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# Cognitive errors and coping patterns in Major Depressive Disorder and how they change over the course of cognitive therapy

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## Abstract

Major Depressive Disorder (MDD), affects up to 16.2% of adults (Kessler et al., 2003), and is associated with immense personal suffering, and decreases in functioning and well-being (Scott & Sensky, 2003). The most well researched psychological treatment for depression is cognitive therapy (CT), developed by Beck and colleagues (Beck et al., 1979). Integral to CT is that negative early life experiences may create latent cognitive vulnerabilities in the form of core beliefs. Once activated by stressful events, these core beliefs may give rise to other forms of distorted cognitions such as dysfunctional attitudes, automatic thoughts, and cognitive errors, which reinforce depressive thinking and maintain symptoms of depression (Sacco & Beck, 1995). Similarly, coping patterns may also amplify or reduce the impacts of stress (Skinner et al., 2003). As such, CT aims to treat depression by reducing cognitive distortions and increasing the use of adaptive coping patterns (Oei & Free, 1995). Although the efficacy of CT has been well established (e.g., Dobson, 1989; Driessen & Hollon, 2010; Lynch, Laws, & McKenna, 2010), little is known about the mechanisms through which its successful results are achieved (Kazdin, 2007). Few studies have examined the frequency and type of cognitive errors and coping patterns in depression, nor how these variables change over the course of CT. In a series of three studies, this dissertation examined: 1. An early therapy profile of cognitive errors in depression, 2. Changes in cognitive errors from early to late cognitive therapy, 3. An early therapy profile of coping patterns in depression, and 4. Changes in

coping patterns over the course of CT. Implications for research and practice are discussed.

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**Résumé**

Les troubles dépressifs majeurs (TDM) affectent jusqu'à 16.2% de la population adulte (Kessler et al., 2003), infligent de la souffrance et diminuent les capacités et le bien-être des personnes affligées (Scott et Sensky, 2003). De nombreuses recherches ont été effectuées sur l'efficacité de la thérapie cognitivo-comportementale (TC) développée par Beck et ses collègues (Beck et al., 1979) pour le traitement de la dépression. Selon la théorie derrière la TC, les expériences négatives de l'enfance peuvent créer des vulnérabilités cognitives latentes sous la forme d'idées préconçues. Une fois activées par des événements stressants, ces idées préconçues peuvent donner naissance à d'autres problèmes cognitifs tels qu'une attitude dysfonctionnelle, de la pensée automatique et des erreurs cognitives qui renforcent l'état dépressif et maintiennent les symptômes de la dépression (Sacco et Beck, 1995). D'autre part, les stratégies d'évitement peuvent amplifier ou réduire les impacts du stress (Skinner et al., 2003). Conséquemment, la TC vise à traiter la dépression en réduisant les distorsions cognitives et en augmentant l'usage de stratégies adaptativs (Oei et Free, 1995). Même si l'efficacité de la TC est bien établie (e.g. Dobson, 1989; Driessen & Hollon, 2010; Lynch, Laws, & McKenna, 2010), les mécanismes d'action menant aux résultats positifs sont peu connus (Kazdin, 2007). Peu d'études ont examiné la fréquence, le type d'erreurs cognitives et la transformation des stratégies d'évitement tout au long du traitement de la dépression ainsi que la façon que ces variables changent en cours de thérapie. Un traitement efficace ne devrait pas seulement faire disparaître les symptômes de la dépression mais aussi affecter les

facteurs sous-jacents qui selon la théorie, mènent à la condition dépressive. Dans une série de trois études, cette dissertation a examiné les points suivants : 1. Le profil d'erreurs cognitive au début de la thérapie, 2. Le changement dans les erreurs cognitives durant la thérapie, 3. Le profil de stratégies de *coping* au début du traitement et 4. Le changement dans les stratégies de *coping* en cours de thérapie. Les implications pour la recherche et la pratique sont abordées.

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researcher, clinician, mentor, and supervisor, who not only develops forward-thinking ideas, but also has the courage and dedication to actualize those ideas and make meaningful changes to established norms. I feel tremendously fortunate to have had the opportunity to work with Dr. Drapeau, and am indebted to his kindness, generosity, help, friendship, and support throughout my years at McGill University.

I would also like to express my sincere gratitude to my committee member Dr. Keith Dobson for helping me with my dissertation over the past few years. As a professor and head of Psychology at the University of Calgary, Dr. Dobson helped me largely via email. Despite this medium, Dr. Dobson's extensive knowledge, integrity, and kindness were conveyed in spades. He answered all of my questions in a timely manner, and in such great detail, that I was better able to understand the fine nuances of the existing literature, and to weigh the pros and cons of various scientific decisions. Dr. Dobson's respectful, supportive, and informative supervisory style made the writing phases of the dissertation a valuable learning opportunity. His dedication towards the pursuit of knowledge, and musings about the integration of theory and practice were enjoyable and inspiring. Although a leading expert in the field of psychology, his humble attitude allowed me to feel more like a peer in the co-creation of new knowledge.

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I would also like to thank my partner François Lepage for his help, and support throughout the challenging portions of the doctoral program, including the dissertation process. François' joie de vivre inspired me to more fully enjoy life, in addition to meeting the demands required of me by my academic pursuits. François' loyalty, devotion, patience, empathy, easygoing attitude, and love have maintained my spirits during what often seemed like insurmountable tasks.

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## Contribution of Authors

This dissertation comprises three co-authored manuscripts. I am the first author on each, as I completed the literature reviews, generated the research questions, analyzed the data, and wrote the dissertation in its entirety. All three manuscripts are co-authored by Drs. Drapeau and Dobson.

My doctoral supervisor, Dr. Drapeau, trained me on the two observer-rated measures that were used in this research; the Coping Errors Rating System (Drapeau, Perry, & Dunkley, 2008), and the Coping Patterns Rating System (Perry, Drapeau, Dunkley, 2007). He contributed to the conceptualization of the dissertation and the formulation of research questions, provided input and advice on statistics, and provided editorial comments on the dissertation.

My committee member Dr. Dobson, worked in an advisory capacity throughout the planning and writing phases of the dissertation. He provided information and guidance on all aspects of the literature reviews and manuscripts, including clarification on various aspects of the existing literature, feedback about statistics and methodological considerations, and editorial comments. He also generously provided access to his pre-existing dataset that was used in the dissertation.

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## Introduction

Major Depressive Disorder (MDD) affects up to 16.2% of adults (Kessler et al., 2003) and is associated with immense suffering, and significant decreases in functioning and well-being (Scott & Sensky, 2003). The World Health Organization predicted MDD to become the 2nd largest cause of medical disability worldwide by the year 2020. A recent Canadian study estimated the costs of depression at $14.4 billion, making depression among the costliest conditions in Canada (Stephens & Joubert, 2001). In Western countries, first-line treatments for depression include antidepressant medications and cognitive behaviour therapy (National Institute for Health and Clinical Excellence, 2009; Parker, Roy, & Eyers, 2003). During treatment medications are less expensive than psychotherapy, but the long-term costs may be higher (e.g., Tang, DeRubeis, Hollon, Amsterdam, & Sheldon, 2007).

Cognitive behaviour therapy (CBT) is an umbrella term for a number of therapies that emphasize the importance of identifying and altering cognitions for the purpose of reducing distressing feelings and inspiring desired behavioral changes (Dobson & Dozois, 2001). The most extensively researched and practiced form of CBT is called cognitive therapy, which was developed by Beck, Rush, Shaw, and Emery in 1979. Distinguishing the exact form of CBT that was used in any given study is quite difficult, the reasons for which have been described by Aaron T. Beck (2005):

> "The terms [cognitive therapy] (CT) and *cognitive behavioral therapy* (CBT) are frequently used as synonyms to describe CT based on the

> cognitive model. However, the term CBT is also used to designate a package of techniques in which a CT module is used in combination with a set of behavioral modules. In addition, CBT has been used as an umbrella term to include both standard CT and the atheoretical combination of cognitive and behavioral strategies. Because the literature reviews generally combine studies labeled CBT and CT under the CBT label, I will present the findings of these reviews and, where possible, summarize the more obvious CT studies" (p. 955).

**Key Features of Cognitive Behavioural Therapy**

Cognitive behavioural therapists adhere to a stress-diathesis model of depression (Sacco & Beck, 1995). Early life experiences are believed to play a key role in the development of negative schemas, which are deeply held beliefs about oneself, the world, and the future. These schemas serve as the diathesis or predisposition towards depression, remaining latent until a negative event triggers the underlying schema, resulting in activation of the schema, the production of distorted information processing, and subsequent feelings of depression. Activating events are often similar in nature to the negative events that created the schema during early life. Although CBT therapists do not claim that schemas and cognitive distortions are the ultimate causes of depression, they are considered to be a main pathway leading to the development and perpetuation of depressive symptoms (Beck, Rush, Shaw, & Emery, 1979).

Given the key role that cognitive variables play in both the onset and maintenance of depression, treatment strategies focus on helping clients to reduce

their various forms of cognitive distortions, including cognitive errors, automatic thoughts, and dysfunctional attitudes, and by encouraging the resolution of practical problems (Oei & Free, 1995). Coping researchers concur with the important role of coping patterns, stipulating that how individuals cope with stress can amplify or reduce the effects of stressful events (Skinner et al., 2003). As such, cognitive behavioural therapies aim to alleviate symptoms of depression, but also to change the underlying theoretical factors believed to lead to and sustain depression.

As the effectiveness of CBT for depression has been established for quite some time and continues to be supported (Dobson, 1989; Driessen & Hollon, 2010; Lynch, Laws, & McKenna, 2010), researchers are working towards identifying the precise mechanisms through which CBT exerts its successful results (Kazdin, 2007). The identification of change mechanisms is essential because successful treatment should not only provide a temporary relief from symptoms, but provide lasting change through the altering of the theoretical factors believed to lead to and sustain depression. A major contributing factor to this paucity of evidence was articulated by Jacobson and colleagues (1996), who stated that "the absence of an association between treatment condition and target mechanism could have more to do with the inadequacy of currently available measuring instruments" (Jacobson et al., 1996; 2000, p. 303). This problem remains unaddressed, as most research examining cognitive distortions and coping patterns has relied exclusively on the use of self-report measures, which although useful, also poses a number of methodological limitations. Further, the

domains of these measures have been rather narrow, and have not assessed the broad scope of possible distortions or coping patterns. Further research is needed to gain an understanding of precisely how cognitive errors and coping patterns are manifesting in depression, how these variables change over the course of CBT, and the relationship between changes in these variables with recovery from depression.

**Current study**

This dissertation was prepared in accordance with the guidelines of the Faculty of Graduate and Postdoctoral Studies at McGill University. The dissertation comprises two literature reviews, three manuscripts, a bridging section between each of the manuscripts, a conclusion, and a bibliography.

The first literature review delineates the nature of depression, followed by an explanation of the different models of cognitive behavior therapy, with an emphasis on the most common form, that of cognitive therapy. The scientific evidence for the role of distortion in depression is examined, followed by an analysis of changes in distortion over the course of CBT. This is followed by a critique of the available instruments used to assess cognitive distortions, concluding with recommendations for future research.

The second literature review describes what is known about the coping patterns associated with depression, and reviews the literature on change in coping patterns over the course of CBT. A critique of the available coping instruments ensues, concluding with recommendations for future research.

In terms of the three manuscripts, *Study 1* examined the type and frequency of cognitive errors in a sample of clients with Major Depressive Disorder at early therapy. *Study 2* examined how cognitive errors changed from early to late therapy in a sample of clients receiving cognitive therapy for depression. *Study 3* examined the type and frequency of coping patterns used by clients during early therapy, and assessed how coping patterns changed over the course of CT for depression. The relationships between cognitive errors and coping patterns were also examined.

All three studies utilized the same sample of participants, who were drawn from a landmark component analysis study of cognitive therapy for Major Depressive Disorder conducted by Jacobson, Dobson, Truax, and colleagues (1996). In that original study, 150 participants with MDD were randomly assigned to one of three treatment conditions. The current study consisted of 45 clients from the cognitive therapy treatment condition. All participants had been offered 20 sessions of CT, and all therapy sessions were audio-taped. The dissertation involved re-analyzing the data from the CT arm in a new way, using the first known observer-rated measure of cognitive errors, the Cognitive Errors Rating System (CERS; Drapeau, Perry, & Dunkley, 2008), and the first known observer-rated method of coping action patterns, the Coping Action Patterns Rating System (CAPRS; Perry, Drapeau, & Dunkley, 2007). The manuals for these methods define cognitive errors as verbal statements that reflect an anomalous evaluation of material, whereas coping patterns are internally motivated ways of responding to events, and encompass affective, behavioural,

and cognitive components. The validity and reliability of the methods have been established.

**Contribution to existing knowledge**

These studies are unique because they use a new observer-rated measure to assess actual cognitive errors and coping patterns as they occur in session or are reported by clients. As most studies to date have relied upon the use of self-report measures, the current research will examine the phenomena from a different angle. This research will contribute to the field of knowledge by moving beyond the prediction of outcome and associated symptom reduction to examining if change in underlying theoretical factors (cognitive errors and coping patterns) is truly necessary for symptomatic improvement. This is urgently needed to test the assumptions behind one of the most prominent treatment modalities for depression. In examining the effects of any therapy, it is necessary to demonstrate reduction both in symptoms and in the putative risk factors according to the theoretical model of the treatment.

The reader may notice some inevitable redundancies in the text given that manuscripts one through three use data from the same group of participants.

# CHAPTER 1

## Review of Literature Part One:

## Depression, Cognitive Therapy, and Cognitive Errors

### Depression: What is it?

Major Depressive Disorder is a debilitating condition that produces intense personal suffering and a loss of functioning that touches all areas of life (Scott & Sensky, 2003). The prominence of this disorder is quite high, affecting up to 16.2% of adults (Kessler et al., 2003). In addition to core symptoms such as depressed mood, feelings of worthlessness, and loss of energy, depression has been shown to impact physical health (Vandervoort, 1995), social functioning (for a review see Hirschfeld et al., 2000), and ability to function at the workplace (Goldberg & Steury, 2001). In a survey of depression in ten countries, Major Depression was found to correlate with lower family income, being unmarried, and living in an urban area (Andrade et al., 2003). It affects approximately twice as many women as men (Kessler et al., 1994), and is more strongly associated with having an individualistic rather than a collectivist cultural orientation (Sato, 2004).

The etiology of depression is complex, and there is empirical support for both genetic predisposition as well as onset being triggered by stressful life events (Kendler, Karkowski, & Prescott, 1999). Depression is often a recurring condition in both treated and untreated cases. In a review by Belsher and Costello (1988), it was found that following treatment, relapse rates were approximately 20% after a 2-month period of recovery, 30% at 6 months, 40% at 12 months, and

50% at the two year mark. Similarly, in a ten-year follow-up study of depression, it was found that the risk for depression increases by 16% after each subsequent episode (Solomon et al., 2000). Both of these studies indicated that longer periods of recovery were protective against future episodes. Fortunately, successful treatment can reduce the likelihood of relapse/reoccurrence; cognitive behavioral therapy is as efficacious as pharmacotherapy, and more likely to reduce relapse following the discontinuation of treatment (Hollon & Ponniah, 2010).

**Depression: Costs and treatment**

The effects of depression are far-reaching, going beyond the suffering of individuals, to impacting economic domains as well. According to estimates by the World Health Organization, Major Depression will likely become the second most common cause of medical disability worldwide by the year 2020. The costs were estimated at $14.4 billion in Canada, ranking it among one of the most expensive medical conditions (Stephens & Joubert, 2001). An examination of both direct and indirect costs of depression in the workplace, found that the costs of depression could be offset by adequate treatment (Goldberg & Steury (2001).

In Western countries, the most frequently used treatments for depression include antidepressant medications and cognitive behaviour therapy (Parker, Roy, & Eyers, 2003). According to guidelines from the National Institute for Clinical Excellence (NICE; 2009), it is recommended that mild to moderate depression be treated by one or more of the following three options: " Individual guided self-help based on the principles of cognitive behavioural therapy (CBT),

computerised CBT (CCBT), [and/or] a structured group physical activity programme" (NICE, 2009, p. 4). Medication may be indicated for "a past history of moderate or severe depression, or [an] initial presentation of subthreshold depressive symptoms that have been present for a long period (typically at least 2 years), or subthreshold depressive symptoms or mild depression that persist(s) after other interventions" (NICE, 2009, p. 4). Among people experiencing moderate to severe depression, a combination of medication plus CBT or interpersonal therapy is indicated (NICE, 2009).

Psychotherapy is typically more costly than medications during the initial phases of treatment, but is likely to be more cost-effective in the long-term (Tang, DeRubeis, Hollon, Amsterdam, & Sheldon, 2007). A model comparing the cost-effectiveness of 20 sessions of CBT delivered over the course of two years against fluoxetine (with a dosage of 40 mg per day, and management meetings with a psychiatrist every 6 weeks), found that when direct and indirect costs were accounted for, therapy would be less expensive. Specifically, the cost of therapy would be $23,695 US over a two-year period, including $7,268 for direct treatment costs to the provider/patient, $15,174 indirect costs to society, and $1,253 direct costs to the community. This cost for psychotherapy was 30% less than the estimated costs of pharmacotherapy which was $30,733 US over two years, including $12,738 direct treatment costs to the patient/provider, $17,049 indirect costs to society, and $946 direct costs to the community (Antonuccio, Thomas, & Danton, 1997). Despite these costs, the cost of treating depression

may be less expensive than not treating it. For example, from 1990 to 2000, the inflation-adjusted cost of depression in the United States rose from $77.4 billion to $83.1 billion, which represented only a 7% increase despite a 50% increase in treatment rates. Of the $83.1 billion, $5.4 billion (7%) was due to costs associated with suicide, $26.1 billion (31%) with direct medical expenses, and $51.5 billion (62%) with costs in the workplace (Greenberg et al., 2003).

Given the need for cost-effective treatments, 3rd party payers are currently pushing for the use of empirically validated treatments for depression, of which cognitive behavioral therapy is one (Dobson & Khatri, 2000). In fact, both medication and psychotherapy are considered to be effective first-line treatments for depression, and recovery rates hover around 46.4% and 46.3% respectively, which is substantially higher than what it is for control conditions, which hover around 24.4% (Casacalenda, Perry, & Looper, 2002). Similarly, Elkin and colleagues found that approximately 50% of people completely recover from an episode of depression after receiving cognitive therapy (Elkin et al., 1989), and another study found 55% (Ekers, Richards, & Gilbody, 2007). Of the psychological treatments, cognitive behavioural therapy is the most extensively researched, yet the mechanisms through which it produces its successful results are not yet fully understood. Further research in this area is needed so that recovery rates can increase through refinements to the therapy, keeping its essential elements intact, and discarding the unnecessary ones (Kraemer, Wilson, Fairburn, & Agras, 2002).

**Cognitive models of Depression**

The conceptualization of depression bears an important influence on the types of treatment strategies used to overcome it. The three most influential cognitive models of depression have been developed by Seligman, Ellis, and Beck, the latter two of which have been further developed into comprehensive treatments for depression.

Martin Seligman (1972) conducted experiments with dogs wherein he exposed the animals to controllable/escapable and uncontrollable/inescapable shock treatments. He found that after the dogs had been exposed to shock treatments from which they could not escape, two-thirds of these dogs responded in a helpless manner in a subsequent trial that involved escapable shocks. This pattern was not replicated in "naïve" dogs who had not received the inescapable shock training, as only 6% of the naïve dogs displayed helplessness during the escapable shock condition. Seligman hypothesized that this phenomenon, which he termed "learned helplessness", was also the mechanism through which humans could become depressed; that is, as the result of experiencing uncontrollable stress (Seligman, 1972). The learned helplessness theory was reformulated in 1978 on the basis that once noncontingency is perceived, people make attributions about the cause of events. People who attribute the cause of negative events to internal and stable factors, and who extend these factors globally to a generalized life context, are more likely to be depressed than people who make external, specific, and unstable attributions for negative events (Abramson, Seligman, & Teasdale, 1978). Put simply, the learned helplessness model stipulates that experiencing

helplessness leads to thinking one is helpless, which leads to acting helpless, even in situations where this is not the case.

Another cognitive model has been put forth by Albert Ellis, which also focuses on the importance of precipitating events more generally. According to Ellis' model (Ellis, 1980), there is (A) an activating event that threatens people's comfort, followed by (B) an irrational belief that that this *should not* be happening and they *must* not feel this way, resulting in (c) emotional and behavioral consequences. This process leads to secondary symptoms when people evaluate and make meaning of A, B, and C, and feel that the situation and their reactions to it are awful and catastrophic, rather than merely uncomfortable.

A third model has been put forth by Aaron T. Beck and colleagues, who has emphasized a stress-diathesis model of depression (Sacco & Beck, 1995). This model stipulates that as a result of early life experiences, people develop negative schemas about themselves, the world, and the future, known as the cognitive triad. Schemas are relatively tacit, stable "cognitive structures through which events are processed […] they screen, code, categorize, and evaluate stimuli" (Sacco and Beck, 1995, p. 330). Schemas are also involved in the generation of cognitions, which are verbal or visual conscious material (Beck et al., 1979). Acting as filters, schemas enable people to selectively attend to information that fits their schema, and disregard information that does not fit their schema. Schemas serve as the diathesis or predisposition towards depression because they remain latent until a negative experience-similar to the experience that created the schema- reactivates the latent schema. Once the schema becomes

activated, people may start to think in distorted ways, termed cognitive errors (CEs). CEs are relatively unstable "systematic errors in the depressed individual's information processing, which reflect the activity of dysfunctional cognitive schemas" (Sacco and Beck, 1995, p. 330), and are thought to cause and maintain depression (Beck, 1976). The presence of distortions can be inferred from the content of negative automatic thoughts, and from the content of "deeper" dysfunctional beliefs, assumptions, and attitudes (Beck et al., 1979). Although Beck and colleagues do not make any claims about the ultimate cause of depression, the negative schemas and cognitive errors are considered to be the main pathway from which depressive symptoms result and self-perpetuate the condition (Beck et al., 1979).

The cognitive models of depression devised by Beck and Ellis have been developed into therapies, falling under the umbrella of what is called cognitive behavioral therapy (CBT). Cognitive behavioural therapies emphasize that: "1. Cognitive activity affects behavior. 2. Cognitive activity may be monitored and altered. 3. Desired behavior change may be affected through cognitive change" (Dobson & Dozois, 2001, p. 4). Depending on which of these aspects is most emphasized, CBT can be further subdivided into cognitive restructuring therapies, problem-solving therapies, and coping skills therapies (Mahoney & Arnkoff, 1978). However, the literature on CBT is quite convoluted. According to Beck (2005), "The terms [cognitive therapy] (CT) and *cognitive behavioral therapy* (CBT) are frequently used as synonyms to describe CT based on the cognitive model. However, the term CBT is also used to designate a package of techniques

in which a CT module is used in combination with a set of behavioral modules. In addition, CBT has been used as an umbrella term to include both standard CT and the atheoretical combination of cognitive and behavioral strategies…literature reviews generally combine studies labeled CBT and CT under the CBT label" (p. 955).

A critical distinction between Beck's and Ellis' therapies is the basis for cognitive restructuring. Ellis (1980) has stated that his Rational Emotive Therapy (RET), later re-named Rational Emotive Behavior Therapy, differs from other cognitive behavioural therapies in that RET uses "anti*must*urbating" disputation of cognitive distortions that is based on an existential-humanistic philosophy. This is in contrast to the Beckian model that uses empirically-based disputation techniques because it is founded on the realist philosophy that distortions are misperceptions of an objective reality. Ellis cites that instead of viewing depression as an extreme sadness, it could be viewed as a legitimate sadness made extreme by the thought that one *must* not be this sad. As such, it is this secondary appraisal that leads to the depression. For example, Ellis states that while other CBT therapists might encourage a client to think "even though I fail, I am still a good person", he would encourage them to think "I am neither good nor bad, nor can I legitimately rate myself as a total person at all, even though some of my traits are good (efficient) or bad (inefficient) for some of my main purposes" (Ellis, 1980, p. 328). Judith Beck has challenged a similar distortion, presumably by targeting the illogical use of an overarching label, by writing that a distorted

belief could be replaced by the more functional belief "if I fail at work/school, its not a reflection of my whole self" (Beck, 1995, p. 151).

Ellis's theory is less comprehensive than Beck's as it emphasizes only a few key points; people are making themselves depressed by putting too many shoulds and musts onto themselves, and by magnifying their distress rather than tolerating it. Consequently, RET emphasizes "solving the emotional problem about the practical problem--and then (if required) helping the client with the original difficulty" (Ellis, 1980, p. 331), in contrast to Beck's theory which places greater emphasis on challenging distortions as well as solving practical problems. As Beck's cognitive therapy is the most widely researched of the cognitive behavioural therapies, and is the type of therapy that was researched in the three studies that comprise this dissertation, this therapy is the focus for the remainder of this literature review.

**Beck's cognitive therapy for depression**

The development of cognitive therapy began in 1961 when Beck, a psychoanalyst at the time, analyzed the dreams of his depressed clients to test the psychoanalytic theory that depression was "anger turned inward". What he found were themes of self-deprecation, punishment, loss, and deprivation. In 1963 he furthered his analyses by examining the verbal reports and free associations of his depressed clients (Beck, 1963). No longer believing that emotional disturbances were caused by intra-psychic conflicts, as defined in the dynamic tradition, he contended that psychological turmoil resulted from erroneous thinking in the form of irrational beliefs, and misperceptions of oneself and reality (Weissman & Beck,

1978). This led to the development of his cognitive theory of depression, and the development of cognitive therapy in 1979 (Beck et al., 1979). For a review of key concepts, please refer to Table 1.

[Table 1 about here]

According to Beck and colleagues, cognition may be classified according to content, process, and structure (Sacco & Beck, 1995). These distinctions are important because mental disorders may be distinguished from one another on a qualitative basis of thought content and quantitative differences in thought processes. In terms of people with depression, their thought content has been characterized by negative thoughts, particularly of self-blame, low self-esteem, overwhelming duties, and a desire to escape (Beck, 1963). Additionally, the thought processes of depressed people are often conscious, automatic, repetitive, and uncontrollable. As such, depressed thinking has been referred to as containing negative automatic thoughts. While some automatic thoughts may be negatively valenced but realistic, some thoughts are sufficiently negative or unrealistic, to the point that they become distortions of reality.

Beck (1976) initially outlined six different cognitive errors: 1. arbitrary inference (i.e., drawing a conclusion based on insufficient or contradictory evidence), 2. selective abstraction (i.e., focusing on one piece of evidence and not taking the whole picture into account), 3. overgeneralization (i.e., making sweeping conclusions that go far beyond the current situation), 4. magnification (catastophizing) of the negative and/or minimization of the positive (i.e., incorrectly evaluating the degree of severity of a situation), 5. personalizing (i.e.,

believing that external events were caused by oneself when in fact they were not), and 6. absolutistic dichotomous thinking (i.e., seeing things as either all-good or all-bad). In 1999 Burns re-named arbitrary inference as jumping to conclusions and divided it into two types; mind-reading (i.e., assuming and concluding about how others are thinking or feeling without sufficient information), and fortune telling (i.e., believing that a negative outcome will occur). Also re-named were Beck's selective abstraction as mental filter (i.e., focusing extensively on a single negative detail until all reality looks negative), and absolutistic dichotomous thinking as all-or-nothing thinking (i.e., black-and-white thinking such as seeing things as perfect or a total failure). Burns added should statements (i.e., inflexible rules about how the world and/or oneself should be), disqualifying the positive (i.e., not counting positive information as valid), emotional reasoning (i.e., thinking that how one feels represents reality the way it really is), and labelling and mislabelling (i.e., labelling rather than describing an event and giving undue emotional tone to an event). For a list of cognitive errors, please see Appendix A.

In addition to being classified in terms of content or process variables, cognition may be classified in terms of structure. Schemas are hypothetical deep structures which function as filters that help people to categorize, attend to, and screen out information (Sacco & Beck, 1995). The content of schemas is termed core beliefs, which are beliefs about helplessness and unlovability. Intermediate beliefs include dysfunctional attitudes and assumptions, which fall between the level of deep core beliefs and more surface level automatic thoughts (Beck, 1995). Kwon and Oei (1994) have summarized the differences between dysfunctional

attitudes and automatic thoughts in terms of: *stability* (automatic thoughts are unstable and fluctuate with the situation, dysfunctional attitudes are mostly stable), *structure* (automatic thoughts are surface level, dysfunctional attitudes are deeper), *content* (automatic thoughts consist of negative images and thoughts about oneself, the world, and the future, dysfunctional attitudes consist of general, rigid, and unreasonable expectations about life), and *status as a cognition* (automatic thoughts are cognitive products, dysfunctional attitudes reflect schemas or structures). To highlight the difference between automatic thoughts and cognitive errors, it has been stated that "cognitive errors [are] a cognitive process that does not consist of content, [and they] contribute to the transformation of dysfunctional attitudes and environmental events into automatic negative thoughts" (Kwon & Oei, 1994, p. 334).

