brief assessments, neuropsychological assessments, and participating in multidisciplinary treatment team meetings.

Supervisors: Yvonne Lutter, PsyD; Kathleen Padilla, Ph.D; Brian Pilgrim, Ph.D; and Rex Swanda, Ph.D.

June 2007 – June 2009                      Psychodiagnostician  
Dr. Etkoff and Associates  
Las Vegas, Nevada

- Responsible for conducting assessments of children in relation to school problems and adults in relation to neuropsychological and forensic cases at a private neuropsychological practice (clinical & forensic). Duties include: scoring, administering, and interpreting assessment data, report writing, dictating reports, and forensic records review.

Supervisors: Lewis Etcoff, Ph.D and Teri Forrest, Ph.D.

#### TEACHING EXPERIENCE

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August 2006 – June 2009

Part Time Instructor  
University of Nevada, Las Vegas  
Las Vegas, Nevada

- Taught ten sections of Introductory Psychology, one section of Child Behavior Disorders and three sections of Abnormal Psychology. Responsible for preparation and delivery of lecture, stimulating discussion, assigning and tracking homework, and developing and grading examinations. Six sections of Introductory Psychology were Distance Education courses.