**A key assumption in cognitive therapy for Depression: Depressed thinking is distorted**

As the fundamental assumption of cognitive theory is that problematic cognitions and schemas are inaccurate, cognitive therapy (CT) is geared towards identifying and correcting both the distorted cognitions and the underlying schemas. The therapy is based on three main assumptions: 1) the way that people view the world affects how they feel and behave, 2) cognitions (beliefs, thoughts, fantasies, and images) are not unconscious, and can be monitored, and 3) the altering of these cognitions will lead to changes in behaviours and feelings (Beck et al., 1979).

Beck's CT is manualized, and therapists are trained to take an active, directive, structured approach to therapy. Psycho-education is taught, and homework activities are assigned (Beck et al., 1979). Behavioural techniques are often used before cognitive techniques, and manifest as weekly homework assignments that are geared towards activities such as approximating concrete goals, or monitoring satisfaction with activities. As cognitions are thought to be relatively conscious, therapy focuses on "here and now" problems, with little attention to unconscious or past material (Beck et al., 1979). In therapy, clients also learn how to become more aware of their thoughts through self-monitoring activities, to assess the accuracy of these thoughts, to understand the connections between thoughts, feelings, and behaviours, to exchange the distorted thoughts for more realistic ones, and to identify and change the underlying schemas. Cognitive restructuring starts by first targeting automatic thoughts and later moves to targeting dysfunctional attitudes (Jacobson, Dobson, Truax, Addis, et al., 1996). In fact, many of the behavioural strategies are aimed at creating cognitive changes. For example, behavioural experiments are designed to test the accuracy of dysfunctional beliefs (Beck et al., 1979).

Time in therapy spent on identifying automatic thoughts and cognitive errors helps the therapist to conceptualize the client's underlying schemas or dysfunctional attitudes (Safran, Vallis, Segal, & Shaw, 1986). While modification of peripheral cognitions may provide a client with temporary relief, a therapeutic focus on changing the underlying central cognitive processes is thought to be important and required for more lasting change (Guidano & Liotti,

1983). However, this notion has been challenged by the results obtained in a component analysis study of CT by Jacobson and colleagues (1996). These researchers found that the full CT package, which included behavioural interventions as well as restructuring automatic thoughts and core beliefs, did not provide any additional treatment benefits beyond what was obtained by the other two groups, who received either behavioural activation only or behavioural activation plus automatic thoughts restructuring.

**Research findings for the role of distortion in Depression**

Research has long established a correlation between the presence of cognitive distortions and symptoms of depression. Automatic thoughts have been found to significantly correlate with depression in children (e.g., Kazdin, 1990), undergraduates (e.g., Dobson & Breiter, 1983; Hollon & Kendall, 1980), and adults (Harrell & Ryon, 1983), and similar results have been found for dysfunctional attitudes (e.g., Dobson & Breiter, 1983), and cognitive errors (e.g., Hammen, 1978; Lefebvre, 1981; Sato, 2004; Smith, Peck, Milano, & Ward, 1988). Further support for the relationship between distortion and depression comes from findings indicating that adults with depression have higher levels of cognitive errors (e.g., Krantz & Hammen, 1979; Krantz & Lui, 1987; Lefebvre, 1981; Michael & Funabiki, 1985; Norman, Miller, & Klee, 1983), automatic thoughts (e.g., Harrell & Ryon, 1983; Hollon & Kendall, 1980), or dysfunctional attitudes (e.g., Dobson & Shaw, 1986; Hamilton & Abramson, 1983; Hollon, Kendall, & Lumry, 1986) than non-depressed controls. Very little research has

been done to examine the relationship between specific CEs and depression, but a few findings are presented.

**Fortune telling.** Miranda and Mennin (2007) conducted a study whereby university students completed a measure of depression, the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a measure that assessed symptoms of generalized anxiety disorder, The Generalized Anxiety Disorder Questionnaire-IV (Newman et al., 2002), and the Future Events Tasks. The Future Events Tasks was adapted for the study, and is a self-report questionnaire that lists positive and negative events, and asks participants if they thought the event would happen to them in the future, as well as the degree to which they held that conviction. An example of a positive event would be "have a successful career" and an example of a negative event would be "have family disapprove of life choices". These events were chosen based on face validity, and were adapted from previous studies (Andersen, 1990; Andersen & Limpert, 2001; Andersen, Spielman, & Bargh, 1992; MacLeod, Byrne, & Valentine, 1996; MacLeod, Williams, & Bekerian, 1991; Miranda & Andersen, 2006). Miranda and Mennin (2007) found that depression and anxiety scores were correlated with endorsing "yes" to negative items, but that only depression scores were correlated with endorsing "no" to positive items. The same pattern was found for degree of certainty; the higher the depression or anxiety score, the more certain they were that the negative events would happen to them, and only the degree of depressive symptoms was related to thinking that positive events would not happen to them. A strength of this study was that it assessed the certainty of convictions, but there

was no way to assess if the participants had been thinking about those negative or positive events prior to reading about them on the questionnaire.

Hammen and Krantz (1976) asked dysphoric and non-dysphoric female undergraduate psychology students to assess their potential ability to be an effective therapist. Participants then completed a task which appeared to measure their potential to be a good therapist, and were subsequently given bogus negative feedback about their performance before being asked to re-rate their potential to be a good therapist. Prior to the feedback, both groups did not differ in their assessments of their future performance, but after receiving bogus negative feedback about their future abilities, only the dysphoric group made more negative future predictions.

**Magnification/minimization.** Dysphoric and non-dysphoric college students (assessed using the short form of the Beck Depression Inventory (BD1-SF; Beck & Beck, 1972), were given bogus success or failure feedback on a test of social perceptiveness. Consistent with Beck's theory of depression, dysphoric participants rated social perceptiveness to be more important when they "failed" on the task, while non-dysphoric students rated the task to be more important when they "succeeded" on the task. However, this does not necessarily illustrate an "error" as different from *reality* (i.e., an unrealistic alteration of score), but just in comparison to controls. However, dysphoric participants also did not minimize the importance of their success on social perceptiveness (relative to controls) as Beck's theory states that they would (Wenzlaff & Grozier, 1988).

**Overgeneralizing** Evidence of overgneralizing was seen in dysphoric participants because both dysphoric and non-dysphoric individuals lowered their estimates of social perceptiveness after receiving negative feedback, but only dysphoric participants lowered their ratings in proficiency judgments as well (Wenzlaff & Grozier, 1988). In a different study on response to negative feedback, Hammen and Krantz (1976) gave dysphoric and non-dysphoric female undergraduates bogus feedback about their potential skills as a therapist. After receiving the negative feedback, only the dysphoric participants became more negative in their self-evaluations of personal qualities.

Despite these findings, a challenge to the notion that depression is characterized by distorted thinking has been presented by two bodies of research; research into depressive realism, and research into individual differences in the form of comparing "high" vs. "low" distorters.

**Challenges to the distortion paradigm:**

**Depressive ealism and individual differences**

Research into a phenomenon termed depressive realism has typically used contingency tasks to assess the degree to which participants believe they have control over their environment. During contingency tasks, participants are encouraged to perform an action (e.g., push a button), and assess the degree to which they are responsible for producing an outcome (e.g., a light bulb becoming illuminated). In zero-contingency tasks, there is no relationship between pushing the button and the light bulb illuminating. Contextual information that may influence the *perception* of control over the light bulb is inter-trial interval length

(e.g., 3 vs. 15 seconds), or total frequency of positive outcomes (e.g., a light bulb illuminating 25% vs. 75% of the time that a button is pressed; Msetfi, Murphy, Simpson, & Kornbrot, 2005). Research into depressive realism began in 1979 with Alloy and Abramson. Based on findings from their zero-contingency tasks, they concluded that depressed people might be "sadder but wiser" than their non-depressed counterparts who mistakenly believed that they had control over the light bulb. A number of researchers have since investigated this phenomenon because of its implications for the treatment of depression. Namely, is cognitive therapy successful at treating depression because it encourages clients to accurately perceive themselves and the world, or because it encourages the positive distortions of increased control over situations that the non-depressed possess? (Ackermann & DeRubeis, 1991). There is a body of work that suggests non-depressed people have positive illusions that enhance their wellbeing (see Taylor & Brown, 1988 for a review).

According to a review by Ackermann and DeRubeis (1991), there are an approximately equal number of studies for and against the depressive realism hypothesis. Reasons for the inconsistent findings are that the depressive realism hypothesis might only be true at low levels of depression (McKendree-Smith & Scogin, 2000), that experimental results are dependent on the type of task administered, that experiments are measuring the phenomenon inaccurately (Ackermann & DeRubeis, 1991), that the findings are based on chance and therefore not repeatable, that laboratory procedures do not generalize to real-world conditions, and that the participants were not actually depressed because

their "depression" was assessed using self-report measures (Haaga & Beck, 1995).

However, the results from a recent study by Msetfi, Murphy, Simpson, and Kornbrot (2005) found that the depressive realism is actually consistent with Beck's cognitive distortion theory of depression. In a series of two experiments, depressed participants were found to consistently underestimate their degree of control over a light bulb, even when contextual cues (i.e., inter-trial interval time and positive outcome density) should have increased their perceptions of control as it did for non-depressed participants. Though the experiments used zero-contingency tasks, the depressed group's underestimations of control were viewed to be accounted for by a lack of ability to integrate all available contextual information, rather than a tendency to make more negative but accurate guesses, which is consistent with a CBT view of depression. Finally, Coyne and Gotlib (1983) state that a distortion is a "cognition that persists in the face of strong evidence to the contrary" (p. 496), and that "it cannot be argued that differences between depressed and nondepressed individuals in attributions for laboratory task outcomes represent depressive distortions or errors, unless one wishes to make assumptions that depressed persons *should* be able to perceive that outcomes are bogus and controlled by the experimenter" (p. 496).

**Individual differences in distortion tendencies**

While existing research based largely on group means would suggest that an elevated level of cognitive distortion is a defining feature of depression, other

researchers have examined nuanced differences between depressed participants that they have classified as low and high distorters. For example, Norman, Miller, and Klee (1983), examined 90 inpatients (30 people with primary[1] depression, 30 with secondary[2] depression, and 30 non-depressed psychiatric patients), who they classified as high or low distorters based on their scores on the Cognitive Bias Questionnaire (Krantz & Hammen, 1979). No differences were found between high and low distorters on demographic variables. However, on the Beck Depression Inventory[3] (BDI) indexes, high distorters were found to be higher on total score, guilt, and motor retardation. This pattern was replicated on the Present State Exam (Wing, Cooper, & Sartorius, 1974), where high distorters were found to score higher on the cognitive index (e.g., self-blame, hopelessness, suicidality, guilty ideas of reference). Results of this study suggest that there may be a relationship between higher levels of distortion and a greater severity of depressive symptoms.

Interestingly, there does not seem to be a consistent relationship between the presence of stressful events and levels of distortion. For example, one study

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[1] Primary depression was defined as: (a) meeting criteria for a diagnosis of primary affective disorder on the Research Diagnostic Criteria (Spitzer, Endicott, & Robins., 1978), (b) absence of a prior manic episode, (c) the patient's psychiatrist considered the depression to be a major problem for the patient on the Problem Oriented Medical Record (Weed, 1970) and (d) a score of 18 or higher on the Beck Depression Inventory (Beck, 1967).

[2] Secondary depression was defined as: (a) meeting criteria for a diagnosis of secondary affective disorder with alcoholism on the RDC (Spitzer, Endicott, & Robins, 1978), (b) depression identified on the POMR (Weed, 1970), and (c) a score of 18 or higher on the BDI (Beck, 1967).

[3] Note, Norman, Miller, and Klee (1983), did not specify which version of the Beck Depression Inventory they used. However, this scale comes in two versions: Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; and BDI-II; Beck, Rush, Shaw, & Emery, 1979).

found that participants with only a minimal amount of stressful life events had higher rates of cognitive distortion than did participants with higher amounts of stress (Hammen, 1978). In another study of depressed participants, Michael and Funabiki (1985), found that participants with low and high stress levels did not differ from one another in how much they distorted, and both groups distorted more than people with moderate life stress levels. Together these findings suggest that some people are more prone to the production of cognitive distortions, independent of environmental events, perhaps suggesting that there may be certain subtypes of depression; realistic vs. distorted.

Do distortion tendencies impact how much an individual can benefit from receiving CBT? From a theoretical standpoint, it might seem likely that people high on cognitive distortion would be ideal candidates for a therapy aimed at restructuring distorted cognitions, yet some research has indicated that people with lower levels of cognitive distortions have actually responded better (e.g., Jarrett, Eaves, Brannemann, & Rush, 1991; Keller, 1983; Sotsky et al, 1991). However, it could be argued that people high on cognitive distortion just needed more time in therapy to achieve similar results, which could be addressed in a naturalistic setting not bound to the constraints of manualized treatment protocols.

Conversely, another study found that participants who had experienced a negative life event but possessed few dysfunctional attitudes had the poorer therapy outcomes than did participants with high scores on the Dysfunctional Attitudes Scale (DAS; Weissman, 1979) and the presence of a negative life

event[4], or a low score on the DAS with no negative life event. These researchers concluded that their findings may indicate that people with negative life experiences who had low DAS scores were relatively realistic about their situation and may not have benefited from a therapy aimed at correcting unrealistic ideas (Simons, Gordon, Monroe, & Thase, 1995). Overall, results seem inconclusive regarding the relationship between level of cognitive distortion and success in CBT, perhaps because the therapy also emphasizes coping with practical problems, in additional to a focus on cognitive restructuring.

**Changes in cognitive distortion over the course of CBT**

Despite these theoretical questions about who is likely to benefit most from CBT, clear support for the efficacy of CBT has been shown in a number of studies (e.g., Butler, Chapman, Forman, & Beck, 2006; Dobson, 1989; Oei & Free, 1995), and cognitive changes have consistently correlated with recovery from depression (e.g., DeRubeis et al., 1990; Furlong & Oei, 2002; Oei & Shuttlewood, 1997; Oei & Sullivan, 1999). Specifically, automatic thoughts have been found to change sooner than dysfunctional attitudes (Furlong & Oei, 2002) and to be more highly correlated with changes in depression (Oei & Free, 1995), findings that are consistent with the tenets of Beck's cognitive theory (Beck et al., 1979).

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[4] Presence of a negative life event was determined using the Bedford College Life Events and Difficulties Schedule (LEDS; Brown & Harris, 1978) and a modified version of the Psychiatric Epidemiology Research Interview (PERI) Life Events Scale (Dohrenwend, Krasnoff, Askensasy, & Dohrenwend, 1978)

Cognitive behavior therapy has also been found to restore levels of cognitive distortion back to "normal" levels (Kwon & Oei, 2003). For example, Oei and Sullivan (1999) examined the data of 67 participants who had received 12 weeks of group CBT for depression. These researchers found that recovered participants had lower levels of automatic thoughts than did participants who did not recover, and that the rate at which their automatic thoughts decreased was also faster. This finding was not replicated for dysfunctional attitudes, which were found not to differ between recovered and non-recovered individuals. However, participants who recovered had greater change in dysfunctional attitudes than those who did not, and both groups demonstrated increased rate of change after week 6, which is consistent with Beck's theory that attitudes are deeper and thus slower to change.

**Change mechanisms in CBT**

Although cognitive behavioural therapy purports to treat depression by targeting erroneous cognitions, Longmore and Worrell (2007) state that it cannot be assumed that cognitive interventions actually target cognitive structures, or that behavioural interventions (for example) do not target underlying cognitions. It needs to be shown directly that changes in cognitions are actually mechanisms; that they mediate changes between therapy and depression. However, there is little empirical evidence to support the theoretical assumption that targeting cognitions is in fact the mechanism responsible for reduction in depressive symptoms (Oei, Bullbeck, & Campbell, 2006).

Mechanism research has been reviewed in terms of the following four domains: 1. Do CEs change more in CBT vs. other therapies, 2. Statistical evidence for mediation using statistical models, 3. Evidence based on the timing of change (one component of mediation), and 4. Cognitive changes and relation to rate of relapse and prevention of relapse.

**1. Do CEs change more in CBT vs. other therapies?** If CBT works by altering cognitions, it should follow that participants receiving CBT will show a greater reduction in distorted cognitions than participants receiving other treatments, particularly pharmacotherapy (as opposed to other talk therapies) because this eliminates potentially confounding effects of common factors (Garratt, Ingram, Rand, & Sawalani, 2007). A review by Rush and colleagues found that when comparing CBT to pharmacotherapy for depression, only in the CBT group did participants show improvements in mood, hopelessness, and views of the self, before vegetative and motivational symptoms decreased (Rush, Kovacs, Beck, Weissenburger, & Hollon ,1981). There were no consistent change patterns in the medicated group. This was an initial way of explaining the important role of cognitive change mechanisms. Later studies found that CBT improved cognitive aspects of depression while behavior therapy did not (McNamara & Horan, 1986), and that CBT plus pharmacotherapy significantly decreased dysfunctional cognitions in depressed participants who were high on levels of cognitive distortion while pharmacotherapy alone did not (Miller, Norman, & Keitner, 1990). Similar results were found for a sample of adolescents, as CBT was found to have significantly more impact on decreasing

cognitive errors than did non-directive supportive therapy and systemic-behavioral family therapy (Kolko, Brent, Baugher, Bridge, & Birmaher, 2000).

However, several studies do not support the notion that more cognitive changes occur in CBT as compared to other therapies (e.g., Imber et al., 1990; Zeiss, Lewinsohn, & Munoz, 1979). In their meta-analysis, Oei and Free (1995) found that maladaptive cognitions decreased across all treatments: CBT, pharmacotherapy, other-psychological therapy, and even wait-list control. Although all active treatments were superior to the wait-list condition, there were no differences between the active treatments, meaning that CBT did not show a superior ability to reduce maladaptive cognitions.

A second meta-analysis was conducted by Gloaguen, Cottraux, Cucherat, and Blackburn (1998). Forty-eight (48) clinical trials of cognitive therapy were examined, and it was concluded that CT was superior to control conditions (placebo and wait-list) and anti-depressant medication, but equal to behavior therapy. They stated that as cognitive therapy contains behavioural elements such as activity scheduling and skills training, and behavior therapy includes cognitive techniques such as disputation of non-helpful self-talk, they could not support the role of cognitive modification in the superiority of cognitive therapy. However, they also stated that "we found a superiority of CT over other therapies suggesting that therapies without strong behavioural and/or cognitive components may be less active in depression" (p. 69).

In 2003, a study by Watson, Gordon, Stermac, Kalogerakos, and Steckley compared process-experiential to cognitive-behaviour therapy for depression and

found no difference between groups on depression level and level of dysfunctional attitudes after 16 weeks of therapy. Similarly, Tang, DeRubeis, Beberman, and Pham (2005) assessed cognitive change in participants from the Jacobson and colleagues 1996 component study using the Patient Cognitive Change Scale (PCCS; Tang & DeRubeis, 1999a). The Jacobson data involved three treatment conditions: Behavioural activation (the BA condition), behavioral activation plus work on automatic thoughts (AT condition), and a full CT condition that included the previous elements, plus work on identifying and modifying core schemas. Raters listened to audio-taped therapy sessions from those three treatment arms, and coded seven possible cognitive changes: "(a) bringing a belief into awareness, (b) identifying an error in cognitive process or belief, (c) arriving at a new belief on a specific issue, (d) bringing a schema into awareness, (e) identifying an error in a schema, (f) arriving at a new schema, and (g) accepting a new cognitive technique" (p. 899). They also coded how significant the change was for the participant from one "a possible/potential cognitive change" to four "a cognitive change with extraordinary personal significance". Despite what would be expected from a theoretical standpoint, no differences in amount of cognitive change were found between the three treatment groups.

Some studies have found mixed results for changes in cognitive variables. For example, DeRubeis and colleagues (1990) compared CBT to pharmacotherapy, and found that midway through the treatments both groups had significantly reduced scores on the Attributional Style Questionnaire (Seligman,

Abramson, Semmel, & von Baeyer, 1979), the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978), and the Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974). However, dysfunctional attitudes were found to be related to changes in depressive symptomatology only in the CBT group but not in the pharmacotherapy group.

In another study, outpatients with mild to moderate depression were randomized into three groups: Standard CBT, computer–assisted CBT, and wait-list control. Results indicated that at the end of treatment there were no differences in improvement between the standard CBT group and the wait-list control group on dysfunctional attitudes. Only the computer-assisted CBT group showed significant improvement in dysfunctional attitudes compared to controls (Wright et al., 2005).

A study by Oei, Bullbeck, and Campbell (2006), also found mixed results using the Dysfunctional Attitudes Scale (DAS; Weismann & Beck, 1978). They found that dysfunctional attitude scores changed from pre-therapy to mid-point, but they did not decrease from midpoint ($7^{th}$ week) to the end (session 12). In yet another study, patients were assigned to receive either standard inpatient treatment (pharmacotherapy and milieu management) or standard inpatient treatment (pharmacotherapy and milieu management) plus CT. Within group comparisons on four cognitive measures, from pre-treatment to post-treatment, indicated that both groups reported fewer cognitive distortions on the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) and Hopelessness Scale (HS;

Beck, Weissman, Lester, & Trexler, 1974), but not on the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978) or Cognitive Bias Questionnaire (CBQ; Krantz & Hammen, 1979; Norman, Miller, & Klee, 1983). However, between group differences indicated that the CBT group was less hopeless and had fewer cognitive distortions at posttreament than the non-CBT group (Whisman, Miller, Norman, & Keitner, 1991). One limitation of this study is that the administration of medications often involves clinical management, and this could be contributing some unknown quantity of common factor variance.

Overall, the evidence surrounding whether or not more cognitive changes occur in CBT than in other type of therapy remains inconclusive; a review by Whisman (1993) found that roughly two out of three studies demonstrated evidence of greater cognitive change occurring in CBT, but it often depends on the instrument used to assess cognitive change.

Mixed results might have been obtained for a number of reasons. CBT may work differently for different people even within CBT itself because some people think in distorted ways about actual negative events, and others have distorted thinking in the absence of negative events, which might be a deeper, harder to change problem (Simons et al., 1995). Alternatively, treatments may have specific mechanisms through which they affect change in cognitive variables. As such, different therapies might employ different mechanisms, but achieve similar results on outcome variables (Hollon, DeRubeis, & Evans, 1987). For example, even though CBT and pharmacotherapy have different mechanisms of action, both have an effect on information-processing systems, which leads to

simultaneous change trajectories on cognitive and vegetative symptoms, which is consistent with Beck's theory that cognitive and vegetative symptoms are different levels of the same information-processing system (Bhar et al., 2008). Finally, mixed results might be a function of measurement error. In a meta-analysis by Oei and Free (1995), it was found that change in depression on the Beck Depression Inventory (Beck, Steer, & Garbin, 1988) was associated with change in cognitive style in both CBT and other psychological therapies, but not for drug therapy or wait-list control. A pattern that was not replicated using the Hamilton Rating Scale for Depression[5] probably because there are more cognitive items on the Beck Depression Inventory.

**2. Evidence for the role of cognitive mediation using statistical models.** "A variable is considered to be a mediator when change in the mediator, such as DAS, both precedes and correlates with change in the dependent variable" (Floyd & Scogin, 1998, p. 460). If evidence of cognitive mediation is not found in CBT, it does not mean that CBT is ineffective, just that the effects could be the result of common factors, rather than CBT-specific factors (Floyd & Scogin, 1998). Tang and DeReubis (1999a) state that the influence of the alliance is not independent from the influence of cognitive changes because "...cognitive techniques and therapeutic alliance are likely the long-term causes of the cognitive changes and sudden gains" (p. 902).

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[5] Oei and Free (1995) did not specify which versions of the Hamilton Rating Scale for Depression were used. The most common versions contain 17-items (Hamilton, 1960), 21-items (Hamilton, 1960), or 24-items (Guy, 1976).

DeRubeis and colleagues (1990) found that greater change in dysfunctional attitudes was related to greater change in depressive symptoms and that this mediated the relationship between CBT and depressed mood. Similarly, Kwon and Oei (1992) found that automatic thoughts mediated the relationship between negative life events and depression. However, contrary to these results are those obtained by Kolko and colleagues, who found that changes in CEs did not mediate the outcome in depression level in adolescents (Kolko, Brent, Baugher, Bridge, & Birmaher, 2000), and those by Floyd and Scogin (1998), who did not find evidence of cognitive mediation in a sample of older adults. However, as Floyd and Scogin (1998) stated that DAS scores did not change significantly from pre to post treatment, lack of support for cognitive mediation could be a statistical problem due to a small range of scores. This may indicate that cognitive mediation might not play a factor for older adults (who have had more time to firmly ingrain their attitudes), but still could for younger ones.

Mixed evidence for the role of mediation comes from a study by Quilty, McBride, and Bagby (2008) who used structural equation modeling to test cognitive mediation models in CBT. When comparing participants who received CBT against those who had received interpersonal therapy, the cognitive mediation model was a better fit for the data than was the 'complication model'- the complication model being that change in depression leads to decreases in dysfunctional attitudes. However, when comparing CBT to pharmacotherapy, the opposite results were found (i.e., the complication model was a better fit than the mediation model). These finding do not necessarily discredit the mediation model

in CBT for two reasons. First, evidence of cognitive change in a non-CBT therapy could indicate that cognitive changes were a by-product rather than a mediator in that non-CBT therapy. This would not discredit the role of cognitive mediation in CBT, but could indicate that cognitive variables are mediators in CBT, and only by-products in other therapies. Secondly, the observed decrease in dysfunctional attitudes may have been caused by *lasting* cognitive changes in CBT, as opposed to only being *deactivated* in pharmacotherapy.

**3. Evidence based on timing of cognitive changes (one component of mediation).** Timing studies can be grouped according to the type of hypotheses (based on Beck's CT tenets) that they seek to test. Oei, Bullbeck, and Campbell (2006) have summarized the following hypotheses: 1. The *causal cognition model* of depression, which states that automatic thoughts and dysfunctional attitudes cause and maintain depression. As such, therapy should focus on the restructuring of these in order to bring relief from depression. The next model is the *consequential cognitive model*, which is opposite to the first model, in that it purports that change in depressive symptoms (caused by some unknown factor in therapy) is what reduces automatic thoughts and dysfunctional attitudes.

In 1999, Tang and DeRubeis found that a number of participants experienced sudden drops in their BDI scores from one session to the next, so they examined the sessions prior to the decrease (the pre-gain session) using the Patient Cognitive Change Scale (PCCS; Tang & DeRubeis, 1999a). The PCCS is an observer-rated scale to assess cognitive changes using audio-taped therapy sessions, with an interrater reliability of only .5. These researchers examined the

sessions prior to the pre-gain session (the control sessions), and found that more substantial cognitive changes were found in the pre-gain sessions than in control sessions, and that sudden gains predicted good outcomes in depression. They concluded that the cognitive changes might have led to the decreased depression, that sudden gains may cause an "upward spiral" with greater cognitive change, improved alliance, and a decrease in depressive symptoms, all interacting with one another (Tang & DeRubeis, 1999a). This study was the first to examine actual *in-session* processes.

One challenge to the sudden gains literature is that sudden gains have been found to occur at the same frequency in pill placebo and pharmacotherapy treatments (Vittengl, Clark, & Jarrett, 2005). Therefore, sudden gains could be interpreted as noise or regular treatment variability. However, Tang, DeRubeis, Hollon, Amsterdam, and Sheldon (2007) also found that sudden gainers were less depressed than non-sudden gainers at 6 and 18 months follow-up, suggesting that sudden gains are not merely noise in the data. Unfortunately, antidepressant and pill placebo groups were not assessed frequently enough to check for the presence of sudden gains. Thus, they concluded that sudden gains might be caused by participant characteristics, therapist characteristics, or therapy process variables.

After reviewing the sudden gains literature, Hardy and colleagues (2005) concluded that as sudden gains have been found to occur across many therapies, including those that do not target cognitions, another process may be at work. As such, they suggested that Stiles' 1990 pan-theoretical assimilation model could account for the sudden gains seen across the different therapies. According to this

model, there is a "developmental sequence through which clients' problematic experiences pass on their way to becoming assimilated and suggests that the greatest improvement in clients' affective states is expected across a relatively restricted portion of this sequence" (p. 66). As such, the appearance of sudden gains is actually just catching people in a narrow part of a larger, more complex process.

Another threat to the causal model comes from a study conducted by Oei, Bullbeck, and Campbell (2006). In a 12-session group CBT for 168 depressed outpatients, it was found that a reduction in depressive symptoms led to a reduction in automatic thoughts and dysfunctional attitudes rather than the other way around. This was counter to CBT theory which states that it is a reduction in automatic thoughts and dysfunctional attitudes that leads to a reduction in depression. As their symptom model accounted for 30% of the treatment variance, these researchers concluded that "the cognitive component of therapy may not be the primary change agent in reducing depressed symptoms" (Oei, Bullbeck, & Campbell, 2006, p. 240).

**4. Cognitive change as related to rate of relapse and prevention of relapse.** Cognitive behavioural therapy has lower relapse rates than pharmacotherapy, but the mechanisms for this are not yet known (Tang, DeRubeis, Hollon, Amsterdam, & Shelton, 2007). For example, a study by Fava, Rafanelli, Grandi, Conti, and Belluardo (1998) examined 40 participants who received pharmacotherapy for depression, who were later tapered off their medications as they received either clinical management or CBT for residual

symptoms. The CBT group was found to have lower rates of depression at termination of pharmacotherapy as well as significantly lower rates of relapse (25% compared to 80%). One reason for this finding might be that CBT acts as a buffer against future episodes by helping people to reduce their emotional reactivity. Segal, Gemar, and Williams (1999) performed a study where they examined the effects of a negative mood induction on formerly depressed participants who had previously received either CBT or pharmacotherapy. At baseline, participants did not differ in their level of dysfunctional attitudes, but after the sad mood induction, the CBT group endorsed fewer dysfunctional attitudes, suggesting that CBT had greater effects on reducing cognitive reactivity.

Rush, Weissenburger, and Eaves (1986) examined a sample of 15 women who were successfully treated with CBT for depression. They found that higher levels of dysfunctional attitudes present 2-3 weeks after therapy termination (T2) was positively correlated with depressive symptoms at 6 month follow-up (T3). This was a stronger predictor than level of depression at T2, as depression at T2 was not significantly related to depression at T3. This pattern of results was not found for the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) or the failure composite subscale of the Attributional Style Questionnaire (ASQ; Seligman, Abramson,Semmel, &von Baeyer, 1979). A similar pattern of results was found by Simons, Murphy, Levine, and Wetzel (1984), who found that of the people who were remitted for depression who had elevated levels of dysfunctional attitudes were likely to relapse within 6 months to a year after therapy

termination. This pattern supports the idea that underlying cognitive changes need to be made to prevent relapse.

**Summary of research on change mechanisms**

The evidence for change mechanisms in CBT has been recently summarized by Quilty, McBride, and Bagby (2008) who stated: "Although empirical support for the efficacy of cognitive therapy as a treatment for major depressive disorder (MDD) is well-established, its mechanism of action in much less certain" (p. 1531). Kuyken and colleagues (2007) similarly stated that "the jury is out on what mediates change in CBT, and further process-outcome evidence is required to reach a verdict" (p. 9). In addition to the lack of process studies, the paucity of evidence could also be a result of the fact that change mechanisms are simply difficult to measure, as evidenced by Hollon, DeRubeis, and Evans' (1987) assertion that underlying variables (i.e., mechanisms) might become deactivated or suppressed, or supplemented by more adaptive coping strategies, which would make their assessment increasing difficult.

**Limitations of the change mechanisms research**

Research in the domain of change mechanisms is challenging because depressive symptoms and the mechanisms thought to reduce symptoms are usually intertwined, reciprocally caused, or even impossible to separate (DeRubeis et al., 1990). Some limitations of existing studies are related to the fact that while CBT is manualized, a number of variables are inconsistent across studies. For example, CBT session length has been found to vary in studies from 30 minutes to two hours, total number of sessions varied from five to 46, and

many studies do not even specify the number of sessions given (Oei and Free, 1995). The frequency of sessions per week also varied, as did format (individual vs. group). Some sampling limitations are that participants are often university samples who are insufficiently diagnosed as depressed using only the BDI in lieu of a clinical screening (e.g., Michael & Funabiki, 1985; Wenzlaff & Grozier, 1988), that chronicity of depression is not always indicated (e.g., Simons et al., 1995), and that conclusions are drawn on the basis of induction of a slightly depressed mood as opposed to actual depression (e.g., Henriques & Leitenberg, 2002).

Smith (1982) stated that measures of cognition might not actually be measuring cognition, but might just be a measure of depression, maladjustment, or emotional distress, which is compounded by the fact that there is a lack of standardization of instruments (Oei & Free, 1995). As such, the most commonly used measures of distortion will now be reviewed.

**An examination of commonly used instruments assessing cognitive distortion**

As research findings are only as reliable as the tools used to measure the constructs, below is a review of the key instruments that measure cognitive distortion.

**1. Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978).** The DAS is a self-report measure of dysfunctional attitudes and depressive schemas, designed to reflect negative thoughts about the self, world, and future as per Beck's theory of depression. Items are scored on a 7 point Likert scale from

"*totally agree*" to "*totally disagree*". The original 100 items were written by Weissman, who gave it to psychiatry residents to evaluate it for face validity and comprehensiveness. After revisions were made, it was presented to 25 graduate students in an educational psychology course. As they felt it took too long to administer, a factor analysis was completed based on scores from 275 undergraduate students. Based on factor loadings, two parallel 40-items versions were kept; the DAS-A and DAS-B, which are used in lieu of the longer version (Weissman & Beck, 1978). Sufficient psychometric properties have been obtained; test-retest reliability ranges from .79 - .86; and internal consistency from .79 - .93 (Dobson & Shaw, 1986).

**2. Cognitive Bias Questionnaire (CBQ; Krantz & Hammen, 1979***).*

The CBQ comprises six stories of problematic college situations, followed by three or four multiple-choice questions that ask respondents to select the answer that best represents how they would think about that situation if it happened to them. Each question is followed by four possible response options: One depressed-distorted thought, one depressed-nondistorted thought, one nondepressed-distorted thought, or one nondepressed-nondistorted thought. The authors state that "the dimension of depressed versus nondepressed tone as used in this questionnaire refers to the presence or absence of unhappiness and dysphoria and not to the clinical disorder with its associated severely painful feelings. The distorted versus nondistorted dimension denotes the presence or absence of interpretations that are unwarranted in light of the available information" (p. 612). The authors aimed to create distorted thoughts that would

capture the cognitive errors of arbitrary inference, overgeneralization, selective abstraction, and maximization of negative and minimization of the positive, but as independent judges were unable to identify which particular cognitive error was being captured, responses were deemed to reflect some unidentified type of distortion outlined by Beck. The questionnaire was tested on six different samples, including college students, depressed outpatients, and depressed inpatients (please see Krantz & Hammen, 1979 for further sampling details), and in all cases, the relatively more depressed participants had significantly higher depressed-distorted scores. The questionnaire was also found to have moderate internal consistency.

**3. Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980).** The ATQ was developed by asking 788 undergraduates to think of a depressing experience in their lives, and to recreate it in their minds as vividly as possible. They were then to write down any thoughts that "popped into their head". After redundant and incomprehensible items were removed, 100 items remained. This was the first ATQ-100. In their second study, 312 undergraduates (female and male) were divided into 2 groups. The first group was used to select the items, and the second group was used for cross-validation. Both groups completed the Beck Depression Inventory and the Minnesota Multiphasic Personality Inventory-Depression (Hathaway & McKinley, 1940), and the State-Trait Anxiety Inventory (STAI) A-Trait scale (Spielberger, Gorsuch, & Lushene, 1970). The samples were very small; there were only 12 depressed and 20 non-depressed in the item group, and 14 depressed and 21 non-depressed in the cross-

validation sample. Thirty items were kept on the basis that they differentiated between depressed and non-depressed individuals in the item sample. In the cross validation sample, the mean for the depression group was larger than the mean for the non-depressed group for the 30-item test. A limitation was that the ATQ-30 correlated very highly with anxiety as measured using the STAI A-Trait ($r$ = .79 for the full sample). As a result, the authors stated that the ATQ-30 precluded "any interpretation of a specificity to depression-related cognitions" but that it was "not clear, however, whether this lack of specificity reflects flaws in the ATQ-30 or overlap in the measures of syndrome psychopathology used" (p. 391). Another limitation of the ATQ is that while many studies use it in terms of its total score, according to Bryant and Baxter (1997), this is inappropriate as a confirmatory factor analysis revealed that a one-factor model does not adequately fit the data. Additionally, the ATQ has an unstable factor structure; one study found four factors (Hollon & Kendall, 1980), another found three (Deardorf, Hopkins, & Finch, 1984), and another found two ( Joseph, 1994), none of which resembled Beck's intended three factor model of negative thoughts about the self, world, or future.

**4. General Cognitive Error Questionnaire (CEQ; Lefebvre, 1980) and the Lower Back Pain Cognitive Error Questionnaire (LBP CEQ; Lefebvre, 1981).** When designing the general CEQ, Lefebvre tried to assess the seven types of cognitive errors outlined by Beck (1979), but as he was unable to obtain satisfactory face validity for all seven CEs, he condensed the list down to four reliable CEs: Catastrophizing, overgeneralizing, personalization, and selective

abstraction. The general CEQ contains short vignettes about recreational, work, and family/home activities, followed by a cognition which contains a cognitive error. The LBP CEQ contains items that are structurally identical to the vignettes on the general test, but include an element of back pain. There are 24 items on each test, both questionnaires have high test-retest reliability (.80-.85) and internal consistency (.89-.92) (Lefebvre, 1981).

**Limitations of self-report questionnaires**

One major limitation of the existing research into cognitive distortions is that it is based largely on self-report measures, which are associated with many limitations. For example, ratings can be highly influenced by the mood that participants are in when they complete the questionnaire (Miranda, Persons, & Byers, 1990), and when people are depressed they tend to have a negative reporting bias (Summerfeld & Endler, 1996). Also, there is little evidence to assume that people think in the ways that the methodologies assume that they do, that they use the dimensions the scales constrain them to, that the scales mean the same thing to the participants as they do to the researchers, or that participants are able to accurately report on the frequency of their thoughts. Even the act of completing questionnaires may influence scores because being asked to fill out a questionnaire introduces an element of self-reflection that might alter the naturally occurring frequency of the thoughts in question (Coyne & Gotlib, 1983).

Another limitation is that questionnaires are content-specific, for example, tapping work or social domains (e.g., General Cognitive Error Questionnaire by Lefebvre (1980)). People might fail to endorse an item because they cannot relate

to the content, thus underestimating their true degree of distortion (Floyd and Scogin, 1998). Additionally, paper-and pencil measures may miss idiosyncratic attitudes or thoughts (Segal, 1984). Related to this is that people might make certain kinds of cognitive errors in one domain (e.g., overgeneralizing in social domains), while the test might contain items for overgeneralizing in work domains and personalization in social domains. Thus, self-reports might not be structured in such a way that content and type of distortion match a person's cognitive set.

Further, researchers assume that maladaptive attitudes and beliefs reported on self-report measures will be related to how people will respond *during* stressful situations. Gunthert, Cohen, Butler, and Beck (2005) have argued that our dispositional (self-report) measures are too far removed from what actually happens in stressful situations, and that "a more direct strategy would be to assess participants' *actual* thoughts in response to naturally occurring stress rather than to request their more *general* reports of underlying dysfunctional attitudes" (p. 78).

**Limitations of research into cognitive distortion in depression**

The research into cognitive distortions in depression is convoluted for a variety of reasons. One is that there is significant overlap among the constructs, making it difficult to tease them apart empirically. For example, the Automatic Thoughts Questionnaire (ATQ; Hollon and Kendall, 1980) might be measuring both negative automatic thoughts and distorted negative automatic thoughts (i.e., automatic thoughts containing cognitive errors). For example, item 10 "I'm so

disappointed in myself" could be a negative thought, while item 23, "I can't do anything well" could be seen as both negative and distorted (i.e., reflecting the cognitive error of all-or-nothing thinking as defined by black-and-white thinking such as seeing things as perfect or a total failure). From a research perspective, it might be useful to separate out the negative automatic thoughts from the distorted negative automatic thoughts, and to label exactly which cognitive errors are embodied in the specific automatic thoughts. As no known study has examined the data in this way, what is currently known about automatic thoughts reflects negative thinking and distorted negative thinking to some unknown degree.

The literature is also convoluted because the constructs are often inappropriately labelled. Automatic thoughts, cognitive errors, and dysfunctional attitudes, are often all referred to as indicators of cognitive distortion. However, these constructs are not interchangeable. It is also problematic because as previously stated, some, but not *all* automatic thoughts are distortions. Further, in a review by Coyne and Gotlib (1983) they stated "although investigators generally use the terms *bias*, *error*, and *distortion* interchangeably, it would be useful to make distinctions" (p. 496). They provided definitions of bias and error from Harvey, Town, and Yarkin (1981): "Bias may be defined as a subjectively based tendency to prefer a given condition over its possible alternatives, whereas error may be defined as an inconsistency between a hypothesis and one or more propositions so strongly believed in as to be considered facts" (p. 348). Coyne and Gotlib (1983) have added that a distortion is a "cognition that persists in the face of strong evidence to the contrary" (p. 496). An example of this confusion in

the literature would be that the Cognitive Bias Questionnaire (Krantz & Hammen, 1979), which is actually a measure of cognitive errors, not bias. Additionally, Krantz and Hammen were unable to identify exactly which cognitive errors the instrument measures: "An effort to construct the depressed-distorted response options to depict equal numbers of categories such as logical errors as arbitrary inference, selective abstraction, overgeneralization, and maximization of negative or minimization of positive proved unsuccessful. Independent judges were unable to reliably separate one such response type from another. However, the distortion responses are all examples of some type of distortion described by Beck" (p. 613).

**Implications for research and practice**

It remains unclear to what extent change in underlying theoretical factors is necessary for symptomatic improvement. Although change in cognitive variables is linked to change in depressive symptoms, there is empirical evidence suggesting that change in cognitive distortions both *causes* and *results from* changes in depressive symptomatology. According to Longmore and Worrell (2007), several studies found that there were no significant between group differences in outcome or follow-up when comparing groups who had received isolated components of CBT (e.g., Borkovec, Newman, Pincus, & Lytle, 2002; Borkovec et al., 2002; Gortner, Gollan, Jacobson, & Dobson, 1998; Jacobson et al., 2006; Jarrett & Nelson, 1987; Zettle & Hayes, 1987). However, given the paucity of studies, Longmore and Worrell (2007) concluded that it was more prudent to conclude that to date there is no evidence that targeting cognitions works better than other aspects of psychological functioning. They suggest that as

different therapies target different systems (i.e., cognitive, behavioural, and physiological), but these systems are interrelated, outcomes appear similar across therapies (Lang, 1985).

Another threat to the utility of cognitive change has come from Ilardi and Craighead (1994), who reviewed eight CBT studies, and reported that in seven of these, 60–70% of depressive symptom improvement occurred within the first four weeks of therapy - before cognitive changes could have occurred. Thus, targeting cognitions could not have been responsible for the symptom reduction. However, Tang and DeRubeis (1999b) challenged this on the basis that many of the participants included in the review by Ilardi and Craighead (1994) were receiving two therapy sessions a week, which would have allowed for cognitive interventions to have taken place and for cognitive changes to have occurred. Tang and DeRubeis (1999b) also stated that Illardi and Craighead (1994) did not tease apart responders from non-responders, which obscured effects, given that participants who responded well to treatment steadily improved and only the non-responders stop improving after week four.

Lack of clear evidence for the role of cognitive change as a mechanism of symptom reduction may be due to methodological limitations. Although many studies have monitored adherence to therapy protocols, perhaps research is needed to assess the accuracy or potency of therapist interventions. For example, a study by Wright and colleagues (2005) compared standard CBT to computer-assisted CBT. Adherence to each procedure was monitored, but they still concluded that "another possibility for the differences observed between computer-assisted

cognitive therapy and standard cognitive therapy is that the computer program directly targets underlying schemas and dysfunctional attitudes for change" (p. 1163).

Another methodological limitation has been articulated by Jacobson and colleagues (1996), who stated that "the absence of an association between treatment condition and target mechanism could have more to do with the inadequacy of currently available measuring instruments" (p. 303). This problem remains unaddressed today, but might be ameliorated by more process-outcome research. Kuyken, Dalgleish, and Holden (2007) stated that "process-outcome research requires complex designs and large samples to generate enough power to detect interaction effects. It is therefore premature to conclude that we have a solid understanding of what CBT works for which people presenting with depression" (p. 10).

The implication of these results for clinical practice is that it might be too soon for third party payers to assert that cognitive behavioural therapy is *the* treatment of choice for depression. This is especially true given previously mentioned findings that some depressions may be rooted more in reality than distortion, and CBT largely focuses on correcting distortions. However, CBT is effective, and although the mechanisms for this are not yet clear, knowledge of a client's cognitive distortions can be therapeutically useful. While we do not yet know if specific cognitive distortions are more closely linked to depression than others, using measures of cognitive distortion in therapy may help pinpoint the specific "hot" issue for a particular person (Floyd & Scogin, 1998).

**Future research directions**

According to a recent article in the American Psychologist (Tashiro & Mortensen, 2006) the current trend in psychological research is geared towards understanding *why* therapy works via the *mechanisms* through which positive changes take place. There are two bodies of research in this area, that of empirically supported treatments (matching treatment modalities to specific disorders), and the common factors approach (examining elements that are common across approaches). Both lines of research have failed to provide evidence of session-to-session causal mechanisms that could account for the symptomatic reduction of symptoms obtained at the end of therapy. However, Oei and Free (1995) established that CBT does change negative cognitions, and they concluded that the following remain to be tested:

1. "The processes of cognitive therapy are the active mechanism in producing the change in cognitions.
2. The processes of cognitive therapy specified are the most effective means of producing the change.
3. The change in cognitions is the critical factor in producing remission from depression across all psychological therapies and, perhaps, even within pharmacotherapy" (p. 175).

Most of the literature that examines the relationships between changes in cognitive distortions and changes in depressive symptomatology comes from outcome studies, many of which assess cognitive changes at only two points in time (e.g., Quilty, McBride, & Bagby, 2008). This method does not allow for a

close examination of temporal changes, and is also problematic because clients might not be able to articulate their core, tacit distortions at the very beginning of therapy (Safran, Vallis, Segal, & Shaw, 1986).

There is also a paucity of studies examining therapeutic processes. Tang, DeRubeis, Beberman, and Pham (2005) state that "to the best of our knowledge, the study by Tang and DeRubeis (1999) provides the only direct link between in-session cognitive changes and substantial symptom relief in CBT (p. 168). As the sudden gains literature was called into question in 2005 by Hardy and colleagues, as stated earlier in this literature review, more process studies need to be conducted.

More careful attention to research design is also needed. After reviewing the literature, Oei and Free (1995) recommended that future studies include measures of both depression and cognitive variables, use outcome measures in a variety of assessment modalities (e.g., self-report and observer-rated), complete follow-ups of up to two years, and conduct cognitive assessments during therapy in addition to strictly pre- and post- therapy assessments.

Another area for future research is in the domain of specific cognitive errors. Not all cognitive errors are represented on Lefebvre's (1981) Cognitive Error Questionnaire, and they are not explicitly identified on the Cognitive Bias Questionnaire (Krantz & Hammen, 1979). Henriques and Leitneberg (2002) have stated that "negative cognitive errors such as personalization, overgeneralization, selective abstraction, and catastrophization may play a role in the etiology and

maintenance of dysphoric mood and are therefore deserving of more research separate from dysfunctional attitudes and automatic thoughts" (p. 258).

It may also useful to more closely examine the relationship or interactions between cognitive errors and a wider variety of content domains, because the existing scales contain items in particular domains (e.g., college life), which may not be compatible with the experiences of everyone who uses these questionnaires, potentially minimizing their ability to predict how they believe they would react in a particular situation. The need to rely on content-dependent questionnaire items could be addressed by the use of an observer-rated measure, as this would allow for the assessment of cognitive errors as they are produced by an individual, independent of predefined content domains.

Finally, research examining the effectiveness of cognitive behavioural therapy for depression has placed the greatest emphasis on cognitive variables, despite the fact that coping is a key component in cognitive behavioural therapy. The next chapter of this literature review will examine what is known about the role of coping in the treatment of CBT for depression, as well as how cognitive and coping variables interact.

**Table 1: Key constructs in cognitive therapy**

| Cognitive Structures | Definition | Examples |
|---|---|---|
| Schemas (i.e., dysfunctional attitudes, beliefs, assumptions) | Relatively tacit, stable "cognitive structures through which events are processed […] they screen, code, categorize, and evaluate stimuli" (Sacco and Beck, 1995, p. 330). | 1. In order to be happy, I have to be successful in whatever I undertake<br>2. To be happy, I must be accepted by all people, at all times<br>3. If I make a mistake, it means that I am inept<br><br>N.B. Examples taken from Beck, 1976, p. 255. |
| Cognitive Errors | Relatively unstable "systematic errors in the depressed individual's information processing, which reflect the activity of dysfunctional cognitive schemas" (Sacco and Beck, 1995, p. 330), and are thought to cause and maintain depression (Beck, 1967).<br>"Cognitive errors [are] a cognitive process that does not consist of content, [and they] contribute to the transformation of dysfunctional attitudes and environmental events into automatic negative | Beck (1976):<br>1. Arbitrary inference (drawing a conclusion based on insufficient or contradictory evidence)<br>2. Selective abstraction (focusing on one piece of evidence and not taking the whole picture into account)<br>3. Overgeneralization (making sweeping conclusions that go far beyond the current situation)<br>4. Magnification (catastophizing) and minimization (incorrectly evaluating the degree of severity of a situation)<br>5. Personalizing (believing that external events were caused by oneself when in fact they were not)<br>6. Absolutistic dichotomous thinking (seeing things as either all-good or all-bad)<br>Burns (1999):<br>7. Mind-reading (assuming and concluding about how others are thinking or feeling without sufficient information)<br>8. Fortune telling (believing that a negative outcome will occur)<br>(N.B. that items seven and eight are more specific versions of Beck's "arbitrary inference")<br>9. Mental filter (which was a re-naming of Beck's "selective |

| | | |
|---|---|---|
| | thoughts." (Kwon & Oei, 1994, p. 334). | abstraction")<br>10. All-or-nothing thinking (which was a re-naming of Beck's "absolutistic dichotomous thinking")<br>11. Should and must statements (inflexible rules about how the world and/or oneself should be)<br>12. Discounting the positive (not counting positive information as valid)<br>13. Emotional reasoning (thinking that how one feels represents reality the way it really is)<br>14. Labelling and mislabelling (labelling rather than describing an event and giving undue emotional tone to an event) |
| Automatic Thoughts | Negative thought *content* about oneself, the world, and the future (collectively referred to as the negative cognitive triad). They are often conscious, automatic, and repetitive (Sacco & Beck, 1995) | 1. The world doesn't like me<br>2. I'm no good<br>3. Why can't I do anything right?<br>4. No one understands me<br>5. I have let people down<br>6. I do not think I can go on<br><br>N.B. Examples taken from the Automatic Thoughts Questionnaire (Hollon & Kendall, 1980) |

# CHAPTER 2

## Review of Literature Part Two:

## Depression, Cognitive Behavioural Therapy, and Coping Patterns

### Introduction

Cognitive behavioural therapy (CBT) focuses on treating depression by helping clients correct their distorted ways of thinking and increasing their adaptive coping skills (Beck, 1995; Beck, Rush, Shaw, Emery., 1979). Perhaps because researchers have emphasized the role of cognitive variables in the etiology and maintenance of depression, the effects of therapy on coping have been largely ignored. Of the studies that have examined changes in coping, only a small range of coping variables have been investigated, and the majority of studies have measured coping using self-report measures, which have been criticized for numerous reasons. This chapter will review what is known about the role of coping in depression, the interaction between coping and cognitive variables, and how coping patterns change in cognitive behavioural therapy.

### Defining the construct of coping

Lazarus and Folkman's (1984) transactional model of stress and coping has dominated the field for over two decades. According to this model, the process by which people interact with their environment is ongoing and reciprocal, and is mediated by both appraisals and coping. Primary appraisal is the evaluation of events or environmental stimuli as irrelevant, benign-positive, or stressful. Stressful events include loss or harm that has already taken place, threats, or challenges. Lazarus and Folkman (1984) stipulate that only situations

appraised as threats or challenges require coping. Secondary appraisal is the perceived availability of one's coping resources. Stress occurs when there are high environmental demands and low perceived ability to cope with them. Coyne, Aldwin, and Lazarus (1981) have defined coping as "efforts, both cognitive and behavioral, to manage environmental and internal demands and conflicts affecting an individual that tax or exceed that person's resources" (p. 440). Lazarus and Folkman's model is usually described as a cognitive model of stress and coping because it proposes that an event's stressfulness is determined by its meaning to the individual as opposed to the objective features of the event (Gunthert, Cohen, Butler, & Beck, 2005).

**Coping and Depression**

In the presence of a threatening stimulus, a reciprocal downward spiral is created between negative emotions, cognitions, behaviours, and physiological reactions that narrows a person`s range of attention, facilitating a focus on information that is deleterious and threatening. While this process helps prepare individuals for immediate fight or flight reactions to stressors by honing in on them, prolonged use of the negative spiral, especially in situations where it is not warranted, is characteristic of depression. As such, psychological treatments have focused on helping clients to re-evaluate their threat appraisals as challenges, allowing positive emotions to develop, which 'broaden-and-build' cognitive and behavioural responses in a positive upwards spiral, promoting greater flexibility in coping responses (Fredrickson, Tugade, Waugh, & Larkin, 2003; Garland et al., 2010). The sooner a negative thought is reappraised, the fewer cognitive

resources are needed to initiate the reappraisal because emotions have not been fully expressed, nor the downwards spiral fully initiated. Depressed people are frequently working in this downward spiral mode, making it more likely that threat appraisals will be automatically generated before positive appraisals, which should theoretically lead to more threat based than challenge based coping patterns (Joormann & Siemer, 2011).

In their review of the literature, Skinner and colleagues found that over 400 labels have been used to describe the various types of coping patterns. They stated that "because the number and kinds of coping are specific to studies, it requires an item-by-item analysis of subscales to decide whether findings are comparable. This lack of comparability makes it difficult to aggregate findings relevant to the same stressor and domain, much less compare results across different stressors or domains" (Skinner, Edge, Altman, & Sherwood, 2003, p. 216-217). As such, Skinner and colleagues organized the 400+ coping labels into 12 parsimonious categories, six of which are based on challenge appraisals, and six of which are based on threat appraisals. The 12 categories selected by Skinner and colleagues (2003) were chosen on the basis that they were exhaustive (all types of coping can be categorized into one of the 12 categories), exclusive (a coping patterns can fit into only one category), conceptually clear, functionally homogenous (the purpose of the coping is distinct), flexible (the categories may be used across different ages, stressors, and contexts), and generative (higher order categories such as helplessness may be used to generate lower order categories such as rumination).

Perry, Drapeau, and Dunkley (2007) translated the work of Skinner and colleagues (2003) into the first known observer-rated measure of coping patterns, titled the Coping Patterns Rating System (CPRS). In order to facilitate a review of the coping research, the literature pertaining to depression and coping has been reviewed using the framework set forth by Skinner and colleagues (2003), and the definitions of coping outlined by Perry and colleagues (2007).

**Depression and challenge based coping patterns.** Skinner and colleagues (2003) identified six coping patterns that are based on challenge appraisals: Problem-solving, information-seeking, self-reliance, support seeking, accommodation, and negotiation. Each coping pattern has been defined according to the definitions provided by Perry and colleagues (2007), including examples for how the coping pattern may manifest at an affective, behavioural, or cognitive level. Following these definitions, examples from existing research have been presented. Where necessary to compare findings across studies, item-by-item analyses of questionnaire items have been provided.

Perry and colleagues (2007) defined problem-solving as "attempting to understand and solve [a stressor] as a problem and effect a desirable solution." Examples include "feeling confident in one's efforts" (affective), "taking instrumental action to effect an outcome" (behavioral), or "planning" (cognitive) (Perry et al., 2007, p.11). Research findings indicate that compared to controls, people with depression use less problem-solving coping (e.g., Billings & Moos, 1984), and assess their use of problem-solving as less systematic and less effective (Nezu, 1986). However, use of problem-solving among depressed

participants has also been found not to differ from controls (e.g., Coyne, Aldwin, & Lazarus, 1981). Similarly, among participants categorized as high or low on depressive symptomotology, Folkman and Lazarus (1986) found no difference in participants' self-reported use of planful problem-solving. This conflicting evidence is significant given that depression has been conceptualized as a lack of problem-solving ability, one CBT therapy being designed specifically to target problem-solving deficits (i.e., Nezu, Nezu, & Perri, 1989).

Information-seeking has been defined as coping "with a stressor by attempting to gather information which may aid in dealing with it", and examples include "interest" (affective), "asking questions" (behavioral), and "self-reflection" (cognitive) (Perry et al., 2007, p. 12). Coyne, Aldwin, and Lazarus (1981) found that despite no significant group differences between depressed participants and controls on the types of stressful events they had experienced, depressed participants reported needing more information than controls before feeling ready to act on a stressor. Folkman and Lazarus (1986) did not replicate this finding in a sample participants categorized as having low or high depression levels.

Self-reliance is considered to have occurred when a person "uses his or her own personal resources to deal with a stressor." It may involve "accepting responsibility" (affective), "shouldering a burden" (behavioral), and "positive self-talk with respect to one's own capacity to deal with a problem" (cognitive) (Perry et al., 2007, p. 16). Self-reliance as defined by Perry and colleagues (2007) may be similar to "self-control" and "accepting responsibility" on the 66- item

revised Ways of Coping Questionnaire (Folkman & Lazarus, 1985) that was used in a study by Folkman and Lazarus (1986). Self-control items included "I tried to keep my feelings to myself"; "kept others from knowing how bad things were"; "tried not to burn my bridges, but leave things open somewhat". Accepting responsibility items included "criticized or lectured myself"; "realized I brought the problem on myself"; "I apologized or did something to make up". Folkman and Lazarus (1986) found that participants who scored higher on depressive symptoms were found to use more self-control and to accept more responsibility (e.g., use more self-reliance). However, it may be that some of the items measuring acceptance of responsibility more closely resemble self-blame than accepting responsibility.

Support seeking has been defined as the ability to "deal with a stressor by seeking, finding or engaging social resources which will aid in effecting a desired outcome." Examples include "spiritual support" (affective), "asking for help or instrumental aid" (behavioral), and "expressing a belief about the importance of obtaining others' support" (cognitive) (Perry et al., 2007, p. 17-18). Compared to controls, depressed participants have been found to seek more informational and emotional support (Coyne, Aldwin, & Lazarus, 1981), and social support (Folkman & Lazarus, 1986).

Accommodation "deals with a stressor by coming to some compromise or acceptance of what can and cannot be changed in the stressor or as a result of it." Examples include "acceptance of limitations" (affective), "committed compliance" (behavioral), or "cognitive restructuring", "cognitive distraction",

and “minimization” (cognitive) (Perry et al., 2007, p. 20). When comparing the coping strategies of depressed adults to non-depressed adults, Coyne and colleagues found no difference in their use of minimization of threat (Coyne, Aldwin, & Lazarus, 1981). Similarly, Folkman and Lazarus (1986) found no difference between participants with high and low levels of depressive symptomatology on distancing. Distancing items included “went on as if nothing had happened”; “didn't let it get to me—refused to think about it too much”; “tried to forget the whole thing”; “made light of the situation—refused to get too serious about it”. Possibly related to distancing is distraction, which was assessed by Parker and Brown (1982), who found that depressed participants used less distraction when depressed than when no longer depressed, and also used less distraction than non-depressed controls. Items that measured distraction included: “Find a challenge in new activities”, “busy yourself in work”, “take on some new work or activity”.

In another study, a comparison between depressed and non-depressed adults indicated that there were no significant group differences on types of stressful events experienced, yet the depressed group rated their stressful situations as less likely to be requiring of acceptance (Coyne, Aldwin, & Lazarus, 1981). Folkman and Lazarus (1986) did not replicate this finding, as they found no difference between high and low depressed groups on perceived need for acceptance, nor any difference in use of positive reappraisal. Contrary to both of these findings, is that Garnefski and colleagues (2002) found acceptance coping to predict higher levels of depression in adults, but positive reappraisal to predict

lower levels of depression in adults (Garnefski, Legerstee, Kraaij, Kommer, & Teerds, 2002).

Negotiation "deals with a stressor by attempting to develop new options beyond those at hand." It may involve "feel[ing] like making a deal" (affective), "bargaining" (behavioral), or "setting priorities" (cognitive) (Perry et al., 2007, p. 21). Among Korean immigrant wives who were employed outside the home, working harder to both take care of the home and maintain employment was linked to higher levels of depression, whereas negotiating household chores with their husbands was associated with lower levels of depression (Um & Dancy, 1999).

**Depression and threat based coping patterns.** Skinner and colleagues (2003) have identified six types of coping patterns that are based on threat appraisals: Helplessness, escape, delegation, isolation, submission, and opposition. Theoretical and empirical evidence for each has been provided below.

Helplessness has been defined as "giving up trying to deal with [a stressor] oneself, while expressing distress about the situation." It may involve "exhaustion" (affective), "giving up trying anything" (behavioral), and "non-problem-solving rumination about problems" (cognitive) (Perry et al., 2007, p. 13). From a theoretical standpoint, helplessness is a key feature of depression (Beck et al., 1979; Seligman, 1972). For example, the learned helplessness model of depression stipulates that people who attribute the cause of negative events to internal, stable, and global factors are more likely to be depressed than people who make external, specific, and unstable attributions for negative events

(Abramson, Seligman, & Teasdale, 1978). Folkman and Lazarus (1986) found that people who had high levels of depressive symptoms were just as likely as those with a low level of symptoms to believe that they could change a stressful situation. However, this could be interpreted as the presence of self-blame, which Perry and colleagues consider to be a form of submission (Perry et al., 2007).

In order to distinguish between helplessness and blame (conceptualized as either an internal or external locus of control), Ozment and Lester (2001) administered a questionnaire to 70 undergraduates that contained items for a helplessness-internal locus of control (e.g., "I never have the energy to meet challenges") and a helplessness-external locus of control (e.g., "Employers have a strong control over how much I make"). Results indicated that these two scales were positively correlated, and positively correlated with depression, leading researchers to conclude that helplessness rather than locus of control (i.e., who caused the helplessness) was more influential on levels of depression.

According to Perry and colleagues (2007) and Skinner and colleagues (2003), a specific form of helplessness is rumination. In a survey study conducted in the Netherlands, a multiple regression analysis found that higher levels of depression were associated with greater amounts of catastophizing and rumination (Garnefski et al., 2002). Similarly, Hong (2007) found that worrying was correlated with both anxious and depressive symptoms, but that rumination was correlated exclusively with depressive symptoms.

Another threat based coping pattern is that of escape, which "deals with a stressor by disengaging and avoiding trying to deal with it whatsoever." Examples

include "wishful thinking" (affective), "procrastination" (behavioral), and "denial" (cognitive) (Perry et al., 2007, p. 13). Research findings have indicated that depressed participants tend to use more wishful thinking and avoidance coping than those who are not depressed (Coyne et al., 1981). Similarly, Folkman and Lazarus (1986) found that participants who scored high on depression used more escape-avoidance coping than those who scored low. This same pattern of results was found among participants with depression and participants with seasonal affective disorder, both of whom were found to use more avoidance coping than controls in a stressful laboratory situation that involved completing an unsolvable anagram task (Sigmon et al., 2006). Another study found that greater levels of avoidance seem to persist even after depression has remitted, as previously depressed participants scored significantly higher on avoidance coping and wishful thinking than did never-depressed participants (Ingram, Trenary, Odom, Berry, & Nelson, 2007).

Delegation "deals with a stressor by overtly or covertly leaving it to others rather than oneself to deal with the stressor." It may involve "complaining" (affective), "acting dependent" (behavioral), or "believing [that] oneself [is] helpless and that others have to do something (cognitive) (Perry et al., 2007, p. 18). Perhaps related, is that Parker and Brown (1982) found that when participants were depressed, they viewed themselves as less effective in their coping behaviors, specifically less effective in their use of socializing, distraction, and problem-solving, than they did when they were not depressed.

Isolation "deals with a stressor by withdrawing from it or isolating oneself." It may involve "feeling afraid to be around others" (affective), "social withdrawal" (behavioral), or "believing that one should avoid others" (cognitive) (Perry et al., 2007, p. 19). Parker and Brown (1982) found that people with depression were found to engage less frequently in socialization coping behaviors when depressed than when not depressed, and also less than controls (Parker & Brown, 1982). Socialization items included caring about one's physical appearance, spending time with friends, socializing, and starting a new relationship.

Submission "deals with a stressor by giving into others and giving up on effecting one's own preferences." It may involve "self-blame" (affective), "doing what one is told without thought" (behavioral), or "believing the stressor cannot be engaged" (cognitive) (Perry et al., 2007, p. 21-22). Beck (1963) observed the presence of self-blame in his depressed patients. For example, he stated that "the patient's tendency to blame themselves for their mistakes or shortcomings generally had no basis. This was demonstrated by the housewife [*sic*] who took her children on a picnic. When a thunderstorm suddenly appeared she blamed herself for not having picked a better day" (p. 327). Similarly, Garnefski and colleagues (2002) found that higher levels of depression were associated with greater use of self-blame (Garnefski, et al., 2002), and Ingram and colleagues (2007) found that previously depressed people scored significantly higher on self-blame than did never-depressed individuals (Ingram, et al., 2007). These findings are in contrast to the results obtained by Coyne, Aldwin, and Lazarus (1981), who

found that depressed participants did not differ from controls in their use of self-blame.

Opposition "deals with a stressor by confronting it and attempting to remove any constraints imposed on one's preferences." It may involve "venting" (affective), "standing and fighting" (behavioral), and "blaming others" (cognitive) (Perry et al., 2007, p. 22). Folkman and Lazarus (1986) found that depressed participants used more confrontive coping than did non-depressed participants. They measured this using the Revised Ways of Coping Questionnaire (Folkman & Lazarus, 1985), and items included "stood my ground and fought for what I wanted"; "tried to get the person responsible to change his or her mind"; "I expressed anger to the person(s) who caused the problem" (p.109). Similarly, Ingram and colleagues (2007) found that previously depressed participants scored significantly higher on blaming others than did never-depressed participants (Ingram, et al., 2007).

In sum, only a few studies have examined the coping patterns outlined by Skinner and colleagues (2003), and an item-by-item analysis of scale items was required to compare results across studies. Nonetheless, the review indicated that depression has been associated with elevated levels of helplessness, escape, isolation, submission, opposition, and support-seeking, and decreased levels of negotiation. There was mixed or insufficient evidence for the role of delegation, problem-solving, information-seeking, self-reliance, and accommodation.

**Interactions between cognitive variables and coping patterns**

In a recent study, Longmore and Worrell (2007), reviewed the component analysis studies of CBT for depressive and anxiety disorders, and found that there was a lack of empirical support for the cognitive mediation hypothesis. These researchers concluded that cognitive interventions were not a necessary component of CBT because they did not add anything beyond the behavioral interventions. To explain these findings they suggested that "interventions are effective when they help people to switch 'modes' (Beck, 1996) or 'schematic models' (Teasdale, 1997). More precisely, psychological states comprise interacting cognitive, affective, behavioral and physiological elements. Any treatment which effectively targets one of these systems may lead to a change in all of them (Borkovec et al., 2002)" (Longmore & Worrell, 2007, p. 184). This quote is similar to the writings of Beck and colleagues; however, Beck and colleagues emphasize changing cognitions as the first step in the process: "Alterations in the content of the person's underlying cognitive structures affect his or her affective state and behavioral pattern" (Beck et al., 1979, p. 8). Further, Longmore and Worrell (2007) added that "it is possible that component studies are flawed because in seeking to dismantle the separate parts of CBT, they neutralize what makes it effective: The interaction of cognitive and behavioral techniques." (p. 184).

One study was found that examined the relationship between cognitive errors and coping in depression (Burns, Shaw, & Croker, 1987). These researchers presented a sample of 13 depressed female inpatients and 12 non-depressed female controls with 22 vignettes from the Cognitive Distortion

Questionnaire (reference not listed). Two trained cognitive therapists coded the type of cognitive errors present in the participants' responses to the questionnaire, as well as the severity of each distortion on a 4-point scale from *none* to *severe*. Women who distorted more severely and who were less willing to cope, as indicated by scores on the Self-Help Inventory (no reference for this scale was provided by the authors), had higher symptoms of depression. The authors concluded that distortions and coping made additive independent contributions to the prediction of depression severity. Unfortunately, they did not report findings for specific cognitive errors, just cognitive distortion in general. Nonetheless, this study highlights the importance of examining cognitive and coping variables together. From a therapeutic standpoint, it is important to consider both cognitive variables and coping, because when distortions are present, cognitive restructuring interventions might be indicated, but when cognitions are accurate, interventions aimed at facilitating coping skills might be indicated (Taylor, 2006).

**How do coping patterns change over the course of cognitive behavioural therapy?**

Relatively few studies have assessed changes in coping over the course of cognitive behavioural therapy (CBT). Nezu and Perri (1989) conducted a component analysis study of problem-solving CBT for treatment of depression using a sample of 39 depressed participants. Group conditions included problem-solving therapy, abbreviated problem-solving therapy, and wait-list control. At the end of therapy, both active treatments were related to greater use of problem-solving on the approach-avoidance scale of Problem-Solving Inventory (PSI;

Heppner & Petersen, 1982), but participants who had received the full problem-solving therapy reported greater confidence in their problem-solving abilities, and greater perceptions of self-control than did participants who had received the abbreviated problem-solving therapy. Additionally, participants in both active treatments demonstrated significant decreases from pretreatment to post-treatment on their levels of depression (on BDI and HRSD), with the full treatment group demonstrating significantly lower post-treatment scores. No change in depression scores were found for the wait-list control group.

A sample of moderately to severely depressed Jordanian university students was randomly assigned to control or CBT treatment conditions. CBT therapy consisted of the Modified Teaching Kids to Cope, and coping was assessed using the Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1988). The intervention group was found to significantly decrease its use of avoidance coping strategies, increased its use of approach coping strategies (i.e., planful problem-solving, support seeking, and positive reappraisal), and significantly reduced both perceived stress, and depression scores. However, the control group was also found to lower its use of avoidance coping strategies, and at posttest was not statistically different from the experimental condition on level of avoidance coping.

In a Hong Kong study, participants were randomized to control or experimental conditions (10 group sessions of CBT), however all participants were receiving pharmacotherapy. Compared to the “control” group, at the end of therapy the CBT group had lower depression scores, fewer negative emotions,

more adaptive coping skills, and less dysfunctional attitudes. However, only change in dysfunctional attitudes significantly predicted change in depressive symptoms, leading Wong (2008) to conclude that "this study did not provide support for the linkage between the acquisition of adaptive coping skills and the reduction in depressive symptoms" (Wong, 2008, p. 147). This effect was attributed to the fact that perhaps not enough time was spent on coping skills (approximately two out of ten sessions).

In another study, patients were assigned to receive either CBT or process-experiential therapy for depression. After therapy, both groups had significantly decreased their suppressive and reactive styles of coping, and increased their reflective coping. There was also no significant group x time interaction for coping (Watson, Gordon, Stermac, Kalogerakos, & Steckley, 2003).

Finally, Wilkinson and Goodyer (2008) examined a sample of 26 depressed adolescents who were randomly assigned to receive either 30 weeks of serotonin-specific reuptake inhibitor antidepressants (SSRIs) plus psychosocial treatment as usual or SSRIs plus psychosocial treatment and CBT. The two groups did not differ on depression levels following treatment, but the CBT group had significantly lower levels of rumination, which Wilkinson and Goodyer (2008) concluded could potentially reduce the risk of relapse for the CBT group.

**Summary of CBT and coping**

In sum, these studies suggest that cognitive behavioral therapies are associated with changes in coping patterns, with mixed results for the relationships between changes in coping patterns and decreases in depressive

symptoms. A major limitation of the available studies is that typically only one type of coping is examined (e.g., problem-solving), or the study used coping categories that have been criticized (approach vs. avoidance distinctions). This paucity of research has been summed up by Gunthert, Cohen, Butler, and Beck (2005) who stated that very little was known about how depressed patients cope with daily stressors, which is "striking, given CT's emphasis on changing perceptions of, and reactions to, daily stressors. If it were shown that patients with poor initial coping skills had worse outcomes in CT, then treatment could be adapted to meet their particular needs. For instance, such patients might require a refined treatment protocol, perhaps one that includes more intensive and/or extended initial training on coping skills and affect regulation" (Gunthert et al., 2005, p. 78).

**Limitations of the coping research**

**The literature is disorganized.** Unfortunately, the coping literature is vast and convoluted; over 400 different labels have been used to describe specific coping strategies, rendering comparisons across studies extremely difficult (Skinner, et a., 2003).

**Problems with validity.** Many of the existing coping instruments have been deemed insufficient to measure the construct of coping. For example, Parker and Endler (1992) stated that:

> "In general, the coping area has produced few reliable and valid coping measures. The continued use of scales, such as the WCQ [Ways of Coping Questionnaire], appears to be more a matter of convenience than anything

> else. Most inventories appear to have task-oriented (problem-solving) and emotion-oriented coping subscales. A smaller number of inventories also have avoidance subscales. A systematic understanding of the relationship among coping strategies, personality, and health will be impeded as long as methodologically inadequate coping measures continue to be used by coping researchers" (p. 336).

**Lack of conceptual clarity.** The existing coping scales have been criticized for lack of conceptual clarity (Skinner et al., 2003). Most notable is that a number of scales rely on the distinction between problem-focused coping, which entails efforts to alter the environment, and emotion-focused coping, which involves palliating one's own thoughts and feelings (Coyne, Aldwin, & Lazarus, 1981). For example, on the COPE (Carver, Scheier, & Weintraub, 1989), emotion-focused coping encompasses both 'positive reinterpretation' and 'denial' subscales, while on the inventory developed by Billings and Moos (1984), emotion-focused coping includes items such as "tried to see the positive side of the situation" as well as "tried to reduce tension by taking more tranquilizing drugs."

Further, the problem-focused *vs*. emotion-focused distinction is not conceptually clear on the basis that in an assessment of 1,332 stressful episodes, 98% of the stressors elicited both problem-focused and emotion-focused coping (Folkman & Lazarus, 1980). Regardless of this finding, researchers continue to assert that problem-solving predominates when people feel they can impact the stressor, and emotion-focused coping predominates when people feel that the

stressor must be endured (e.g., Carver et al., 1989), which has been unsupported by other researchers who have taken contextual variables into account. For example, Baker and Berenbaum (2007) examined for whom and under what conditions emotion-focused coping could be adaptive. They found that individuals who were uncertain about their emotions had fewer positive emotions if they engaged in higher-levels of problem-focused coping. As such, using problem-focused coping may be counter-productive if one quickly decides on a strategy without emotional guidance. Baker and Berenbaum (2007) concluded that: "We believe the diverse nature of emotion-focused coping makes the term ''emotion-focused'' ambiguous and potentially misleading" (p. 96). Skinner and colleagues (2003) have also stated that actions may simultaneously sooth one's emotions while attending to the stressor, making the distinction between problem- and emotion-focused coping an arbitrary one. As such, they suggested that "the three most common distinctions (problem- vs. emotion-focused, approach vs. avoidance, and cognitive vs. behavioral) no longer be used (Skinner et al., 2003, p. 216).

**The literature is incomplete.** Finally, what is known about the relationship between coping and depression is incomplete because most researchers have conceptualized coping as something that is carried out at a cognitive or behavioral level. In fact, Coyne, Aldwin, and Lazarus (1981), have defined coping as "efforts, both cognitive and behavioral, to manage environmental and internal demands and conflicts affecting an individual that tax or exceed that person's resources" (p. 440). Consequently, coping at an affective

(or emotional level) has been virtually ignored. Perhaps the closest approximation is that coping has been categorized as either emotion-focused or problem-focused in nature, but this is more accurately conceived as what one is coping *with* (i.e., the problem or one's internal state) as opposed to what one is *using* to cope (Lazarus & Folkman, 1984).

Of the three manifestations (affective, behavioral, cognitive), cognitive coping has recently gained attention in the cognitive therapy literature, in the form of compensatory skills. The Ways of Responding (Barber and DeRubeis, 1992; 2001) was designed to measure the acquisition of CT coping skills such as meta-cognition, planning, and problem-solving skills. According to this method, respondents are presented with challenging scenarios, and asked to imagine what they would think and do if the situation were to happen to them. They write down their answers, and their responses are coded as something a CT therapist would encourage, a depressogenic statement, or neutral (Strunk, DeRubeis, Chiu, & Alvarez, 2007). In 2001, Barber and DeRubeis conducted their first study using the Ways of Responding. At intake, better compensatory skills were associated with lower dysfunctional thinking, but were not correlated with self-control or attributional style.

**Extensive use of self-report measures. S**elf-report instruments assess how people typically have coped or would hypothetically cope with stressors (Parker & Endler, 1992). This methodology has been found to be a poor predictor of how people actually cope with stressors because it assumes that the way people cope with one type of stressor is consistent with how they will cope with a

completely different stressor (Folkman & Lazarus, 1980). Additionally, scales may be problematic because they contain value-laden items. Lazarus and Folkman (1984) have emphasized that ways of coping should be considered as distinct from coping outcomes, meaning that a priori classifications of coping as either good or bad are unwarranted. Skinner and colleagues (2003) have supported this argument by specifying that only when one considers the context, can the adaptiveness or maladaptiveness of a particular coping be determined. Skinner and colleagues state that, "given the circumstances, every possible way of coping can be appropriate, normative, or right" (Skinner et al., 2003, p. 231). In order to assess whether or not a coping pattern is adaptive or maladaptive for a particular context, Skinner and colleagues have suggested that subjective experience/resources, long-term consequences, and qualities of the stressor be considered. For example, coping that is organized and flexible, and that leads to a reduction of the stressor is adaptive, whereas coping that is involuntary and leads to feeling overwhelmed may signal that the individual is not able to adequately cope with the stressor, and environmental parameters should be adjusted. In terms of long-term consequences, Skinner and colleagues have stated that prolonged use of certain ways of coping such as social withdrawal, opposition, helplessness, or self-blame may lead to increased symptoms or personal vulnerabilities.

Despite the suggestion that a priori classifications are unwarranted, some scales rely on a priori definitions of adaptiveness. For example, Carver and colleagues (1989) have conceptualized three of the subscales on the COPE as

"arguably less useful". These three subscales include: "Focus on and venting of emotions", "behavioral disengagement", and "mental disengagement".

**Future research directions**

Relatively little is known about how people cope with stress during a depressive episode, and even less is known about how coping patterns and cognitive vulnerabilities such as cognitive errors interact, and how coping patterns may change over the course of cognitive behavioural therapy for depression. Given the limitations of existing self-report measures, new measures are urgently needed to investigate these areas of inquiry. Recently proposed methodological solutions to this quandary stem from the 12 parsimonious coping patterns outlined by Skinner and colleagues (2003) and the translation of these construct into an observer-rated measure of coping patterns by Perry and colleagues (2007). Future studies may benefit from investigating the role of coping in depression, the interactions between coping patterns and cognitive errors, and examining how coping patterns change over the course of CBT using the new observer-rated measure of coping patterns developed by Perry and colleagues (2007).

# CHAPTER 3

## The Presence of Cognitive Errors in Depression

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**Abstract**

According to Beck and colleagues (1979) cognitive errors (CEs) are considered to maintain depressive thinking in Major Depressive Disorder. This theoretical assumption has rarely been tested using an observer-rated measure of CEs. Participants (*N = 45*) were drawn from an early cognitive therapy (CT) component analysis study (Jacobson et al., 1996; 2000). All participants were offered 20 sessions of CT, and CEs were assed at early and late therapy sessions using the Cognitive Errors Rating System (CERS; Drapeau et al., 2008). Depression was assessed pre-and post-therapy with the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1967) and the Beck Depression Inventory (BDI; Beck et al., 1979), and every session with the BDI. Results indicated that during an average 50-minute early therapy session, participants produced 3.50 cognitive errors (CEs) per 1000 words (*SD* = 2.23), and that the most prevalent clusters of cognitive errors by proportion of total, were selective abstraction, followed by overgeneralization, personalizing and fortune telling. Participants had more negative than positive CEs at early therapy. There was also no significant relationship found between total, positive, or negative CEs and level of depression on the Beck Depression Inventory (BDI). Using a median split, "high distorters" had significantly more negative, but not more positive CEs than "low distorters" despite not differing on their intake depression scores on either the BDI or HRSD. Implications for psychotherapy and future research are discussed.

## The Presence of Cognitive Errors in Depression

### Introduction

Beck's cognitive therapy is based on a stress-diathesis model of depression (Sacco & Beck, 1995). As a result of negative early life experiences, people are thought to develop negative schemas about themselves, the world, and the future, which later serve as a diathesis or predisposition towards future episodes of depression. Environmental stressors in later life may activate these latent negative schemas, resulting in dysfunctional attitudes and negative automatic thoughts. While dysfunctional attitudes and automatic thoughts are negative in content, the process by which people distort reality is called cognitive errors (CEs) (Beck, Rush, Shaw, & Emery, 1979). Cognitive errors may be identified in the content of negative automatic thoughts, and in deeper dysfunctional beliefs, assumptions, and attitudes (Beck, 1995). Cognitive errors and negative schemas are considered to be a primary pathway from which depressive symptoms result (Beck et al., 1979).

Research findings consistently indicate a correlation between cognitive distortion and severity of depressive symptoms. For example, automatic thoughts have been found to significantly correlate with depression in adults (Harrell & Ryon, 1983), children (e.g., Kazdin, 1990), and undergraduates (e.g., Dobson & Breiter, 1983; Hollon & Kendall, 1980), and similar results have been obtained for cognitive errors (e.g., Hammen, 1978; Lefebvre, 1981; Sato, 2004; Smith, Peck, Milano, & Ward, 1988), and dysfunctional attitudes (e.g., Dobson & Breiter, 1983). Additionally, findings indicate that adults with depression have

higher levels of automatic thoughts (e.g., Harrell & Ryon, 1983; Hollon & Kendall, 1980), cognitive errors (e.g., Krantz & Hammen, 1979; Krantz & Lui, 1987; Lefebvre, 1981; Michael & Funabiki, 1985; Norman, Miller, & Klee, 1983), and dysfunctional attitudes (e.g., Dobson & Shaw, 1986; Hamilton & Abramson, 1983; Hollon, DeRubeis, & Evans, 1987) than do non-depressed controls.

Despite the general relationship between cognitive distortions and depression, high distortion rates are not common among all clients with depression. Based on empirical evidence and a review of the literature, Miller and Norman (1986) concluded that on average, approximately 50% of depressed clients may be considered "high" distorters, and that during the acute phase of depression, only 40-50% of people with depression exhibit significantly elevated levels of distorted cognitions (e.g., Hamilton & Abramson, 1983; Norman, Miller, & Klee, 1983). Nonetheless, distorted thinking seems to be unique to depressed clients, as Miller and Norman (1986) found that upon admission into the hospital, 65% of depressed patients could be classified as being high distorters on the Cognitive Bias Questionnaire (CBQ; Krantz & Hammen, 1979), compared to only 8% of the nondepressed patient group.

Cognitive therapy (CT) for depression emphasizes the importance of helping clients to identify and restructure their distorted ways of thinking (Beck et al., 1979), and outcome studies support the therapeutic value of these interventions. For example, cognitive changes have been found to correlate with recovery from depression (e.g., DeRubeis et al., 1990; Furlong & Oei, 2002; Oei

& Shuttlewood, 1997; Oei & Sullivan, 1999), and cognitive therapy has been found to restore levels of cognitive distortion back to nondepressed levels (e.g., Kwon & Oei, 2003; Miller & Norman, 1986). These findings are important because successful CT should not only reduce symptoms, but also change the underlying theoretical factors believed to precipitate and maintain depression, and decrease the likelihood of having a subsequent episode.

**The nature of cognitive errors**

Specific cognitive errors have been outlined by Beck (1976), including: Arbitrary inference, selective abstraction, overgeneralization, magnification (catastrophizing) and minimization, personalizing, and absolutistic dichotomous thinking, and by Burns (1999): Mind-reading, fortune telling, mental filter, all-or-nothing thinking, should statements, discounting the positive, emotional reasoning, and labelling and mislabelling. However, measuring these cognitive errors has been difficult. For example, Hammen and Krantz (1976) designed a self-report questionnaire to measure specific CEs using case vignettes. When developing the scale items, agreement among independent raters could not be reached for the type of CE represented, therefore items were re-categorized more generally as being either distorted or not distorted. Lefebvre (1981) also attempted to assess CEs using a self-report measure of seven different CEs, but due to difficulties with reliability, these seven were condensed down to the four errors of catastrophizing, over-generalizing, personalization, and selective abstraction.

Additionally, studies that have examined cognitive errors in depression have only reported findings in terms of a general level of distortion, rather than for specific CEs (e.g., Beach, Nelson, & O'Leary, 1988; Hamblin, Beutler, Scogin, & Corbishley, 1993; Moreno, Cunningham, Gatchel, & Mayer, 1991; Smith, O'Keeffe, & Christensen, 1994). Or they have reported specific CEs for a clinical group, but did not distinguish between participants with an anxiety disorder from those who were depressed (e.g., Muran & Motta, 1993). A few findings about what is known about specific CEs in depression are presented below.

Overgneralizing has been defined as the tendency to make a "sweeping negative or positive conclusion that goes far beyond the situation" (Drapeau et al., 2008, p. 26). One study compared the reactions of dysphoric and nondysphoric participants after giving them bogus negative feedback on a test of social perceptiveness (Wenzlaff & Grozier, 1988). While both groups lowered their self-evaluations of social perceptiveness after receiving the feedback, only the dysphoric participants also lowered their ratings in proficiency judgments (Wenzlaff & Grozier, 1988). In another study, Hammen and Krantz (1976) gave dysphoric and nondysphoric female undergraduates bogus feedback about their potential skills as a therapist. After receiving the feedback, only the dysphoric participants became more negative in their self-evaluations of personal qualities, which they had not been given feedback about.

In a third study, Klar, Gabai, and Baron (1997) compared dysphoric and nondysphoric high school seniors on a generalization task. No reference was

provided for this measure, but the questionnaire items were included in a table in the paper. The task included four positive and four negative hypothetical scenarios in the domains of social and academics events. Participants were asked how likely it was that this event would happen again if a similar antecedent was present. Following a positive event, nondysphoric participants were found to make more generalizations than dysphoric ones, and the opposite pattern was found for negative events, for which dysphoric participants made more generalizations than did nondysphoric ones. In a second study they devised a list of eight hypothetical neutral events (e.g., "You went to a disco and the first song you heard was by Queen. How probable is it that the next time you go to a disco, the first song you hear will be by Queen?", p. 582), and no group differences were found between the groups for these neutral events.

Magnification/minimization has been defined as the tendency to evaluate oneself, others, or a situation in a way that magnifies or minimizes the negative or positive aspects (Drapeau et al., 2008). Wenzlaff and Grozier (1988) gave dysphoric and nondysphoric college students bogus feedback on a social perceptiveness test. Consistent with Beck's theory of depression, dysphoric participants rated social perceptiveness to be more important when they were given failure feedback on the task, while nondysphoric students rated the task as more important when they received successful feedback on the task (Wenzlaff & Grozier, 1988). This finding is consistent with Ellis' theory that depressed clients tend to "awfulize" or magnify the unpleasantness of situations (Ellis, 1980). However, Wenzlaff and Grozier's finding does not necessarily illustrate that

dysphoric participants committed an "error" that was disproportionate to the demands of the situation, but just they responded differently to the feedback than did nondepressed controls. Additionally, the dysphoric participants in Wenzlaff and Grozier's study did not minimize the importance of their success on social perceptiveness (relative to controls) as Beck's theory postulates that they would. The results however do suggest that dysphoric people, relative to controls, may be differentially impacted by negatively and positively valenced events.

Fortune telling involves "making the assumption that the worst or best possible outcome will occur in a situation" (Drapeau et al., 2008, p. 18). As mentioned above, a study by Hammen and Krantz (1976) involved having dysphoric and nondysphoric female undergraduate psychology students assess their potential abilities as a therapist. They then completed a task which purported to measure their potential to be a good therapist, received bogus feedback, and re-assessed their potential ability to be an effective therapist. While there were no pre-test differences between the groups, post-feedback scores indicated that only the depressed group made more negative future predictions after receiving negative feedback.

Miranda and Mennin (2007) asked university students to complete the Generalized Anxiety Disorder Questionnaire-IV (Newman et al., 2002), the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), and the Future

Events Tasks[6]. Results indicated that depression and anxiety scores were correlated with endorsing "yes" to negative items, but only depression scores were correlated with endorsing "no" to positive items. This pattern was replicated for degrees of certainty; higher depression scores and higher anxiety scores were related to being more certain that the negative events would happen to them, while only higher depression scores were related to thinking that positive events would not happen to them.

Only one study was found that assessed ten individual CEs (Burns, Shaw, & Croker, 1987); however, the findings were not reported for each CE specifically, but for distortion as a whole. In this study by Burns and colleagues (1987), the cognitive errors of 13 depressed female inpatients and 12 nondepressed female controls were assessed using the Cognitive Distortion Questionnaire (no reference was listed). Results indicated that there was no difference in the frequency of cognitive distortions between the two groups, but that the degree of distortion made by the depressed women was more severe.

**Limitations of the existing literature**

There is a paucity of research about the nature of specific cognitive errors in depression, and what is known has been based exclusively on self-report instruments, which are vulnerable to a number of limitations. For example, a

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[6] The Future Events Tasks was adapted for the study, and is a self-report questionnaire that lists positive and negative events, and asks participants if they thought the event would happen to them in the future, as well as the degree to which they held that conviction. An example of a positive event would be "Have a successful career" and an example of a negative event would be "Have family disapprove of life choices". These events were chosen based on face validity, and were adapted from previous studies (Andersen, 1990; Andersen & Limpert, 2001; Andersen, Spielman, & Bargh, 1992; MacLeod, Byrne, & Valentine, 1996; MacLeod, Williams, Bekerian, 1991; Miranda & Andersen, 2006).

person's mood can influence how they will respond to items on a questionnaire (Miranda, Persons, & Byers, 1990), especially in the case of depression where a negative reporting bias is likely (Summerfeld & Endler, 1996). Further, the ways that participants habitually think may not be captured in the format that the questionnaire was written in, the questionnaire items may not mean the same thing to the participants as they do to the researchers, participants may not be able to accurately report on the frequency of their thoughts, and the act of completing a questionnaire could alter thinking patterns by inducing self-reflection (Coyne & Gotlib, 1983).

Another limitation is that questionnaires require content for the items, for example, questions may include items relating to particular academic or social events (e.g., the Negative and Positive Cognitive Error Questionnaire by McKenna, 1987), and participants may neglect to endorse an item because they cannot relate to the content, thus under-representing their actual level of distortion (Floyd & Scogin, 1998). Additionally, unique thoughts and beliefs may not be captured by paper-and pencil measures (Segal, 1984), and self-report measures rely on the assumption that the maladaptive attitudes and beliefs reflect how people actually think during stressful situations (Gunthert, Cohen, Butler, & Beck, 2005). Gunthert and colleagues have argued that dispositional self-report measures may be too far removed from what actually happens in stressful situations, and that "a more direct strategy would be to assess participants' *actual* thoughts in response to naturally occurring stress rather than to request their more *general* reports of underlying dysfunctional attitudes" (p. 78). Lastly, most of the

research has used dysphoric rather than depressed samples, and the studies using depressed samples have included a relatively small number of participants.

One implication of these measurement limitations has been articulated by Jacobson and colleagues (1996) who stated that "the absence of an association between treatment condition and target mechanism could have more to do with the inadequacy of currently available measuring instruments" (p. 303). This problem remains unaddressed today, as Similarly, Quilty, McBride, and Bagby (2008) have stated: "Although empirical support for the efficacy of cognitive behavioural therapy (CBT) as a treatment for major depressive disorder (MDD) is well established, its mechanism of action is uncertain" (p. 1531). Kuyken, Dalgleish, and Holden (2007) have proposed that more psychotherapy process research is needed to investigate the mechanisms behind CBT's effectiveness. Oei and Free (1995) have also suggested that further attention to research design is needed. Their recommendations include assessing both depression and cognitive variables, using outcome measures from a variety of assessment modalities (e.g., self-report and observer-rated), and making cognitive assessments during the course of therapy.

A final limitation of the existing research pertains to the paucity of knowledge about the role of specific cognitive errors in depression. Cognitive errors are not explicitly identified on the Cognitive Bias Questionnaire (Krantz & Hammen, 1979), and only four are represented on Lefebvre's (1981) Cognitive Error Questionnaire. Henriques and Leitneberg (2002) have stated that "negative cognitive errors such as pesonalization, overgeneralization, selective abstraction,

and catastrophization may play a role in the etiology and maintenance of dysphoric mood and are therefore deserving of more research separate from dysfunctional attitudes and automatic thoughts" (p. 258). It would also be useful to more closely examine cognitive errors independent of content domains that existing scales rely on, such as college life, which may not address the experiences of everyone who uses these questionnaires.

**The current study**

The current study assessed cognitive errors with an observer-rated method designed to assess cognitive errors: The Cognitive Errors Rating System (CERS; Drapeau et al., 2008). This method allows for an in-session process-level analysis of cognitive errors as they actually occur spontaneously in-session. As such, the CERS circumvents many of the problems associated with traditional self-report questionnaires.

The goals of this research were to describe a profile of the type and frequency of cognitive errors for depressed participants at therapy intake, and to examine the relationships between cognitive errors and depression. The following hypotheses were tested: (1) at early therapy depressed participants would display more negative than positive CEs, (2) depression would be positively correlated with negative CEs and negatively correlated with positive CEs. Also examined were whether or not positive and negative CEs were related to one another, and if high and low distorters (determined by early therapy CEs) would differ from one another on levels of depression at early therapy.

## Method

**Participants**

Forty-five participants (*N = 45*) were drawn from the cognitive therapy (CT) treatment arm of an earlier component study of CT (see Jacobson et al., 1996; 2000). Participation requirements included a diagnosis of Major Depression as defined according to the *Diagnostic and Statistical Manual of Mental Disorders* (3rd edition, revised; *DSM—III—R*; American Psychiatric Association, 1987; also consistent with the *DSM-IV*), a score greater than 13 on the 17-item Hamilton Rating Scale for Depression (HRSD; Hamilton, 1967), and greater than 19 on the Beck Depression Inventory (BDI; Beck et al., 1979). Exclusion criteria included having a concurrent mental disorder, hospitalization for psychosis or risk of suicide. Thirty-five (78%) of the participants were female, and the mean age of the sample was 39.24 years (range = 21 – 61 years). Two of the participants (4.4%) were African American, 34 (75.6%) were Caucasian, three (6.7%) were Native American, and two (4.4%) were Asian; the remaining four participants did not report their ethnicity.

**Therapists**

Cognitive therapy was provided by four experienced cognitive therapists whose mean age was 43.5 years (range: 37 – 49 years). All therapists had previously served as CT therapists in at least one previous clinical trial of CT, had an average of 14.8 years of postdegree clinical experience (range: 7-20 years), and had been practicing CT for an average of 9.5 years since their formal training (range: 8 to 12 years). Therapists provided manualized treatment based on the manual of Beck and colleagues (1979). Treatment fidelity was assessed by having

a CT expert (K. Dobson) listen to 20% of the audio-taped sessions, chosen at random. If therapists deviated from the treatment protocol, they were promptly notified. Adherence to the treatment manual was also independently evaluated by trained raters, and monthly meetings were held for therapists to discuss any treatment questions with experts.

**Therapy**

All participants were offered 20 sessions of standard cognitive therapy. Participants who attended less than 12 sessions were considered a dropout. Therapy was designed to challenge participants' negative thinking, to help them develop more accurate beliefs, and increase their adaptive coping skills.

**Measures**

*Hamilton Rating Scale for Depression* (HRSD; Hamilton, 1967) is a 17-item clinical interview with excellent psychometric properties, and is widely used to assess the severity of depressive symptoms (Clark & Watson, 1991).

*Beck Depression Inventory* (*BDI;* Beck et al., 1979) is a widely used 21-item self-report instrument of depressive symptoms that has excellent psychometric properties (Beck, Steer, & Garbin, 1988).

*The Cognitive Errors Rating System* (CERS; Drapeau, Perry, & Dunkley, 2008). The CERS is an observer-rated measure of cognitive errors. A detailed manual describes 15 cognitive errors, which are based on the work by Beck (1976), J. Beck (1995), Burns (1999), and DeRubeis, Tang, and Beck (2001): (1) Fortune telling, (2) labeling, (3) overgeneralizing, (4) all-or-nothing thinking, (5) discounting the positive or negative, (6) emotional reasoning, (7) magnification

and/or minimization of the negative or positive, (8) mental filter, (9) should and must statements, (10) tunnel vision, (11) jumping to conclusions, (12) mind-reading, (13) personalization, (14) inappropriate blaming/crediting of self, while ignoring the roles of others, and (15) inappropriate blaming/crediting of other, while ignoring the role of self.

The 15 cognitive errors from the CERS may be subdivided into negative or positive valences, depending on the impact of the error (negative or positive) on the individual, resulting in 30 different CEs. The CEs may also be grouped into four higher order clusters according to Lefebvre (1981), fortune telling (Cluster A: CE 1), overgeneralization (Cluster B: CEs 2 and 3), selective abstraction (Cluster C: CEs 4 – 11), and personalizing (Cluster D: CEs 12-15). These four clusters may be subdivided into positive and negative valences, resulting in eight clusters.

The CERS enables trained raters to assess the type and quantity of cognitive errors as they spontaneously occur in a person's speech. While it has been written that mood priming is necessary to capture latent cognitive vulnerabilities such as schemas and dysfunctional attitudes (Segal & Ingram, 1994), cognitive errors have been found at multiple levels of cognition, including the more accessible automatic thoughts (Beck, 1995), suggesting that they may be captured without the use of a prime. Further:

> "According to cognitive therapy, cognitive constellations underlie affect and become accessible and modifiable only with *affective arousal.* In the language of cognitive therapy, these are 'hot cognitions.' The importance

> of engagement may be illustrated by contrasting depressed and phobic patients. Because depression is so pervasive, the 'hot cognitions' are present and available for examination in the therapist's office. In contrast phobic or panic disorder patients generally have little distress in the presence of the therapist and may have little anxiety anywhere outside the phobic or stimulus situation. In order to produce change among phobics and panic patients, anxiety has to be induced, either through *in vivo* exposure, imagery, or provocative techniques such as hyperventilation. Consequently, anxiety-related cognitions become highly salient, accessible, and open to testing and modification" (Beck & Weishaar, 1989, p. 29).

Based on the above quote, it seems likely that as this is a depressed sample, enough distortions would be present to be captured by an observer-rated measure of distortion.

In the current study, one PhD student was trained by the developers of the CERS, and she trained a second PhD student. These two PhD students then trained the other two raters (one MA student and one PhD student). Sufficient internal and external validity has been obtained (see D'Iuso, Blake, & Drapeau, 2007; Drapeau & Perry, 2005; Drapeau, Perry, Blake, & D'Iuso, 2007; Perry, Drapeau, Dunkley, Foley, Blake, & Banon, 2007). In order to determine inter-rater reliability, 18% of the cases were rated in consensus, and inter-rater reliability was good. For the 30 individual CEs, the Intra-class Coefficient (ICC 2,1) was .81, for the 15 CEs it was .78, for the 8 clusters it was .88, for the 4

clusters it was .84, for positive versus negative CEs it was .92, and for the total CEs it was .86.

**Procedure**

All participants were offered 20 sessions of Cognitive Therapy for depression, and all therapy sessions were audio-taped. In the current study, sessions 3 and 19 (or the penultimate session if fewer than 20 therapy sessions were completed) were selected to serve as the early and late therapy sessions. Session 3 was chosen to serve as the early assessment of cognitive errors for several reasons. First, the first few sessions typically involve activities such as explaining the treatment rationale, setting the therapeutic parameters, and obtaining a client history (Beck et al., 1979), tasks which may not be conducive to the spontaneous production of distortions in the client's narrative. Further, Horvath and Luborsky (1993) reported that the therapeutic alliance forms during the first five sessions, and peaks during session three. A positive bond likely facilitates greater disclosure on the part of the client (Rector, Zuroff, & Segal, 1999). Additionally, formal cognitive restructuring exercises such as challenging automatic thoughts and devising more realistic alternatives are not typically introduced until at least session four (Ilardi & Craighead, 1994), suggesting that a client's quantity of cognitive distortions would not have been purposefully targeted or reduced by the participant. The penultimate session was chosen to capture spontaneous cognitive distortions at late therapy. This decision was made to ensure that assessment took place as late as possible during a working phase of therapy, but before last session, when end-of-treatment tasks such as summaries

and relapse prevention strategies would be likely to eclipse the potential presence of cognitive errors.

These early and late therapy sessions were transcribed, and the verbatim transcripts were coded by trained independent raters using the Cognitive Errors Rating System (Drapeau, Perry, & Dunkley, 2008). Any identifying information was removed from the transcripts, and session numbers were replaced with a random code to ensure that raters would be blind to the therapy session numbers.

## Results

### Preliminary analyses

As the sample contained fewer than 50 participants, the Shapiro-Wilk test was used to determine the normality of the variables. Results indicated that all CE variables were non-normally distributed; therefore non-parametric tests were used for all analyses. Early therapy cognitive errors were assessed at session three for 44 participants and session two for one participant based on availability. Late therapy transcripts were more varied, with the average session being session 17.98 (*SD* = 2.50, range = 8 – 19). The original study by Jacobson and colleagues (1996) assessed depression pre- and post-therapy using both the BDI and the HRSD, and every session using the BDI. As such, early and late therapy depression scores were obtained using the BDI score that corresponded to the same session that the cognitive errors had been assessed for using the CERS. Participants were missing BDI scores for the session that corresponded to their CERS ratings in three instances. Data were estimated for those observations based on the closest available BDI scores.

**Profile of cognitive errors at early therapy**

On average, participants spoke 3365.31 words (*SD* = 1488.08) during a 50-minute session of early therapy. These sessions contained an average of 3.50 cognitive errors (CEs) per 1000 words (*SD* = 2.23), totaling 10.91 CEs per session (*SD* = 6.46). Of these CEs, 10.27 (94%) were negative in valence, with only .64 (6%) being positive in valence. The frequency of each cognitive error per 50-minute session, and expressed as a proportion of total CEs can be seen in Table 1.

[Insert Table 1 about here]

**Prevalence of negative vs. positive CEs at early therapy**

A two-tailed Wilcoxon signed-rank test indicated that at early therapy participants had more negative than positive CEs for total scores, and for each of the four CE clusters: fortune telling, overgeneralization, selective abstraction, and personalizing (see Table 2).

[Insert Table 2 about here]

**Correlations between negative and positive CEs at early therapy**

Spearman (two-tailed) correlations were computed to assess if positive and negative cognitive errors were related to one another. No significant correlation was found for positive and negative CEs ($r$ = -.20, $p$ = .19). The four CE clusters of fortune telling, overgeneralization, selective abstraction, and personalizing were correlated with each other. Fortune telling negative and selective abstraction negative were significantly correlated ($r$ = .31, $p$ = .04), and overgeneralization negative and selective abstraction negative were significantly correlated ($r$ = .31,

$p$ = .04). No other combinations were significantly correlated with one another; no positive CE cluster was related to a negative CE cluster.

The above correlations were recomputed for high and low distorters. Participants were categorized as high or low distorters based on their median split scores for early therapy total cognitive errors (e.g., Dozois, Covin, & Brinker, 2003). A two-tailed Mann-Whitney test confirmed that the group that had been classified as high distorters endorsed significantly more total cognitive errors (*Mdn* = 4.74, range = 2.75 - 10.26), than did the low distorters (*Mdn* = 1.94, range = .00 - 2.57; $U$ = .00; $p$ < .001). These differences were largely due to negative cognitive errors, which significantly differed between the groups (high distorters: *Mdn* = 4.33, range = 2.59 - 10.26; low distorters: *Mdn* = 1.70, range = .00 - 2.40; $U$ = .00; $p$ <.001), while positive CEs did not (high distorters: *Mdn* = .00, range = .00 - 1.15; low distorters: *Mdn* = .17, range = .00 - .86; $U$ = 233.00; $p$ = .62).

Two-tailed Spearman correlations indicated that total positive CEs and total negative CEs were not correlated for high distorters ($r$ = -.35, $p$ = .11). However, there were significant correlations observed for the following CE clusters: Fortune telling positive and selective abstraction positive( ($r$ = .70, $p$ <.001); fortune telling negative and selective abstraction positive ($r$ = -.43, $p$ = .04); selective abstraction negative and personalizing positive ($r$ = -.51, $p$ = .01). Among the low distorters, again total positive CEs and total negative CEs were not significant correlated ($r$ = -21, $p$ = . 34); however, the following CE clusters were significantly correlated: Selective abstraction negative and selective

abstraction positive ($r$ = .43, $p$ = .04), personalizing positive and overgeneralization negative ($r$ = -.43, $p$ = .04).

**CEs and level of depressive symptoms at early therapy**

No significant correlations were found among total, total positive, or total negative CEs and level of depression on the Beck Depression Inventory (BDI) at early therapy based on the use of Spearman one-tailed correlations. Similarly, no positive or negative CE Cluster was significantly correlated with depressive symptoms at early therapy on the BDI. In terms of the 30 specific CEs, no positive CEs were significantly correlated with level of depression on the BDI. Significant correlations for negative CEs were found for magnification ($r$ = .30, $p$ = .02) and for should and must statements ($r$ = - .27, $p$ = .04). As more correlations were hypothesized, high versus low distorters were examined separately.

In terms of depression scores, a two-tailed Mann-Whitney test indicated that high and low distorters did not differ from one another on their intake depression scores on either the BDI ($U$ = 244.50, $p$ = .85) or HRSD ($U$ = 178.50, $p$ = .09), nor on their early session BDI scores ($U$ = 248.00, $p$ = .91). Among the low distorters ($n$ = 22), the only significant correlation between CEs and depressive symptoms was an inverse relationship between positive fortune telling and depression scores on the BDI ($r$ = -.44, $p$ = . 02). For high distorters ($n$ = 23), significant correlations were found for depression and total CEs ($r$ = .47, $p$ = .01), negative CEs ($r$ = .38, $p$ = .04), and negative selective abstraction ($r$ = .35, $p$ =

.05). Depressive symptoms were also inversely related to positive CEs ($r$ = -.14, $p$ = .03), and positive overgeneralization ($r$ = -.41, $p$ = .03).

As high distorters had associations between positive and negative CEs and depression, while low distorters only had an association between positive fortune telling and depression, correlations were conducted to determine if high distorters had a general tendency to distort. Tentative support for this hypothesis was found using one-tailed Spearman correlations which indicated that positive and negative CEs approached a significant correlation for high distorters ($r$ = -.35, $p$ = .05), but not for low distorters ($r$ = -.21, $p$ = .17).

## Discussion

The purposes of the study were to investigate several key tenets of cognitive therapy, specifically the nature of cognitive errors in depression and relation to depressive symptoms. The main findings have been presented and discussed, followed by conclusions, limitations, strengths, and contribution to knowledge, and finally, recommendations for future research and clinical practice.

### Cognitive profile at early therapy

In terms of a cognitive profile, all cognitive errors were found to some degree in the spontaneous speech of depressed participants, which provides empirical evidence for the existence of cognitive errors in depression described by Beck (1976) and Burns (1999). As for prevalence rates, selective abstraction was most prevalent, followed by overgeneralization, personalizing, and finally fortune telling. When individual CEs were separated out from the clusters, fortune telling negative was the 6$^{th}$ most prevalent CE out of a possible 30 CEs. Specifically, the

top six CEs were labeling negative, followed by should and must negative, jumping to conclusions negative, mind-reading negative, overgeneralizing negative, and fortune telling negative. These findings were fairly consistent with theoretical tenets, specifically Beck and colleagues' concept of the negative cognitive triad, including negative thoughts about the self (labeling), future (fortune telling) and world (overgeneralizing) (e.g., Beck et al., 1979), and Ellis' emphasis on depressed clients' tendencies to "awfulize" (use magnification) and use should statements (Ellis, 1980).

The hypothesis that participants would have more negative than positive CEs at early therapy was supported. This result is consistent with theoretical formulations and previous research indicating that the thinking of depressed clients is negatively distorted (Beck et al., 1979; Dobson & Shaw, 1986; Hamilton & Abramson, 1983; Harrell & Ryon, 1983; Hollon et al., 1987; Hollon & Kendall, 1980; Krantz & Hammen, 1979; Krantz & Lui, 1987; Lefebvre, 1981; Michael & Funabiki, 1985; Norman, Miller, & Klee, 1983). These results are consistent with those of Kramer, Bodenmann, and Drapeau (2009), who found that bipolar disorder patients in a depressed mood state had a higher ratio of negative to positive cognitive errors than participants in a manic state, who displayed more positive CEs than did depressed patients.

The curent study also found that for the entire sample, there was no relationship between positive and negative CEs. However, among high and low distorters, there were several instances of positive and negative CEs being significantly correlated. Previous research has been inconsistent in this regard, as

negative and positive distortions have been found to be positively correlated (e.g., Henriques & Leitenberg, 2002), negatively correlated (e.g., Bryant & Baxter, 1997), and uncorrelated (e.g., Mazur, Wolchik, & Sandler, 1992).

**Relationship between CEs and depression at early therapy**

Contrary to previous research findings that depressive symptoms were significantly correlated with cognitive variables such as automatic thoughts (e.g., Dobson & Breiter, 1983; Harrell & Ryon, 1983; Hollon & Kendall, 1980), dysfunctional attitudes (e.g., Dobson & Breiter, 1983), and cognitive errors (e.g., Hammen, 1978; Henriques & Leitenberg, 2002; Lefebvre, 1981; Sato, 2004; Smith, Peck, Milano, & Ward, 1988), the current study found that in most instances, level of depressive symptoms was not related to level of cognitive errors at early therapy. The exception to this was that a significant positive correlation was found for magnification negative and depressive symptoms, and the inverse relationship was found for should and must statements negative and depressive symptoms.

To further investigate these surprising findings, high and low distorters were examined separately to see if group membership made a difference. It was found that even though there were no differences between high and low distorters on their levels of depression before therapy on either their intake BDI or HRSD scores, nor their early (approximately session three) BDI scores, there were some significant correlations between depression and cognitive errors within the two groups. Among low distorters, a greater amount of positive fortune telling was associated with lower levels of depression on the BDI. Among high distorters,

greater levels of depression were associated with having greater total CEs, negative CEs, and negative selective abstraction CEs. High distorters were also found to have lower depression scores being associated with higher levels of positive CEs and positive overgeneralization. While distorting in the positive direction may function as a successful mood-boosting strategy at least in the short term for high distorters, given it was associated with lower levels of depression, the strategy of distorting information, may work against high distorters when negatively valenced information is present, given that negative CEs were associated with greater levels of depression.

**Conclusions**

Based upon the above set of results, several general trends and conclusions may be drawn. Generally speaking, the theoretical tenets of cognitive therapy (e.g., Beck et al., 1979; Ellis, 1980) were supported in that all types of cognitive errors were found in the spontaneous speech of participants with depression. The distortions of labeling negative, should and must statements negative, jumping to conclusions negative, mind-reading negative, overgeneralizing negative, and fortune telling negative, were most prevalent.

The hypothesis that participants would have more negative than positive CEs at early therapy was also supported. No relationship between positive and negative CEs was found at early therapy for the entire sample. However there were few significant correlations among high and low distorters, suggesting that for the most part, depressed participants did not have a general tendency to distort

information, but that distortion was more likely to occur in the negative, rather than in the positive direction.

There were no significant correlations between cognitive errors and levels of depression for the entire sample. However, when low and high distorters were separated, several correlations were found. In particular, among the high distorters, higher levels of negative CEs and lower levels of positive CEs were related to higher levels of depressive symptoms.

**Limitations, strengths, and contribution to knowledge**

The limitations of this research project were that a relatively small sample size may have limited the power to detect additional findings. Also, while the CERS does allow for an assessment of the quantity of CEs, the qualitative properties such as the meaning of CEs to the participant or the emotional valence tied to the CEs could not be assessed. Finally, the methodology did not allow for latent CEs to be assessed. Strengths of this research are that relatively few studies have examined the role of specific cognitive errors in depression, and very little research has employed detailed session coding as a methodology to examine these relationships. Indeed, the majority of the distortion research has used self-report assessment of automatic thoughts and dysfunctional attitudes. Further, much of the research in CBT for depression has focused exclusively on the role of negative distortions. The current study was one of only a few to examine positive cognitive errors. An observer-rated method contributes unique information above what is currently known from studies that have used laboratory settings and self-report instruments. This methodology also allowed cognitive errors to be assessed as

they naturally occurred in the speech of participants, rather than having participants recall the frequency of past thoughts, or estimate how they might be likely to distort in a hypothetical situation. The current study also provided a detailed profile of the frequency of cognitive errors in a sample of depressed participants.

The current study contributes to existing knowledge by offering a more detailed account of the role of both positive and negative cognitive errors in depression, and from a novel perspective, using an observer-rated method. Further, individual differences were highlighted so that group means would not obscure unique findings between groups that may be of clinical utility to practitioners.

**Recommendations for future research and clinical practice**

Directions for future research may include investigating how ratings with the CERS (Drapeau et al., 2008) correlate with other measures of distortion such as the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) or the Dysfunctional Attitudes Scale (DAS; Weissman, 1979), and seeing if participants who are classified as high or low distorters on one scale are classified in the same on the other scales. Another possibility is that the items on both the DAS and the ATQ could be rated with the CERS, so that the specific types of cognitive distortions embedded in these scales could be identified.

Clinical implications from this study are that positive and negative CEs may signal different psychological processes for different people; some people may have a general tendency to distort, while others may selectively distort in the

negative direction. Practitioners may wish to pay greater attention to how positive and negative CEs impact the moods of their depressed clients, as theoretical writings have largely emphasized the role that negative CEs have on mood.

**Table 1: Actual number of Cognitive Errors in an average 50-minute Session of Early Therapy, (*N = 45*)**

| **CE Clusters** | | | | | **Individual CEs** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *%* | *SD* | | *M* | *SD* | *%* | *SD* |
| **Fortune telling** | | | | | | | | | |
| Positive | .11 | .32 | 1.08 | .04 | Fortune Telling (p) | .11 | .32 | 1.10 | .04 |
| Negative | 1.13 | 1.41 | 9.66 | .11 | Fortune Telling (n) | 1.13 | 1.41 | 9.88 | .11 |
| **Overgeneralization** | | | | | | | | | |
| Positive | .18 | .39 | 2.59 | .08 | Labelling (p) | .07 | .25 | .50 | .02 |
| Negative | 2.62 | 2.77 | 24.29 | .20 | Labelling (n) | 1.62 | 2.01 | 14.79 | .15 |
| | | | | | Overgen. (p) | .11 | .32 | 2.15 | .08 |
| | | | | | Overgen. (n) | 1.00 | 1.28 | 10.05 | .12 |
| **Selective Abstraction** | | | | | | | | | |
| Positive | .24 | .57 | 2.18 | .05 | All-or-nothing (p) | .00 | .00 | .00 | .00 |
| Negative | 4.78 | 3.10 | 41.98 | .19 | All-or-nothing (n) | .33 | .56 | 3.22 | .06 |
| | | | | | Discounting (p) | .07 | .33 | .43 | .02 |
| | | | | | Discounting (n) | .13 | .34 | .94 | .03 |
| | | | | | Emot. Reason. (p) | .02 | .15 | .32 | .02 |
| | | | | | Emot. Reason. (n) | .91 | 1.36 | 7.54 | .10 |
| | | | | | Mag./min. (p) | .11 | .32 | 1.12 | .03 |
| | | | | | Mag./min. (n) | .49 | .87 | 4.09 | .07 |
| | | | | | Mental Filter (p) | .00 | .00 | .00 | .00 |
| | | | | | Mental Filter (n) | .22 | .42 | 2.48 | .06 |
| | | | | | Should & must (p) | .00 | .00 | .00 | .00 |
| | | | | | Should & must (n) | 1.22 | 1.13 | 13.18 | .14 |
| | | | | | Tunnel vision (p) | .00 | .00 | .00 | .00 |
| | | | | | Tunnel vision (n) | .09 | .29 | .78 | .02 |
| | | | | | Jump to conclu. (p) | .04 | .21 | .37 | .02 |
| | | | | | Jump to conclu. (n) | 1.38 | 1.42 | 10.7 | 1.11 |
| **Personalizing** | | | | | | | | | |
| Positive | .11 | .32 | 1.58 | .06 | Mind-reading (p) | .07 | .25 | 1.23 | .05 |
| Negative | 1.71 | 1.67 | 14.13 | .11 | Mind-reading (n) | 1.09 | 1.16 | 10.22 | .10 |
| | | | | | Personalization (p) | .02 | .15 | .21 | .01 |
| | | | | | Personalization (n) | .18 | .44 | 1.61 | .04 |
| | | | | | Blame/cred. slf (p) | .02 | .15 | .17 | .01 |
| | | | | | Blame/cred. slf (n) | .40 | .99 | 2.33 | .05 |
| | | | | | Blame/cred. o (p) | .00 | .00 | .00 | .00 |
| | | | | | Blame/cred. o (n) | .04 | .21 | .30 | .01 |

**Table 2:**
**Positive and Negative Cognitive Errors at Early Therapy, (*N = 45*)**

| CEs/1000 words | Positive CEs *Mdn* (range) | Negative CEs *Mdn* (range) | *Z* | Sig. (2-tailed) |
|---|---|---|---|---|
| Total CEs | .00 (.00 – 1.15) | 2.58 (.00 – 10.26) | -5.71 | <.001 |
| **CE Clusters** | | | | |
| Fortune Telling | .00 (.00 - .30) | .28 (.00 – 1.57) | -4.24 | <.001 |
| Overgeneralization | .00 (.00 - .59) | .61 (.00 – 4.06) | -5.17 | <.001 |
| Selective Abstract. | .00 (.00 - .85) | 1.29 (.00 – 6.15) | -5.65 | <.001 |
| Personalizing | .00 (.00 - .86) | .34 (.00 - .2.11) | -4.94 | <.001 |

Note: Wilcoxon signed-rank test.

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## Bridging Manuscript 1 and 2

Manuscript one provided an in-depth analysis of the type and frequency of cognitive errors that may be found in the spontaneous speech of depressed clients during an early session of cognitive therapy. Consistent with theoretical writings (Beck et al., 1979), all types of cognitive errors were present, and there were significantly more negative than positive CEs. Also, there was generally no relationship between the presence of positive and negative CEs, suggesting that people were not likely to have a general distorting tendency, but rather that their thinking was skewed in the negative direction. Further, when people who were considered to be high or low on distortion tendencies were examined as separate groups, negative CEs were associated with higher levels of depression for both groups, but only the high distorters were found to have an inverse relationship between positive CEs and depression.

Together, these findings support the theoretical tenets of cognitive therapy, specifically the prevalence of negatively distorted thinking in depression, and the association between greater levels of CEs and higher levels of depressed mood among high and low distorters. Although support for the efficacy of CBT has been shown in a number of studies (e.g., Butler, Chapman, Forman, & Beck, 2006; Dobson, 1989; Oei & Free, 1995), relatively little is known about how CBT produces these successful outcomes (Kazdin, 2007).

Theoretically, successful treatment should not only alleviate symptoms but also change the underlying factors believed to lead to and sustain depression. Most studies that have examined cognitive changes in depression have assessed

distortion using the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) or the Dysfunctional Attitudes Scale (DAS; Weissman, 1979). It remains to be seen how cognitive errors may change over the course of CBT for depression, and if high and low distorters will be differentially affected.

# CHAPTER 4

## Changes in Cognitive Errors over the Course of Cognitive Therapy for Depression

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**Abstract**

Cognitive therapy (CT) aims to treat Major Depression by helping clients restructure their cognitive distortions (Beck et al., 1979; Dobson & Dobson, 2009). While a few studies have examined changes in automatic thoughts and dysfunctional attitudes following CT, little research has examined changes in cognitive errors (CEs). Forty-five (*N = 45*) participants were drawn from an earlier component analysis study of cognitive therapy (Jacobson et al., 1996; 2000), and all participants were offered 20 sessions of CT. CEs were assessed at early and late therapy using an observer-rated measure of CEs, the Cognitive Errors Rating System (CERS; Drapeau et al., 2008), and depression was assessed every session using the Beck Depression Inventory (BDI; Beck et al., 1979). Results indicated that while the total number of CEs did not change from early to late therapy, negative CEs approached a significant decrease, and positive CEs significantly increased. By late therapy, recovered participants ($n$ = 24) had fewer total CEs, negative CEs, and negative overgeneralization cluster CEs than non-recovered participants ($n$ = 20). For all participants, late therapy negative CEs were positively correlated with level of depression on the BDI. Among the non-recovered participants, late therapy depressive symptoms were inversely related to late therapy positive CEs and positive fortune telling, and positively related to the negative overgeneralization cluster. No significant correlations were found between late BDI scores and late therapy CEs for recovered participants. Research and clinical implications were discussed.

# Changes in Cognitive Errors over the Course of Cognitive Therapy for Depression

## Introduction

According to the cognitive model of depression developed by Beck and colleagues, negative experiences during early life may lead to the production of dysfunctional negative schemas. Schemas are deeply held beliefs which function as filters of external stimuli; information that fits with the schema is retained, and information that does not fit with the schema is disregarded (Beck, Rush, Shaw, & Emery, 1979). Schemas may remain latent and out of conscious awareness until an event occurs that is similar to the event that created the schema. Due to the interactive nature of the environment in the creation of schemas, and its role in the later activation of underlying schemas, the cognitive model is considered to be a stress-diathesis model of depression (Sacco & Beck, 1995).

Once schemas become activated, a person may process environmental stimuli in a distorted way, using a heuristic termed cognitive errors. Cognitive errors are quick ways of processing information that do not take all of the available information into account. As information is selectively attended to, rather than thoughtfully integrated based on a synthesis of all the available information, people may come to develop erroneous, overly negative views about themselves, the world, and the future, termed the negative cognitive triad. This triad leads to the production of automatic thoughts. As such, cognitive errors are involved in the synthesis of material from the environment and deeply held beliefs into the production of conscious distorted ways of thinking. Cognitive errors can

manifest at multiple levels of cognition, reflected in the content of dysfunctional attitudes and automatic thoughts (Kwon & Oei, 1994).

Evidence for the presence of distorted thinking in depression comes from a number of studies that have found a positive correlation between depressive symptoms and cognitive distortions (e.g., Dobson & Breiter, 1983; Harrell & Ryon, 1983; Hammen, 1978; Hollon & Kendall, 1980; Kazdin, 1990; Lefebvre, 1981; Sato, 2004; Smith, Peck, Milano, & Ward, 1988). Additionally, depressed clients have been shown to have higher levels of cognitive distortions than non-depressed controls (e.g., Dobson & Shaw, 1986; Hamilton & Abramson, 1983; Harrell & Ryon, 1983; Hollon & Kendall, 1980; Hollon, Kendall, & Lumry, 1986; Krantz & Hammen, 1979; Krantz & Lui, 1987; Lefebvre, 1981; Michael & Funabiki, 1985; Norman, Miller, & Klee, 1983).

As a fundamental tenet of cognitive therapy (CT) is that the thinking of depressed clients is inaccurate, and that cognitive variables play a role in both the onset and maintenance of depression, cognitive therapist focus on helping clients to identify their cognitive errors, and to gather evidence that will enable them to evaluate the accuracy of their automatic thoughts and dysfunctional attitudes. This enables people to construct a more realistic view of reality that is based on a wider quantity and variety of information, not just that which is schema-driven (Oei & Free, 1995). For example, clients may be shown how to evaluate their thoughts using an automatic thoughts chart. This activity slows down the process of thinking by having clients write out and examine their thoughts on paper. This encourages the identification and questioning of distorted thinking, and illustrates

the impact of distorted thinking on how one feels. Behavioural experiments may also be carefully planned so that clients can gather actual data about the accuracy of their cognitions. Once the data has been obtained, therapists and clients can collaboratively process the meaning of the new data, and determine the impact of this data on the validity of their previously held beliefs. A major goal of this therapy is to help people learn that their thoughts are mental events, which may or may not represent actual facts about reality (Beck, Rush, Shaw, & Emery, 1979).

Cognitive distortions may manifest as negative or positive in valence. There is a moderate level of empirical support indicating that positive thinking is reduced among people with depression, while negative thinking is elevated (for a review see Clark, Beck, & Alford, 1999). Consequently, the clinical literature now indicates the importance of not only restructuring distorted thinking, but also reducing the amount of negative thinking and increasing the amount of positive thinking (Dobson & Dobson, 2009). Dobson and Dobson (2009) emphasize that even positive thinking must remain realistic in nature in order to be clinically beneficial. Other authors have disagreed with this notion, stating that the presence of positive illusions (i.e., positive distortions) may be indicative of good mental health (e.g., Taylor & Brown, 1988). However, this literature has generally been met with criticism (e.g., Colvin & Block, 1994; Colvin, Block, & Funder, 1995; Doan & Gray, 1992). As such, Taylor and colleagues have clarified their perspective, writing that positive illusions may be dangerous at high levels (Taylor & Brown, 1994) and in certain instances, such as when making a decision (Taylor & Gollwitzer, 1995).

Many studies have found support for CBT's effectiveness in the treatment of depression (e.g., Butler, Chapman, Forman, & Beck, 2006; Dobson, 1989; Oei & Free, 1995), including an association between changes in depressogenic cognitions and recovery from depression (e.g., DeRubeis et al., 1990; Furlong & Oei, 2002; Oei & Shuttlewood, 1997; Oei & Sullivan, 1999), as well as the ability of CBT to restore levels of distorted thinking to that of the non-depressed (Kwon & Oei, 2003). For example, in a study of 67 participants who had received 12 weeks of group CBT for depression, recovered participants had fewer automatic thoughts than did participants who did not recover, and had a quicker decline in automatic thoughts than did the non-recovered (Oei & Sullivan, 1999). Change in dysfunctional attitudes did not follow this same pattern, as there were no significant differences between recovered and non-recovered participants on level of dysfunctional attitudes. However, participants who recovered had greater change in dysfunctional attitudes than those who did not, which is consistent with Beck's theory that attitudes are more profound and require longer amounts of time to change (Beck et al., 1979). Other studies by Oei and colleagues have found similar results. For example, one study found that automatic thoughts tend to change sooner than do dysfunctional attitudes (Furlong & Oei (2002), and another study found that automatic thoughts are more highly correlated with changes in depressive symptoms than are dysfunctional attitudes (Oei & Free, 1995).

**The current study**

Although a few studies have investigated changes in cognitive distortions in cognitive therapy, this research has principally focused on changes in automatic

thoughts and dysfunctional attitudes. As such, the goal of the current study was to examine how cognitive errors change from early to late therapy across the course of cognitive therapy for depression. The following hypotheses were tested: (1) negative cognitive errors would decrease from early to late therapy, (2) recovered participants would endorse fewer cognitive errors at the end of therapy than would non-recovered participants, and (3) greater decreases in depression would be positively related to greater decreases in cognitive errors. Also examined was whether participants who were classified as high and low distorters (determined by early therapy CEs) differed from one another on (a) levels of depression at late therapy, (b) levels of cognitive errors at late therapy, and (c) recovery status at end of therapy.

## Method

### Participants

Participants (*N = 45*) were selected from an earlier component analysis study of cognitive therapy (please see Jacobson et al., 1996; 2000). All participants met criteria for Major Depressive Disorder according to the *Diagnostic and Statistical Manual of Mental Disorders* (3rd edition, revised; *DSM—III—R*; American Psychiatric Association, 1987; which is also consistent with the *DSM-IV*), scored greater than 19 on the Beck Depression Inventory (BDI; Beck et al., 1979), and greater than 13 on the 17-item Hamilton Rating Scale for Depression (HRSD; Hamilton, 1967). Participants were excluded from the study if they had a concurrent mental disorder, were currently receiving another type of

psychotherapy or pharmacotherapy, or if they required hospitalization for psychosis or risk of suicide.

The participants were mainly female (78%), and ethnic diversity was as follows: 2 (4.4%) were African Americans, 2 (4.4%) were Asian, 3 (6.7%) were Native American, and 34 (75.6%) were Caucasian; the remaining 4 participants did not report their ethnicity. The mean age of the participants was 39.24 years (range = 21 – 60).

**Therapists**

Four cognitive therapists, whose mean age was 43.5 years (range = 37 – 49), provided manualized cognitive therapy (CT) based on the manual by Beck and colleagues (1979). On average, the therapists had 14.8 years of postdegree clinical experience (range = 7 - 20 years), had been practicing CT for an average of 9.5 years since their formal training (range = 8 - 12 years), and had previously provided psychotherapy in at least one clinical trial of CBT. The therapy sessions were audio-taped and a CT expert (K. Dobson) listened to 20% of the tapes, which were chosen on a random basis. If any deviations from the manual occurred, therapists were immediately notified. Degree of adherence to the treatment manual was also assessed by trained independent raters, and monthly meetings with CT experts were provided for therapists to raise any treatment questions that they might have had.

**Therapy**

Participants were provided with the opportunity to attend 20 sessions of standard cognitive therapy, and attending fewer than 12 sessions was considered a

dropout. Therapy aimed to help clients question and re-think their distorted thoughts, develop more realistic beliefs, and more skilful ways of coping with practical problems.

**Measures**

*Beck Depression Inventory* (*BDI;* Beck et al., 1979) is a frequently used self-report instrument that contains 21 questions to assess depressive symptoms. It has excellent psychometric properties (Beck, Steer, & Garbin, 1988).

*Hamilton Rating Scale for Depression* (HRSD; Hamilton, 1967) is a clinical interview containing 17 items. It has excellent psychometric properties, and is commonly used to assess the severity of depressive symptoms (Clark & Watson, 1991).

*The Cognitive Errors Rating System* (CERS; Drapeau, Perry, & Dunkley, 2008). The CERS is a manualized observer-rated method for the identification of cognitive errors. The manual describes 15 cognitive errors, originally articulated by Beck (1976) and Burns (1999): (1) fortune telling, (2) labeling, (3) overgeneralizing, (4) all-or-nothing thinking, (5) discounting the positive or negative, (6) emotional reasoning, (7) magnification and/or minimization of the negative or positive, (8) mental filter, (9) should and must statements, (10) tunnel vision, (11) jumping to conclusions, (12) mind-reading, (13) personalization, (14) inappropriate blaming/crediting of self while ignoring the roles of others, and (15) inappropriate blaming/crediting of others while ignoring the role of self.

The CERS stipulates that each of these 15 cognitive errors (CEs) may manifest as positive or negative in valence, resulting in a total of 30 different CEs.

The CEs may also be organized into four groups or clusters according to Lefebvre (1981): fortune telling (Cluster A: CE 1), overgeneralization (Cluster B: CEs 2 and 3), selective abstraction (Cluster C: CEs 4 – 11), and personalizing (Cluster D: CEs 12-15). These four clusters may present as either positive or negative in valence, resulting in a total of 8 different clusters.

Given that cognitive errors are present at multiple levels of cognition, including the more accessible automatic thoughts (Beck, 1995), and that the speech of depressed clients tends to be pervasively depressogenic (Beck & Weishaar, 1989, p. 29), this methodology is not likely to require the use of a mood priming activity that is typically necessary to capture latent more cognitions (Segal & Ingram, 1994). As such, the CERS may be used to assess cognitive errors as they occur in a person's speech, allowing the type and frequency of each cognitive error to be determined.

For the current study, one PhD student was trained by the developers of the CERS, and she trained a second PhD student. These two PhD students then trained two additional raters (one PhD student and one MA student). Previous research has established the internal and external validity of the CERS (see D'Iuso, Blake, & Drapeau, 2007; Drapeau & Perry, 2005; Drapeau, Perry, Blake, & D'Iuso, 2007; Perry, Drapeau, Dunkley, Foley, Blake, & Banon, 2007). To assess agreement between the raters for the current study, 18% of cases were rated in consensus. Inter-rater reliability was good: for 30 individual CEs ICC (2,1) = .81, for 15 CEs ICC (2,1) = .78, for 8 clusters ICC (2,1) = .88, for 4 clusters ICC (2,1) = .84, for positive vs. negative CEs ICC (2,1) = .92, and for total CEs ICC

(2,1) = .86. Support for internal and external validity has also been previously reported (see D'Iuso, Blake, & Drapeau, 2007; Drapeau & Perry, 2005; Drapeau, Perry, Blake, & D'Iuso, 2007; Perry, Drapeau, Dunkley, Foley, Blake, & Banon, 2007).

**Procedure**

Twenty sessions of cognitive therapy were offered to the participants. Every session was audio-taped, and sessions three and 19 (or the penultimate session attended by the client) were transcribed into verbatim transcripts. These sessions were then coded by trained independent raters using the Cognitive Errors Rating System (CERS; Drapeau, Perry, & Dunkley, 2008). Names were removed from the transcripts to ensure confidentiality, and session numbers were removed to keep raters blind to therapy session numbers.

Session three was chosen to serve as a measure of early therapy cognitive errors to enhance the chances that therapy would have started due to the completion of early therapy contractual activities (Beck et al., 1979), and that enough time would have passed for the alliance to have formed (Horvath & Luborsky, 1993) and a bond to have been created that would encourage greater disclosure on the part of the client (Rector, Zuroff, & Segal, 1999). Session three was also chosen because session four or later is typically when formal cognitive restructuring techniques are introduced (Ilardi & Craighead, 1994). Penultimate therapy sessions were selected for the assessment of late therapy cognitive errors to allow the assessment to occur as late as possible, but prior to the termination activities that usually take place during the last therapy session.

## Results

### Preliminary analyses

The normality of the variables was assessed using the Shapiro-Wilk test, which is appropriate for samples of less than 50. Results suggested that all CE variables were non-normally distributed, making non-parametric tests the choice for all analyses.

Session three was selected for 44 participants, and session two was selected for one participant based on availability. Late therapy sessions ranged from sessions eight to 19, with the average session being session 17.98 (*SD* = 2.50). The original study by Jacobson and colleagues (1996) assessed levels of depression every session using the BDI, while pre-and post-therapy depression scores were assessed using both the BDI and the HRSD. As such, the current study obtained early and late therapy depression scores from the BDI that corresponded to the session that the cognitive errors had been assessed for on the CERS. In three instances participants were missing BDI scores for the designated session, and data were estimated for those observations based on the next available BDI scores.

Participants spoke an average of 3365.31 words (*SD* = 1488.08) per early session of therapy. By late therapy, participants spoke an average of 3809.78 words (*SD* = 1588.35), which was significantly greater than the amount of words they spoken at early therapy $t(44) = -2.31$, $p = .03$. As such, comparisons are based on CEs per 1000 words.

**Changes in cognitive errors from early to late therapy**

*All participants.* A Wilcoxon signed-rank test revealed that while the total number of CEs did not change from early to late therapy ($Z$ = -.57, $p$ = .57), there were changes in the valence of CEs. Negative CEs approached a significant decrease from early to late therapy ($Z$ = -1.93, $p$ = .05), and there was a significant increase in positive CEs from early to late therapy ($Z$ = -3.19, $p$ = .001). In terms of the CE clusters, the positive clusters of fortune telling, overgeneralization, and selective abstraction increased significantly, while of the negative clusters, only selective abstraction significantly decreased (see Table 1).

[Insert Table 1 about here]

Despite the findings that several positive errors increased and that selective abstraction negative decreased, participants continued to endorse more negative than positive CEs at late therapy, across all comparisons (see Table 2).

[Insert Table 2 about here]

*Recovered vs. non-recovered participants.* Consistent with the original study by Jacobson and colleagues (1996), participants were considered to be recovered if at the end of therapy they had a BDI score less than 9, a HRSD score less than 8, and no longer met criteria for depression using the DSM-III-R. Using these criteria, 24 (53%) participants were classified as recovered, 20 (44%) as non-recovered, and one participant was not classified due to missing data. Using a Mann-Whitney test, differences in cognitive errors between recovered and non-recovered participants were examined. Results indicated that the groups did not

differ from one another at early therapy on any CE variable, but that by the end of therapy, recovered participants had significantly fewer total cognitive errors ($U$ = 150, $p$ = .03), significantly fewer negative errors ($U$ = 143, $p$ = .02), and significantly fewer overgeneralization negative (Cluster B) errors ($U$ = 151, $p$ = .03) (see Table 3).

[Insert Table 3 about here]

Among recovered participants, significant decreases from early to late therapy were observed for total cognitive errors, negative errors, and negative selective abstraction, and significant increases in positive cognitive errors and positive selective abstraction. Non-recovered participants only had significant increases in positive errors and positive fortune telling (see Table 4).

[Insert Table 4 about here]

Despite several positive errors increasing and several negative errors decreasing, participants continued to endorse more negative than positive CEs for all CE variables at late therapy, which was true for both recovered and non-recovered participants. As seen in Table 4, the only exception to this was that the levels of fortune telling negative and fortune telling positive did not differ from one another for recovered participants at late therapy.

**Changes in CEs for high and low distorters**

Participants were divided into high and low distortion groups using a median split of their early therapy total cognitive errors (see Dozois, Covin, & Brinker, 2003). A two-tailed Mann-Whitney test confirmed that the high distortion group endorsed significantly more total cognitive errors ($Mdn$ = 4.74,

range = 2.75 - 10.26), than did the low distorters (*Mdn* = 1.94, range = .00 - 2.57; *U* = .00; *p* < .001). Most of the cognitive errors were negative in valence, as negative CEs differed between the two groups (high distorters: *Mdn* = 4.33, range = 2.59 - 10.26; low distorters: *Mdn* = 1.70, range = .00 - 2.40; *U* = .00; *p* <.001), while positive CEs did not (high distorters: *Mdn* = .00, range = .00 - 1.15; low distorters: *Mdn* = .17, range = .00 - .86; *U* = 233.00; *p* = .62, ns).

Other early therapy differences included high distorters having greater levels of all four negative CE clusters: Fortune telling, overgeneralization, selective abstraction, and personalizing. By late therapy, all these differences disappeared, and both groups did not differ from one another on any CE variable (see Table 5).

[Insert Table 5 about here]

Among participants classified as high distorters, a Wilcoxon signed ranks test indicated that total CEs significantly decreased from early to late therapy (early therapy: *Mdn* = 4.74, range = 2.75 – 10.26; late therapy: *Mdn* = 3.19, range = .54 – 19.82; *Z* = -2.37, *p* = .02), as did negative CEs (early therapy: *Mdn* = 4.33, range = 2.59 – 10.26; late therapy: *Mdn* = 3.09, range = .36 – 19.82, *Z* = -3.13, *p* = .002), and negative selective abstraction (early therapy: *Mdn* = 2.23, range = 1.17 – 6.15; late therapy: *Mdn* = 1.04, range = .00 – 7.93; *Z* = -3.29, *p* = .001). However, positive CEs significantly increased (early therapy: *Mdn* = .00, range = .00 – 1.15; late therapy: *Mdn* = .21, range = .00 – 3.87; *Z* = -2.25, *p* = .03), as did positive overgeneralization (early therapy: *Mdn* = .00, range = .00 - .59; late therapy: *Mdn* = .00, range = .00 - .72; *Z* = -2.09, *p* = .04).

For those who had been classified as low distorters at early therapy, a Wilcoxon signed ranks test indicated that their total number of cognitive errors increased from early to late therapy (early therapy: *Mdn* = 1.94, range = .00 – 2.57; late therapy: *Mdn* = 2.39, range = .99 – 5.11; *Z* = -2.65, *p* = .008). While none of their negative CE clusters significantly decreased, their positive CEs increased (early therapy: *Mdn* = .17, range = .00 - .86; late therapy: *Mdn* = .32, range = .00 – 1.87; *Z* = -2.20, *p* = .03), positive fortune telling increased (early therapy: *Mdn* = .00, range = .00 - .30; late therapy: *Mdn* = .00, range = .00 - .83; *Z* = -2.07, *p* = .04), and positive selective abstraction significantly increased (early therapy: *Mdn* = .00, range = .00 - .30; late therapy: *Mdn* = 06, range = .00 - .63; *Z* = -2.20, *p* = .03).

Additionally, intake distortion status was not related to outcome at the end of therapy. Within the low distorters group, an equal number of participants recovered (n=11) as did not recover (*n*=11). Within the high distorters group, 13 recovered, and nine did not recover, but this difference was not statistically significant (*U* = 58.50, *p* = 1.00) as indicated by a Mann-Whitney test. Recovery status between the two groups was found not to be significantly different (*U* = 220.00, *p* = .55).

**Relationship between CEs and Depressive Symptoms at Late Therapy**

At late therapy, it was found using Spearman one-tailed correlations for the entire group, that total CEs (*r* = .35, *p* = .01) and negative CEs (*r* = .38, *p* = .005) were positively correlated with level of depression on the BDI, as were the following negative CE clusters: fortune telling (*r* = .37, *p* = .007),

overgeneralization ($r$ = .34, $p$ = .01), and personalization ($r$ = .40, $p$ = .004). Correlations between positive CEs and three out of four positive CE clusters were in the inverse direction, but none were statistically significant.

When recovered and non-recovered participants were examined separately, distortion of any kind- whether positively or negatively-valenced, were positively correlated with depression for the recovered participants, while for the non-recovered group, positive CEs and positive CE clusters were inversely related to depression (see Table 6).

[Insert Table 6 about here]

**How change in cognitive errors relates to change in depressive symptoms**

Change in BDI scores and change in cognitive errors were calculated by first subtracting the late scores from the early scores for each construct (using scores from the BDI and CERS), and then correlating the resultant change scores using a one-tailed Spearman correlation. No significant correlations were found between changes in depressive symptoms and any cognitive error variable (i.e., total errors, positive errors, negative errors, or for any of the positive or negative clusters), except for the finding that greater change in BDI was associated with greater change in the overgeneralization negative CE cluster ($r$ = .26, $p$ = .04).

When the group was subdivided into recovered and non-recovered participants, no significant correlations were found between depressive symptoms and any of the CE variables (i.e., total, positive, negative, or clusters) for recovered participants. Among the non-recovered participants, depressive symptoms were inversely related to positive CEs ($r$ = -.58, $p$ = .003) and positive

fortune telling ($r$ = -.39, $p$ = .04), and positively related to the negative overgeneralization cluster ($r$ = .45, $p$ = .02).

## Discussion

Contrary to predictions, the total number of CEs did not change from early to late therapy, but there were changes in the valence of CEs. Negative CEs approached a significant decrease from early to late therapy, and there was a significant increase in positive cognitive errors from early to late therapy. Similar results were found by Hollon, Stewart, and Strunk (2006), who found that increased levels of positive thinking were found among some participants who had received cognitive therapy, but not among those who had received antidepressant medication. The elevated levels of positive thinking found in the study by Hollon and colleagues (2006) exceeded the levels found in normal controls, and placed those participants at greater risk for relapse. To account for those results, the authors speculated that the task of empirical hypothesis testing taught in cognitive therapy may have been practiced as wishful thinking, as opposed to the more difficult task of reality testing. Perhaps a similar phenomenon occurred in the current study.

Results also indicated that recovered and non-recovered participants did not differ from one another on any early therapy CE variable, suggesting that they started therapy with similar distortion tendencies. However, by late therapy, recovered participants had fewer total errors, fewer negative errors, and fewer negative overgeneralization cluster errors than non-recovered participants which

is consistent with theory (Beck et al., 1979), and previous research on automatic thoughts (Kwon & Oei, 2003).

In terms of specific changes within the recovered and non-recovered groups, by late therapy, non-recovered participants only showed increases in positively valenced errors, while recovered participants had both reduced negatively valenced errors, and increased positively valenced errors. The finding that both groups increased their positive errors is inconsistent with theoretical writings articulating that the goal of cognitive therapy is to increase realistic thinking, rather than positive thinking (Beck et al., 1979; Friedman, Thase, & Wright, 2008). However, the finding that recovered participants reduced their negative errors, while non-recovered participants did not, is in line with theoretical assumptions (Beck et al., 1979). These findings may suggest that participants who did not recover had not completely grasped or implemented the concept of cognitive restructuring, perhaps confusing overly positive wishful thinking for realistic thinking, combined with failure to restructure their overly negative thoughts. Another possibility is that the cognitive restructuring techniques may not have been used for cognitive distortions, but instead applied to realistic negative thoughts (Dobson & Dobson, 2009).

Another important finding relates to the persistence of more negative than positive cognitive errors across every category of CEs at late therapy, with the only exception that the levels of fortune telling negative did not exceed, but were equivalent to the levels of fortune telling positive for recovered participants at late therapy. This may suggest that participants who recovered also tended to reduce

their feelings of hopelessness and increase their feelings of hopefulness, which is a key feature in the treatment of depression (Seligman 1972; Seligman, 1991; Seligman, Abramson, Semmel, von Baeyer, 1979).

While the current study assessed positive and negative cognitive errors, the literature suggests that thinking more positively than negatively is associated with better mental health. Schwartz and Garamoni (1986) developed the states of mind (SOM) model, which is a ratio of positive thoughts to the sum of positive and negative thoughts: positive/positive + negative. A ratio of .62 positive to .38 negative thoughts has been coined the Pythagorean golden ratio (Benjafield & Adams-Webber, 1976), reflecting the idea that people inherently think about whole entities in a ratio of .62 positive and .38 negative qualities, which balances the tension between positive and negative aspects. Essentially there is an optimistic background, upon which negative aspects may stand out, so that people can be vigilant towards these aspects in others.

According to the SOM, when both negative and positive thoughts are present, they interact with one another in a dialogue fashion, and when only one valence of thoughts is present, thinking is more of a monologue. Subsequently, the SOM delineates five ranges of thinking defined as: 'negative monologue' (NM; <.31), 'negative dialogue' (ND; .32 to .44), 'internal dialog of conflict' (IDC; .45-.55), 'positive dialogue' (PD; .56-.69), and 'positive monologue' (PM; >.69). Initially it was thought that the greater degree of negative thinking, the greater a person's level of psychological dysfunction. However, among the more positive thought ratios (PD and PM), positive dialogue is considered to be

optimal, because the extremely positive perspective of 'positive monologue' may involve ignoring important, though negative aspects of reality. However, at the low end of positive monologue (.70-.80) adaptive results have been found depending on the type of task employed (for a review see Bruch, 1997).

Bruch (1997) examined the SOM theory in a sample of college students, and found that the relationship between negative life events and dysphoria was stronger among the more negative thinkers than it was for the more positive thinkers. However, contrary to predictions that the positive dialoguers would best buffer the effects of negative life events on dysphoric mood, it was the extremely positive thinkers, that is those engaging in positive monologues, whose mood was least impacted by negative events. This finding is significant because it had been hypothesized that the level of inattention to negative information made by the positive monologues was maladaptive. However, under high amounts of stress, it was the positive dialoguers, and not the positive monologuers who were beginning to approach dysphoria. Overall, this study did support the idea that cognitions may moderate the relationship between life events and feelings of dysphoria.

One difficulty in extrapolating these findings to the current study is that the SOM model is about the relative frequency of positive and negative thoughts, which is not the same as positive and negative errors. For example, if a person had a pattern of positive thoughts, it does not necessarily mean that their thinking was distorted, nor that reality really was that positive. The defining feature of positive distortions is incongruence with reality.

Another line of thinking about the role of cognitive errors in mental health comes from Teasdale and colleagues (2001), who stated that cognitive therapy has traditionally emphasized reducing distorted thinking as a means towards reducing negative thought content, rather than as a valuable process in its own right. However, their research indicated that the way participants answered questionnaires -specifically the tendency to answer using extreme ends of the scales ("totally agree" or "totally disagree") was found to mediate the relationship between cognitive therapy and relapse, while negative content on the questionnaires did not. "Extreme responding" was thought to reflect a cognitive mode based on automaticity, rather than a cognitive mode of controlled, thoughtful, reflection. They concluded that "these shifts of cognitive mode [from automatic to reflective], rather than being merely the means to the end of changing belief, may actually be the primary mechanism through which the relapse prevention effects of CT are achieved" (Teasdale et al., 2001, p. 357). As such, both positive and negative distortions could be indicative of a tendency to use an automatic rather than a reflecting cognitive mode.

Cognitive mode may play a larger role in the development of depression than thought content, because negative thought content may always occur, but how one deals with it may make the difference between becoming depressed or not. Barber and DeRubeis (1989) have suggested that the success of cognitive therapy may lie in the capacity of clients to learn how to reappraise depressive cognitions, which they referred to as the development of compensatory skills. As such, one could extrapolate that the tendency to distort, even positively, may not

be linked with good mental health, as it would reflect an underlying mode of automaticity. Kinney (2000) writes that it is a matter of degree:

> "Rather than view positive illusions as processes to be "nurtured and promoted..." as suggested by Taylor & Brown (1988, p. 205), it may prove more valuable for the cognitive therapist to focus on the degree of distortion; to view extreme instances of positive illusions as signaling the presence of underlying irrational beliefs, e.g., "musts" about the self. That mild positive illusions appear to enhance the self-concept may not prove to be of primary importance to cognitive therapists. More importantly, issues regarding underlying primary motives for engaging in these self-deceptive behaviours may be of greater clinical significance, especially at excessive levels" (Kinney, 2000, p. 409).

**Changes from early to late therapy for high and low distorters**

Previous research has indicated that people with lower levels of pre-treatment cognitive distortions have responded better to CBT (e.g., Jarrett, Eaves, Brannemann, & Rush, 1991; Keller, 1983; Sotsky et al, 1991). In contrast, the current study found that high and low distorters (defined at intake) did not differ from one another on any late therapy cognitive error variable, nor did they differ in their recovery rates, nor their end of therapy depression scores on the BDI or HRSD. The difference between the current study and previous research findings may be due to the fact that the current study measured cognitive errors, while these previous studies measured dysfunctional attitudes, which may reflect deeper, more rigid constructs which are less amenable to change.

Participants who began therapy with a high level of distortion decreased their overall number of CEs from early to late therapy. However, despite a decrease in their negatively valenced CEs, their positively valenced CEs increased. Among participants initially classified as low distorters, their total number of cognitive errors actually became higher at late therapy than what it was at early therapy. While none of their negative CE clusters significantly decreased, their positive CEs increased, as did their positive fortune telling, and positive selective abstraction. Again, the findings that positive errors in both groups increased, points to the notion that cognitive restructuring may not have been well understood or applied by the participants.

The finding that low distorters by definition started out thinking somewhat realistically, but ended up increasing their levels of positive errors, might suggest that a therapeutic emphasis on cognitive restructuring resulted in participants substituting realistic negative thoughts for unrealistic positive ones. Perhaps a greater focus assessing the validity of cognitions within the context of a person`s life before attempting to restructure thoughts could circumvent this pitfall. This notion has been previously discussed in the literature by Krantz (1985) who stated that “Stable depressive rules (e.g., "I don't deserve a good life") may be associated with the onset and maintenance of depression in the relative absence of undesirable circumstances” (p. 605) whereas other seemingly distorted thoughts may actually reflect negative realities. For example, “negative expectations of the future may be reasonable projections from the available information about the current negative situation. For instance, it is unlikely that a black 19-year-old

single mother on welfare will break into the middle class. Her pessimism about improvement in socioeconomic status is congruent with the available data on the upward mobility of persons in her situation" (p. 601).

In the above example, Krantz (1985) distinguished between depressive thinking that does not rely on external information from depressive thinking that is dependent on contextual information. Krantz stated that "as suggested by a reciprocal influence model, the current focus on negative information does not imply that a stable cognitive schema or other factors are unimportant or less important than information about reality. Indeed, the continuous interplay between cognitions and reality is likely to be limited to a particular subset of cognitions: the individual's inferences about reality" (p. 605). She therefore recommended that "cognitive theory and practice could benefit by expanding the causal model to include the information from the environment. While it is undoubtedly true that depressives fail to see that "every cloud has a silver lining," it also appears that depressives have more clouds on their horizons than do nondepressives" (p. 607-608).

To address these actual 'clouds on the horizon', Krantz (1985) pointed to the success of cognitive therapy in terms of increasing behavioural skills. To this she added that greater emphasis could be placed on considering the wider social context, and addressing social problems at the level where they occur, for example by encouraging clients living in negative social surroundings to join new, more supportive community organizations. In a recent book by Dobson and Dobson (2009), the authors debunk an outdate myth that context is neglected in

CBT, writing that "it is unfair to argue that cognitive behavioural therapists ignore extrapsychic factors in the development, maintenance, and treatment of these problems... Therapists are expected to consider problems such as poverty or domestic violence when they develop a case formulation. On the other hand, the cognitive model, just like many other primarily "intrapsychic" models, does focus on processes within clients" (p. 251-252).

However, another possibility is that as low and high distorters were extreme groups, it is possible that there was some regression towards the mean, which may account for the increased levels of CEs among the low distorters, and the decreased levels of CEs among the high distorters.

**Relationship between CEs and depressive symptoms at late therapy**

At late therapy, it was found that greater total CEs, negative CEs, and the negative clusters of fortune telling, personalization, and overgeneralization were associated with greater levels of depression on late therapy BDI questionnaires. Correlations between three out of four positive CE clusters were in the inverse direction, but none were statistically significant. It is curious that at early therapy depressive symptoms were not correlated with negative CEs, but at the end of therapy they were.

To examine these relationships further, recovered and non-recovered participants were examined separately. It was found that overall levels of cognitive distortions were associated with greater levels of depression for the recovered participants, while for the non-recovered group, positive CEs and positive CE clusters were associated with reduced levels of depression. These

findings suggest that among recovered participants, who presumably understood the process of cognitive restructuring, distorted thinking, regardless of the valence, was associated with depression. Among non-recovered participants, it seems that positive distortions were used in an attempt to reduce depressive thinking and boost one's mood, but that this strategy was not enough to remit their depression. This pattern is consistent with theoretical formulations emphasizing the important of reducing negatively distorted thinking (Beck et al., 1979).

**How change in cognitive errors relates to change in depressive symptoms**

When examining the entire sample, no significant correlations were found between change in depressive symptoms on the BDI and change in any cognitive error variable, except for the finding that greater change in depressive symptoms was associated with greater change in the overgeneralization negative cluster. These findings may reflect a non-linear relationship between cognitive errors and depressive symptoms. For example, Hollon, Stewart, and Strunk (2006) found a curvilinear relationship between cognitive changes and later relapse among clients who had received cognitive therapy, which was associated with increased levels of positive thinking. Among participants in their study who had received antidepressant medication, a pattern of increased positive thinking was not obtained, and a linear relationship was found between cognitive changes and relapse. Based on the findings by Hollon, Stewart, and Strunk (2006), regression curve estimation scatterplots were computed. However, no models fit the data, indicating that there was neither a linear nor non-linear relationship between

change in cognitive errors and change in depressive symptoms from early to late therapy.

When correlations between change in depressive symptoms on the BDI and change in cognitive errors on the CERS were repeated taking recovery status into account, it was found that among the non-recovered participants, change in depressive symptoms was inversely related to positive CEs and positive fortune telling, and positively related to negative overgeneralization. No significant correlations were found between change in depressive symptoms and change in any of the CE variables for recovered participants. The finding that there were significant correlations for the non-recovered participants but not the recovered participants, may suggest that negative reactivity decreased for the recovered participants, allowing them to "unlink" negative thoughts from depressive symptoms. This unlinking process is thought to prevent a negative downward spiral from one negative thought to many when in a sad mood state. The reduction of negative reactivity often seen in cognitive therapy but not in pharmacotherapy is thought to account for the superior relapse rates achieved by cognitive therapy (Feldman, 2007).

**Conclusions**

The hypothesis that participants would have more negative than positive CEs at early therapy was supported; however this pattern was still present at late therapy for both recovered and non-recovered patrticipants. The only exception to this finding was that positive and negative fortunte telling did not differ for

recovered particiapnts at late therapy, perhaps suggesting that recovered participants developed more hopefullness about the future.

Contrary to hypotheses, there was only a trend towards CT decreasing negative CEs for the entire group. However, while both recovered and non-recovered participants increased their positive CEs, only the recovered group decreased their negative CEs, suggesting that a reduction in negative distortions was related to outcome. It is not clear if an increase in positive distortions was helpful, as higher levels of positive distortions were associated with higher levels of depression for recovered participants, but lower levels of depression for non-recovered participants. However, as it is probably more desirable to be recovered than not, it seems as if an increase in positive errors may not be useful, given that it was associated with higher levels of depression for recovered participants.

Several hypotheses are offered to account for the increase in positive CEs. It is possible that participants misunderstood the idea of cognitive therapy, or were unable to sufficiently translate the concept of cognitive restructuring into actual thinking practices. Possibly therapists unintentionally evoked a positive bias in clients. Third, when learning a new skill, perhaps people tend to over-compensate before adjusting to a new baseline, like learning to ride a bike and pressing too hard on the brakes until the requisite force is determined. Perhaps an increase in positive CEs was captured during this adjustment period. Finally, some seemingly distorted thoughts were actually reflecting negative realities, and were re-structured into overly positive thoughts despite not having been inaccurate in the first place (e.g., Krantz, 1985).

It was also observed that recovered and non-recovered participants did not differ from one another on any early therapy CE variable, suggesting that they started therapy with similar distortion tendencies. However, by late therapy recovered participants had fewer total errors, fewer negative errors, and fewer negative overgeneralization than non-recovered participants. This suggests that a contributing factor to their differences in recovery rates may be their levels of cognitive errors at late therapy.

Contrary to predictions, change in depressive symptoms was not associated with change in cognitive errors for the whole sample, nor for recovered participants. There were however a couple of significant correlations for non-recovered participants. These findings may be due to an "unlinking" effect, whereby recovered participants learned to separate out distortions from mood, perhaps indicating decreases in negative reactivity.

Finally, it was observed that high and low distorters did not differ from one another on depression scores at early therapy, suggesting that a greater tendency to distort was not associated with feeling more depressed. While high distorters displayed greater levels of cognitive errors at early therapy, this difference was no longer apparent by late therapy, and the two groups did not differ in their recovery rates. Thus, the results suggest that both groups did not differ in their ability to benefit from the treatment.

One limitation of this study was that a relatively small sample size may have limited the power to detect additional findings, especially since the positive CEs were so few in number. Another limitation is that the high and low distortion

groups were so classified based on their relation to one another, as opposed to a more objective external criterion. The strengths of this research are that it contributes additional knowledge to the CT literature, as the majority of studies have examined the role of automatic thoughts and dysfunctional attitudes but not the role of cognitive errors in depression. Further, this research assessed cognitive errors during early and late therapy sessions, which allowed for a natural assessment of cognitive errors as they spontaneously occurred, which provided a unique perspective beyond studies that have used self-report measures or laboratory experiments. Another strength of this research is that is it one of only a few studies that have examine the role of positive errors in depression.

The analysis of actual therapy data contributes to the growing body of knowledge about cognitive therapy by providing empirical evidence about the type and frequency of cognitive errors that may be found in the speech of depressed clients, and providing evidence about how these errors changed over the course of therapy. The significance of the relationships between cognitive errors and depressive symptoms provides additional support to previous research on the value of promoting reflective rather than automatic thinking, and the related importance of learning to 'unlink' negative thought content from negative emotional processes.

**Recommendations for clinical practice**

Given the finding that positive CEs increased, therapists may wish to more closely examine their own personal biases and help clients to do the same, so that negative realities are not ignored and minimized by "positive thinking".

Additional vigilance towards the appearance of positive errors may lead to greater rates of recovery given the finding that non-recovered participants developed additional positive errors, without also reducing their negative errors.

It must be emphasized that the research indicating that non-depressed thinking is slightly more positive than negative is not equivalent to the ignoring of negative thoughts and feelings, and distorting things in a positive way. Clinically, these distinctions should be explored with clients to ensure that they are able to acknowledge both negative and positive thoughts and feelings, and then to focus on the positive, while still being realistic. For example, Dobson and Dobson (2009) suggest that a positive outlook may be possible even for seemingly negative situations, such as the negative consequences that occur when a mother worries too much about the welfare of her children, which tends to aggravate them. These authors state that "it is sometimes possible to see the positive aspects of negative thoughts and to reframe or restate the thought from this perspective (e.g., "I worry about my children because I care about them") (p. 139-140). Dobson and Dobson (2009) highlight how important it is for therapists to help clients reframe their thoughts in a realistic way, as unrealistic optimism may not seem credible to the client, may not fit with their world view, or may minimize their distress. Another implication for the provision of therapy is that some clients may be relatively realistic in their thinking (e.g., "low distorters"), in which case a focus on cognitive restructuring may not be as pertinent as some of the other behavioural or problem-solving interventions that are also a component of cognitive therapy.

Overall, this research has shown support for the theoretical tenets for cognitive therapy, which remains one of the most widely used and highly effective psychological treatments for the debilitating problem of depression. The findings of this study have added several nuances to the cognitive approach, by placing an emphasis on the importance of investigating the role of both positive and negative distortions on mood and recovery from depression, the importance of tailoring the cognitive interventions to the realities of the client's life, and the importance of assessing exactly how clients are applying to cognitive restructuring strategies to their thoughts. Further, this research lends support to the notion that the benefit of restructuring distortions resides in the capacity to increase reflective as opposed to automatic thinking.

**Recommendations for future research**

Throughout the data analysis, it was seen that analyzing group means did not always yield a clear picture of the underlying psychological processes. Important individual differences including intake factors such as distortion status, as well as end of treatment factors like recovery status yielded more meaningful results, and future research may be enhanced by continuing along this vein. Future process research could focus on examining additional therapist and client processes, for examine, investigating the hypothesis that therapists may be unintentionally "pulling" for positive distortions, or the hypothesis that participants may be relying on positive wishful thinking, as opposed to the more complicated task of reality testing their cognitions. Finally, longitudinal research

may be useful to determine the long-term impact of positive and negative CEs on recovery from depressive.

**Table 1:**
**Changes in Cognitive Errors per 1000 words from Early to Late Therapy for All Participants (*N = 45*)**

| CEs/1000 words | Early therapy *Mdn* (range) | Late therapy *Mdn* (range) | *Z* | Sig. (2-tailed) |
|---|---|---|---|---|
| Total CEs | 2.75 (.00 – 10.26) | 2.69 (.54 – 19.82) | -.57 | .57 |
| Positive Errors | .00 (.00 – 1.15) | .32 (.00 – 3.87) | -3.19 | .001 |
| Fortune Telling | .00 (.00 - .30) | .00 (.00 - .83) | -2.56 | .01 |
| Overgeneralization | .00 (.00 - .59) | .00 (.00 - .72) | -2.37 | .02 |
| Selective Abstract. | .00 (.00 - .85) | .00 (.00 - .63) | -2.34 | .02 |
| Personalization | .00 (.00 - .86) | .00 (.00 – 3.09) | -.80 | .42 |
| Negative Errors | 2.58 (.00 – 10.26) | 2.24 (.36 – 19.82) | -1.93 | .05 |
| Fortune Telling | .28 (.00 – 1.57) | .20 (.00 – 1.98) | -.17 | .87 |
| Overgeneralization | .61 (.00 – 4.06) | .62 (.00 – 2.97) | -.33 | .74 |
| Selective Abstract | 1.29 (.00 – 6.15) | .68 (.00 – 7.93) | -2.95 | .003 |
| Personalization | .34 (.00 – 2.11) | .41 (.00 – 6.94) | -.03 | .97 |

Note: Wilcoxon Signed-Rank test.

**Table 2:**
**Comparisons between Positive and Negative Cognitive Errors per1000 words at Late Therapy**

| CEs/ 1000 words | Positive CEs *Mdn* (range) | Negative CEs *Mdn* (range) | *Z* | Sig. (2-tailed) |
|---|---|---|---|---|
| **All participants (*N = 45*)** | | | | |
| Total errors | .32 (.00 – 3.87) | 2.24 (.36 – 19.82) | -5.10 | <.001 |
| Fortune Telling | .00 (.00 - .83) | .20 (.00 – 1.98) | -3.04 | .002 |
| Overgeneralization | .00 (.00 - .72) | .63 (.00 - 2.97) | -4.18 | <.001 |
| Selective Abstract. | .00 (.00 - .63) | . 68 (.00 – 7.93) | -4.58 | <.001 |
| Personalization | .00 (.00 - 3.09) | .41 (.00 – 6.94) | -3.98 | <.001 |
| **Recovered (*n* =24)** | | | | |
| Total errors | .59 (.00 – 3.87) | 1.71 (.36 – 5.31) | -3.17 | .002 |
| Fortune Telling | .00 (.00 - .43) | .09 (.00 - .85) | -1.78 | .08 |
| Overgeneralization | .13 (.00 - .72) | .45 (.00 – 2.39) | -2.17 | .03 |
| Selective Abstract. | .06 (.00 - .63) | .55 (.00 – 3.10) | -3.02 | .003 |
| Personalization | .00 (.00 – 3.09) | .26 (.00 – 1.29) | -2.25 | .03 |
| **Non-recovered (*n* = 20)** | | | | |
| Total errors | .22 (.00 – 1.87) | 2.58 (.58 – 19.82) | -3.74 | <.001 |
| Fortune Telling | .00 (.00 - .83) | .39 (.00 – 1.98) | -2.20 | .03 |
| Overgeneralization | .00 (.00 - .72) | .89 (.00 – 2.97) | -3.58 | <.001 |
| Selective Abstract. | .00 (.00 - .54) | .96 (.00 – 7.93) | -3.34 | .001 |
| Personalization | .00 (.00 - .42) | .59 (.00 – 6.94) | -3.30 | .001 |

Note: Wilcoxon signed-rank test.

**Table 3:**
**CEs/1000 words in Non-Recovered and Recovered Participants**

| CEs/1000 words | Non-recovered *Mdn* (range) ($n$ = 24) | Recovered *Mdn* (range) ($n$ = 20) | *U* | Sig. (2-tailed) |
|---|---|---|---|---|
| **Early Therapy Distortions** | | | | |
| Total Errors | 2.40 (.00 - 10.26) | 2.92 (1.10 - 9.04) | 219.00 | .62 |
| Positive Errors | .00 (.00 - .59) | .00 (.00 - 1.15) | 231.00 | .81 |
| Negative Errors | 2.28 (.00 - 10.26) | 2.67 (1.10 - 8.74) | 227.00 | .76 |
| **Positive Clusters** | | | | |
| Fortune Telling | .00 (.00 - .18) | .00 (.00 - .30) | 221.50 | .38 |
| Overgeneralization | .00 (.00 - .39) | .00 (.00 - .59) | 184.50 | .05 |
| Selective Abstract. | .00 (.00 - .50) | .00 (.00 - .29) | 229.00 | .70 |
| Personalization | .00 (.00 - .59) | .00 (.00 - .86) | 225.00 | .52 |
| **Negative Clusters** | | | | |
| Fortune Telling | .29 (.00 - .97) | .23 (.00 - 1.57) | 239.50 | .99 |
| Overgeneralization | .63 (.00 - 3.08) | .59 (.00 - 4.06) | 228.00 | .78 |
| Selective Abstract. | .93 (.00 - 6.15) | 1.37 (.00 - 3.38) | 196.00 | .30 |
| Personalization | .43 (.00 - 1.47) | .32 (.00 - 2.11) | 210.00 | .48 |
| **Late Therapy Distortions** | | | | |
| Total Errors | 3.56 (.58 - 19.82) | 2.39 (.54 - 6.96) | 150.00 | .03 |
| Positive Errors | . 22 (.00 - 1.87) | .59 (.00 - 3.87) | 215.00 | .55 |
| Negative Errors | 2.58 (.58 - 19.82) | 1.71 (.36 - 5.31) | 143.00 | .02 |
| **Positive Clusters** | | | | |
| Fortune Telling | .00 (.00 - .83) | .00 (.00 - .43) | 228.00 | .73 |
| Overgeneralization | .00 (.00 - .72) | .13 (.00 - .72) | 194.50 | .24 |
| Selective Abstract. | .00 (.00 - .54) | .06 (.00 - .63) | 227.00 | .74 |
| Personalization | .00 (.00 - .42) | .00 (.00 - 3.09) | 224.50 | .59 |
| **Negative Clusters** | | | | |
| Fortune Telling | .39 (.00 - 1.98) | .09 (.00 - .85) | 164.00 | .06 |
| Overgeneralization | .89 (.00 - 2.97) | .45 (.00 - 2.39) | 151.00 | .03 |
| Selective Abstract. | .96 (.00 - 7.93) | .55 (.00-3.10) | 188.00 | .22 |
| Personalization | .59 (.00 - 6.94) | .26 (.00 - 1.29) | 175.00 | .12 |

Note: Mann-Whitney test.

**Table 4:**
**Changes in Cognitive Errors per 1000 words from Early to Late Therapy for Recovered and Non-Recovered Participants**

| CEs/1000 words | Early therapy *Mdn* (range) | Late Therapy *Mdn* (range) | *Z* | Sig. (2-tailed) |
|---|---|---|---|---|
| **Recovered participants** (*n* = 24) | | | | |
| Total CEs | 2.92 (1.10 - 9.04) | 2.39 (.54 – 6.96) | -2.40 | .02 |
| Positive Errors | .00 (.00 - 1.15) | .59 (.00 – 3.87) | -2.84 | .005 |
| Fortune Telling | .00 (.00 - .30) | .00 (.00 - .43) | -1.68 | .09 |
| Overgeneralization | .00 (.00 - .59) | .13 (.00 - .72) | -1.70 | .09 |
| Selective Abstraction | .00 (.00 - .29) | .06 (.00 - .63) | -2.83 | .005 |
| Personalization | .00 (.00 - .86) | .00 (.00 – 3.09) | -.94 | .35 |
| | | | | |
| Negative Errors | 2.67 (1.10 – 8.74) | 1.71 (.36 – 5.31) | -3.31 | .001 |
| Fortune Telling | .23 (.00 – 1.57) | .09 (.00 - .85) | -1.50 | .13 |
| Overgeneralization | .59 (.00 – 4.06) | .45 (.00 - 2.39) | -1.61 | .11 |
| Selective Abstraction | 1.37 (.00 – 3.38) | .55 (.00 – 3.1) | -3.60 | <.001 |
| Personalization | .32 (.00 – 2.11) | .26 (.00 – 1.29) | -.71 | .48 |
| | | | | |
| **Non-recovered participants** (*n* = 20) | | | | |
| Total CEs | 2.40 (.00 – 10.26) | 3.56 (.58 - 19.82) | -1.76 | .08 |
| Positive Errors | .00 (.00 - .59) | .22 (.00 – 1.87) | -2.10 | .04 |
| Fortune Telling | .00 (.00 - .18) | .00 (.00 - .83) | -2.20 | .03 |
| Overgeneralization | .00 (.00 - .39) | .00 (.00 - .72) | -1.68 | .09 |
| Selective Abstraction | .00 (.00 - .50) | .00 (.00 - .54) | -1.48 | .14 |
| Personalization | .00 (.00 - .59) | .00 (.00 - .42) | -.11 | .92 |
| | | | | |
| Negative Errors | 2.28 (.00 – 10.26) | 2.58 (.58 - 19.82) | -.90 | .37 |
| Fortune Telling | .29 (.00 - .97) | .39 (.00 – 1.98) | -.93 | .36 |
| Overgeneralization | .63 (.00 – 3.08) | .89 (.00 – 2.97) | -1.42 | .16 |
| Selective Abstraction | .93 (.00 – 6.15) | .96 (.00 – 7.93) | -.52 | .60 |
| Personalization | .43 (.00 – 1.47) | .59 (.00 – 6.94) | -.56 | .57 |

Note: Wilcoxon Signed-Rank test.

**Table 5:**
**Depression and CEs per 1000 words in High vs. Low Distorters (*N = 45*)**

| CEs/1000 words | High distorters (*n* = 23) *Mdn* (range) | Low distorters (*n* = 22) *Mdn* (range) | *U* | Sig. (2-tailed) |
|---|---|---|---|---|
| **Early Therapy Depression** | | | | |
| Pre-BDI | 29.40(20.00-46.00) | 29.50(17.00–44.00) | 244.50 | .85 |
| Pre-HRSD | 18.00(12.75-37.00) | 20.00(13.00–24.44) | 178.50 | .09 |
| Early BDI | 19.00(15.00-43.00) | 22.50(7.00-49.35) | 248.00 | .91 |
| **Early Therapy Distortions** | | | | |
| Total Errors | 4.74(2.75-10.26) | 1.94(.00-2.57) | .00 | <.001 |
| **Positive Errors** | .00(.00-1.15) | .17(.00-.86) | 233.00 | .62 |
| Fortune Telling | .00(.00-.29) | .00(.00-.30) | 241.50 | .63 |
| Overgeneralization | .00(.00-.59) | .00 (.00-.39) | 234.00 | .52 |
| Selective Abstraction | .00(.00-.85) | .00(.00-.30) | 246.50 | .83 |
| Personalization | .00(.00-.59) | .00 (.00-.86) | 243.00 | .68 |
| **Negative Errors** | 4.33(2.59-10.26) | 1.70(.00-2.40) | .00 | <.001 |
| Fortune Telling | .35(.00 -1.57) | .00 (.00-.73) | 135.50 | .006 |
| Overgeneralization | 1.13(.00-4.06) | .41 (.00-1.17) | 127.50 | .004 |
| Selective Abstraction | 2.23(1.17-6.15) | .71 (.00-1.54) | 8.00 | <.001 |
| Personalization | .70(.00-2.11) | .22 (.00-.88) | 90.00 | <.001 |
| **Late Therapy Depression** | | | | |
| Post-BDI | 6.00(.00-33.00) | 7.00(.00-42.00) | 242.00 | .80 |
| Post-HRSD | 5.00(.00 - 32.00) | 6.00(.00-20.00) | 232.50 | .82 |
| Late BDI | 9.00(.00-43.00) | 11.50(.00-44.00) | 248.50 | .92 |
| **Late Therapy Distortions** | | | | |
| Total Errors | 3.19(.54-19.82) | 2.39(.99-5.11) | 171.00 | .06 |
| **Positive Errors** | .21(.00-3.87) | .32(.00-1.87) | 237.00 | .71 |
| Fortune Telling | .00(.00-.71) | .00(.00-.83) | 222.00 | .39 |
| Overgeneralization | .00(.00-.72) | .06(.00-.49) | 239.00 | .73 |
| Selective Abstraction | .00(.00-.57) | .06(.00-.63) | 232.00 | .60 |
| Personalization | .00(.00-3.09) | .00(.00-.42) | 230.00 | .43 |
| **Negative Errors** | 3.09(.36-19.82) | 2.15(.40-5.09) | 192.00 | .17 |
| Fortune Telling | .36(.00-1.98) | .20(.00-1.60) | 206.50 | .28 |
| Overgeneralization | .53(.00-2.97) | .63(.00-1.36) | 240.00 | .77 |
| Selective Abstraction | 1.04(.00-7.93) | .45(.00-3.05) | 183.00 | .11 |
| Personalization | .42(.00-6.94) | .40(.00-1.62) | 226.00 | .54 |

Note: Mann-Whitney test. Unequal *n*'s in recovery status due to missing data.

**Table 6:**
**Spearman one-tailed Correlations between Late Therapy Depressive Symptoms and Cognitive Errors per 1000 words**

| CEs/1000 words | All participants (*N = 45*) | | Recovered (*n* = 24) | | Non-recovered (*n* = 20) | |
|---|---|---|---|---|---|---|
| **Late Treatment CEs** | BDI | Sig. | BDI | Sig. | BDI | Sig. |
| Total Ces | .35 | .01 | .45 | .01 | -.05 | .42 |
| **Positive CEs** | -.11 | .23 | .44 | .02 | -.50 | .01 |
| Fortune Telling | -.16 | .14 | .21 | .17 | -.52 | .01 |
| Overgeneralization | -.18 | .12 | .16 | .23 | -.46 | .02 |
| Selective Abstraction | -.08 | .29 | .19 | .19 | -.32 | .08 |
| Personalization | .07 | .33 | .23 | .14 | -.10 | .34 |
| **Negative CEs** | .38 | .005 | .33 | .06 | .16 | .25 |
| Fortune Telling | .37 | .007 | .38 | .03 | .18 | .22 |
| Overgeneralization | .34 | .01 | .15 | .25 | .24 | .15 |
| Selective Abstraction | .07 | .33 | .06 | .40 | -.07 | .39 |
| Personalization | .40 | .004 | .33 | .06 | .36 | .06 |

Note: Unequal *n*'s due to missing data.

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## Bridging Manuscripts 2 and 3

Cognitive behavioral therapy (CBT) adheres to a stress-diathesis model of depression, as the presence of stress combined with a cognitive vulnerability is implicated in the etiology and maintenance of depression (Sacco & Beck, 1995). Concurrently, researchers have argued that the ways individuals deal with stress (i.e., coping patterns or CPs) can amplify or reduce the effects of these events (Skinner, Edge, Altman, & Sherwood, 2003). Theoretically, cognitive behavioral therapies treat depression by helping clients to reduce their cognitive vulnerabilities and developing more adaptive coping patterns (Oei & Free, 1995).

Perhaps because researchers have emphasized the role of cognition in the etiology and maintenance of depression, the effects of therapy on specific coping strategies have been largely neglected. For example, in a recent study, Chu and Harrison (2007) reviewed the effects of CBT on depressed adolescents. Studies met their inclusion criteria if they incorporated a measure of treatment outcome as well as at least one theory-specific target variable (e.g., a measure of behavioral, cognitive, physiological, or coping variable). Of the 14 studies that met their criteria, the majority had cognitive outcomes (71%), a smaller percentage had assessed behavioral outcomes (50%), even fewer had assessed coping processes (14%), and none had assessed physiological outcomes. Surprising, only one measure of coping was used across the studies. Among adult samples, changes in coping variables are rarely reported, even among CBT studies that aim to target coping explicitly. For example, Kuehner (2005) conducted a study using the Coping with Depression Course (CWD; Lewinsohn, Antonuccio, Steinmetz, &

Teri, 1984), which "incorporates traditional CBT elements such as self-modification, relaxation, increasing pleasant activities, cognitive restructuring, and social competence training. The emphasis of the program is on active coping and preventive measures rather than on treatment" (Kuehner, 2005, p. 255). Yet coping was not assessed, as the outcome measures consisted of a measure of psychopathology, a measure of depression, a German version of the Dysfunctional Attitudes Scale (DAS), and a measure of pleasant activities.

Similarly, Cuijpers (2000) conducted a meta-analysis of 20 studies that used the Coping with Depression Course. The effectiveness of the therapy was evaluated on the basis of Beck Depression Inventory change scores (pre-test and post-test), and overall treatment effect size. Again, similar results were found for the Cognitive-Behavioral Analysis System of Psychotherapy. This therapy is a standardized treatment for dysthymia developed by McCullough, which "directly attacks the helplessness and hopelessness plight of the dysthymic and teaches adaptive coping skills" (McCullough, 1991, p. 734). McCullough (1991) published a study on 10 naturalistic cases, and in terms of coping, it was only reported that of the nine participants who recovered, "they did state that stressors were present in daily living, but that the situational evaluation and coping skills they learned in therapy provided the necessary tools to address the stressors effectively" (McCullough, 1991, p. 738).

Finally, Wollersheim and Wilson (1991) conducted a study using Wollersheim's Coping Therapy (Wollersheim, 1980; 1984) as a cognitive-behavioral treatment for depression. They stated that this therapy is similar to that

of Ellis (1962) and Beck (1976), but "focuses more extensively on emotions and uses many different techniques to try to motivate depressed patients to identify and then change behaviors and cognitions that are dysfunctional and maladaptive" (Wollersheim & Wilson, 1991, p. 497). They compared this treatment to that of a supportive group- which was similar in format to the treatment condition- and a bibliotherapeutic treatment, which was similar to the treatment condition in terms of content. Again, coping was not assessed. Outcome measures included the Beck Depression Inventory; Minnesota Multiphasic Personality Inventory-Depression Scale; Self-Rating of Depression Scale; Clinician Rating of Depression Scale; and the Significant Other Rating of Depression Scale.

Considering that the link between stress and depression is mediated by the ways in which individuals cope with stressors (Skinner et al., 2003), that once people become depressed they may become less effective at coping (Parker & Brown, 1982), and how one copes during a depressive episode impacts the duration of the episode (Nolen-Hoeksema, 1991), the relationship between depression and coping is an important one.

# CHAPTER 5

## Coping Patterns, Interactions with Cognitive Errors, and Changes over the course of Cognitive Therapy for Depression

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**Abstract**

Cognitive therapy (CT) aims to help clients recover from depression by teaching them how to restructure their distorted ways of thinking and resolving practical problems in their life (Beck et al., 1979). While many studies have examined the role of cognitive variables in depression, little research has investigated the role of coping patterns in depression, nor changes in coping over the course of CT. Early and late therapy sessions were selected from 45 participants who had previously received CT during an earlier study (Jacobson et al., 1996; 2000). These sessions were transcribed, and independent observers coded the transcripts for cognitive errors using the Cognitive Errors Rating System (Drapeau et al., 2008) and for coping patterns using the Coping Patterns Rating System (Perry et al., 2007). Depression was assessed every session using the Beck Depression Inventory (Beck et al., 1979). Results indicated that coping based on threat appraisals was positively correlated with levels of depression at early therapy, as were use of delegation and opposition coping patterns. Analyses also indicated that total coping patterns did not change from early to late therapy, however, accommodation, self-reliance, and isolation increased, and helplessness decreased. Comparisons between recovered and non-recovered participants were examined, as were differences between high and low distorters. These sub-group comparisons provided additional information about the relationships between coping and cognitive errors over the course of cognitive therapy for depression. Research and clinical implications were discussed.

# Coping Patterns, Interactions with Cognitive Errors, and Changes over the course of Cognitive Therapy for Depression

## Introduction

Major Depressive Disorder is a common mental affliction, affecting as many as 16.2% of adults (Kessler et al., 2003). Symptoms may include feeling depressed or uninterested in life, feelings of guilt or worthlessness, loss of energy, difficulty concentrating, and thoughts about death or suicide (American Psychiatric Association, 2000). Depression is associated with a reduced ability to carry out daily tasks (Scott & Sensky, 2003), as well as impairments in social functioning (Hirschfeld et al., 2000), and ability to perform at work (Goldberg & Steury, 2001).

The etiology of depression is multifaceted, with empirical evidence suggesting that one's genetic make-up, as well as the occurrence of stressful life events may be contributing factors (Kendler, Karkowski, & Prescott, 1999). According to the stress-diathesis model of depression, negative experiences during early life may create cognitive vulnerabilities in the form of dysfunctional schemas or deeply held maladaptive beliefs. Later life stressful events may reactivate these latent vulnerabilities, resulting in distorted ways of information processing called cognitive errors, the combination of which may progress into an episode of depression (Sacco & Beck, 1995). Concurrently, researchers have suggested that how individuals respond to stress by way coping patterns, may aid or worsen the impact of stressful events (Skinner, Edge, Altman, & Sherwood, 2003).

Restructuring cognitive vulnerabilities and developing appropriate coping patterns are central to cognitive behavioural therapy (Oei & Free, 1995), which is the most commonly used psychological treatment for depression in Western countries (Parker, Roy, & Eyers, 2003). As support for the efficacy of CT has been well documented (Dobson, 1989; Ekers, Richards, & Gilbody, 2008), the focus in research has shifted towards the mechanisms through which CBT achieves its results (Kazdin, 2007). Successful treatment should not only alleviate present symptoms but also alter the underlying factors theoretically linked to the creation and maintenance of depressive episodes.

Research investigating the active ingredients in CBT has focused predominantly on the role of cognitive variables in the etiology and maintenance of depression, to the detriment of understanding the relationship between coping and depression, and changes in coping patterns from early to late therapy. Given that coping has been shown to mediate the relationship between stress and depression (Skinner et al., 2003), that during a depressive episode people may become less adept at coping effectively (Parker & Brown, 1982), and that how a person copes during an episode of depressive may influence the duration of the episode (Nolen-Hoeksema, 1991), additional research in the area of coping in depression is urgently needed.

Coping has been defined as “efforts, both cognitive and behavioral, to manage environmental and internal demands and conflicts affecting an individual that tax or exceed that person's resources” (Coyne, Aldwin, & Lazarus, 1981, p. 440). According to the most commonly used model of stress and coping, there is

an ongoing relationship between environmental stimuli, cognitive appraisals, and coping patterns (Lazarus & Folkman, 1984). Environmental stimuli are initially perceived as irrelevant, benign-positive, or stressful. Stressful events encompass past losses, threats, or challenges. Primary appraisals influence whether or not a stressor will be perceived as a threat or a challenge. Secondary appraisals are the perception of coping resources at one's disposal. Stress occurs when environmental demands (i.e., primary appraisals) are higher than the perceived ability to cope with them (i.e., secondary appraisals). Given the model's emphasis on how individuals appraise events, as opposed to an event's objective qualities, Lazarus and Folkman's model is considered to be a cognitive model of stress and coping (Gunthert, Cohen, Butler, & Beck, 2005).

In the presence of threatening information, a chain of negative emotions, cognitions, behaviours, and physiological reactions may become initiated. This chain creates a downwards spiral of attention focused on the threat, preparing an individual for a fight or flight response. Unlike negativity which constricts one's focus of attention, positivity creates an upwards spiral of thoughts, emotions, behaviours, and physiological reactions that expands and builds upon a person's available range of coping responses (Fredrickson, 2003; Garland et al., 2010). As depression is associated with pervasive negative and distorted thinking (Beck, Rush, Shaw, & Emery, 1979) this may be equivalent to a significant proportion of time spent in the downward spiral. If so, threat appraisals may be produced more automatically than challenge appraisals, perhaps leading to greater use of threat based coping patterns (Joormann & Siemer, 2011).

Using hierarchical factor analyses and rational sorting, Skinner and colleagues (2003) examined over 400 ways of coping from 100 assessments of coping, and produced 12 parsimonious categories under which all existing types of coping may be classified. Of these 12, six are considered to derive from threat appraisals: Helplessness, escape, delegation, isolation, submission, and opposition, and six from challenge appraisals: Problem-solving, information-seeking, self-reliance, support-seeking, accommodation, and negotiation. These twelve coping patterns have been operationalized into a manual entitled the Coping Patterns Rating System (Perry, Drapeau, & Dunkley, 2007; see Table 1).

[Insert Table 1 about here]

Relatively few studies have investigated the relationships between these coping strategies and depression, with a few exceptions. While theoretical models of depression highlight helplessness as a key feature of depression (Abramson, Seligman, & Teasdale, 1978; Beck et al., 1979; Seligman, 1972), Folkman and Lazarus (1986) found that people with high levels of depressive symptoms were just as likely as those with low levels of symptoms to believe that they could change a stressful situation. However, this result could be interpreted as the presence of self-blame, which may be considered a form of submission rather than helplessness (Perry et al., 2007; Skinner et al., 2003). Ozment and Lester (2001) differentiated between helplessness and blame. In a sample of undergraduates, helplessness rather than blame (i.e., *who* caused the helplessness) was more strongly related to higher levels of depression. Another study found that rumination, which is a specific form of helplessness (Perry et al., 2007; Skinner et

al., 2003), was associated with higher levels of depression (Garnefski et al., 2002). Similarly, Hong (2007) found rumination to be correlated with depressive symptoms but not with anxiety symptoms, which is significant due to the high rates of comorbidity between depressive and anxious symptoms.

Depressed individuals have also been found to use more wishful thinking and avoidance coping than nondepressed controls (Coyne et al., 1981), which may be categorized as a form of escape coping (Perry et al., 2007; Skinner et al., 2003). Similarly, greater use of escape-avoidance coping was found among participants who scored high on a measure of depression than those who scored low (Folkman & Lazarus, 1986). Corroborating with these findings is another study that found participants with depression and participants with seasonal affective disorder to use more avoidance coping than controls during a stressful laboratory experiment; the completion of an unsolvable anagram task (Sigmon et al., 2006). These increased levels of avoidance coping seen in depressed participants appears to persist even after depression has remitted, as participants who had recovered from an episode of depression were found to score significantly higher on avoidance coping and wishful thinking than participants who had never had an episode of depression (Ingram, Trenary, Odom, Berry, & Nelson, 2007).

A tendency to use delegation coping strategies may be elevated in people with depression, given findings that when participants were depressed, they viewed themselves to be less effective at using coping strategies (e.g., distraction, socialization, and problem-solving) than they did when they were not depressed

(Parker & Brown, 1982). As for isolation, Parker and Brown (1982) found that people with depression engaged less frequently in socializing when depressed than when not depressed, and also less than controls. Submission, which may manifest as self-blame (Perry et al., 2007; Skinner et al., 2003) has been observed in the speech of depressed patients (Beck, 1963). Self-blame has also been found to be positively correlated with higher levels of depression (Garnefski et al., 2002). Additionally, and Ingram and colleagues (2007) found that previously depressed participants scored significantly higher on self-blame than did participants who had never been depressed. These findings were not replicated by Coyne and colleagues (1981), who found that depressed participants did not differ from control participants in their use of self-blame. Finally, in terms of opposition, depressed participants have been found to use more confrontational coping than non-depressed (Folkman & Lazarus, 1986), and previously depressed participants have been found to score significantly higher on blaming others than have never-depressed participants (Ingram et al., 2007).

Other studies have examined challenge based coping. One study found that depressed participants used fewer problem-solving strategies than did nondepressed participants (Billings & Moos, 1984). However, other studies found that use of problem-solving among depressed participants did not differ from controls (Coyne et al., 1981), and that there was no difference in self-reported use of problem-solving among participants who had been categorized as either high or low on depressive symptoms (Folkman & Lazarus, 1986). In terms of information-seeking, depressed participants reported needing more information

than controls before feeling ready to act on a stressor (Coyne et al., 1981), but this finding was not replicated in a sample of participants with low and high depression levels (Folkman & Lazarus, 1986). Evidence for increased levels of self-reliance has been observed among participants with higher levels of depressive symptoms, including greater use of self-control and accepting responsibility (Folkman & Lazarus, 1986). However, it may be that some of the items purportedly measuring acceptance of responsibility more closely reflected self-blame. As for relying on others, depressed participants have been found to engage in more support seeking than controls (Coyne et al., 1981; Folkman & Lazarus, 1986). No difference was found between depressed and non-depressed adults in their uses of minimization of threat (Coyne et al., 1981), or between participants with high and low levels of depressive symptoms on distancing, perceived need for acceptance of their situation, nor use of positive reappraisal (Folkman & Lazarus, 1986). However, another study found that depressed participants used less distraction when depressed than when no longer depressed, and also used less distraction than non-depressed controls (Parker & Brown, 1982), and that depressed adults rated their situation as less likely to be requiring of acceptance than controls, despite no significant group differences on types of stressful events experienced (Coyne et al., 1981). Similarly, less use of positive reappraisal as a coping strategy was found to be associated with higher levels of depressive symptoms in a sample of adults (Garnefski, Legerstee, Kraaij, Kommer, & Teerds, 2002), as was less use of negotiation (Um & Dancy, 1999).

In sum, these findings point to a mixed picture for the role of challenge based coping patterns in depression, with only a possible link between greater usages of support seeking in depression. Previous findings suggest that a stronger link may lie between the use of threat based coping and depression, possibly with elevated levels of helplessness, escape, isolation, submission, and opposition, with insufficient evidence for the role of delegation. Considering the relationships between coping and depression, the impact of cognitive therapy on these variables may be of interest.

**How do cognitive behavioral therapies relate to change in coping?**

Relatively few studies have assessed changes in coping in CBT. However, in one such study, participants were randomly assigned to receive a problem-solving CBT for depression, an abbreviated version of the problem-solving CBT for depression, or a wait-list control condition. Results indicated that participants who had received the full problem-solving CBT were found to have lower depression scores than the two other groups at post-test and 6-month follow-up. Additionally, both active treatments were found to increase their use of problem-solving on the approach-avoidance scale of Problem-Solving Inventory (PSI; Heppner & Petersen, 1982), however participants who had received the full treatment reported higher levels of confidence in their problem-solving abilities (Nezu & Perri, 1989).

In Jordan, a sample of moderately to severely depressed university students, were randomly assigned to a control group or the CBT treatment program called the Modified Teaching Kids to Cope. At termination, the

intervention group was found to have significantly decreased their use of avoidance coping strategies, increased their use of approach coping strategies (i.e., planful problem-solving, support seeking, and positive reappraisal) on the Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1988), and significantly reduced both their perceived stress on the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), and depression scores on an Arabic version of the Beck Depression Inventory (BDI; Hamdi, Nizam, & Saber, 1988). However, the control group was also found to lower their use of avoidance coping strategies, such that posttest scores did not differ for the two groups on level of avoidance coping (Hamdan-Mansour, Puskar, & Bandak, 2009).

In a Hong Kong study (Wong, 2008), participants were randomized to control or experimental conditions (10 group sessions of CBT), in addition to all participants receiving pharmacotherapy. Compared to the "control" group, at post-treatment the CBT group had lower depression scores, fewer negative emotions on the The Emotions Checklist (Cormier & Hackney, 1987), more adaptive coping skills on The COPE scale (Carver, Scheier, & Weintraub, 1989; which was modified by Lam, 2003), and fewer dysfunctional attitudes on the Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978). However, only change in dysfunctional attitudes significantly predicted change in depressive symptoms, leading Wong (2008) to conclude "this study did not provide support for the linkage between the acquisition of adaptive coping skills and the reduction in depressive symptoms" (Wong, 2008, p. 147). This was attributed to the fact that

perhaps not enough time was spent on coping skills (approximately 2 out of 10 sessions).

In another study, patients were assigned to receive either CBT or process-experiential therapy for depression. After therapy, both groups had significantly decreased their suppressive and reactive styles of coping, and increased their reflective coping on the Problem-Focused Style of Coping (PF-SOC; Heppner, Cook, Wright, & Johnson, 1995). There was also no significant group x time interaction for coping (Watson, Gordon, Stermac, Kalogerakos, & Steckley, 2003). Finally, a study by Wilkinson and Goodyer (2008) examined a sample of 26 adolescents with depression who were randomly assigned to receive either serotonin-specific reuptake inhibitor antidepressants (SSRIs) plus psychosocial treatment as usual or SSRIs plus psychosocial treatment and CBT. After 30 weeks of treatment, the two groups did not differ on their levels of depression, but the CBT group had significantly lower levels of rumination, which Wilkinson and Goodyer (2008) concluded could potentially reduce the risk of relapse for the CBT group. Collectively, these studies suggest that cognitive behavioral therapies are associated with changes in coping, and that increases in challenge based coping patterns (e.g., problem-solving, support-seeking, and accommodation) are related to decreases in depression. These findings may be partially due to CBT's emphasis on solving practical problems, and also to its emphasis on cognitive restructuring, given that coping patterns rely on cognitive appraisals.

**Interactions between cognitive variables and coping patterns**

In a recent review of the component analysis studies of CBT for anxiety and depressive disorders, Longmore and Worrell (2007) concluded that cognitive interventions were not an essential ingredient in CBT, providing little beyond what is provided by the behavioral interventions. They attributed this to the notion that "psychological states comprise interacting cognitive, affective, behavioral and physiological elements. Any treatment which effectively targets one of these systems may lead to a change in all of them (Borkovec et al., 2002)" (Longmore & Worrell, 2007, p. 184). Further, Longmore and Worrell added that "it is possible that component studies are flawed because in seeking to dismantle the separate parts of CBT, they neutralize what makes it effective: The interaction of cognitive and behavioral techniques." (2007, p. 184).

Only one study was found that examined interactions between cognitive errors (as assessed by the Cognitive Distortion Questionnaire (no reference provided) and coping patterns using the Self-Help Inventory (no reference provided). This study by Burns, Shaw, and Croker (1987) found that women who distorted more severely and who were less willing to cope had the highest symptoms of depression. They concluded that distortions and coping made additive independent contributions to the prediction of depression severity.

**Limitations of existing coping studies**

There are several major limitations about the state of research into coping patterns in depression and CBT for depression. The first is that simply not enough studies have been conducted. Little is known about the coping patterns employed

by depressed individuals, and even less in known about how coping patterns change over the course of CBT for depression.

Previous research has relied almost exclusively on the assessment of coping patterns using self-report measures (Parker & Endler, 1992), which have been criticized on a number of grounds, including: (1) Issues with reliability and validity (Parker & Endler, 1992), (2) a reliance on defining coping as either problem-focused or emotion-focused (Coyne et al., 1981) despite findings that in 1,332 stressful episodes 98% of coping patterns elicited both problem-focused and emotion-focused coping patterns (Folkman & Lazarus, 1980), (3) scale items include functionally heterogeneous categories that have little to do with one another such as "tried to see the positive side of the situation" as well as "tried to reduce tension by taking more tranquilizing drugs" (see emotion-focused coping assessed by Billings and Moos, 1984), (4) the presence of value-laden items, such as the COPE scale by Carver and colleagues (1989), who define three coping subscales as being "arguably less useful", and (5) self-report instruments assessing how people typically coped or would hypothetically cope with stressors. This methodology has been found to be a poor predictor of how people actually cope with stressors because it assumes that the way people cope with one type of stressor is consistent with how they will cope with a completely different stressor (Folkman & Lazarus, 1980).

Another complicating factor is that over 400 different labels have been used to define coping patterns, requiring an "item-by-item analysis of subscales to decide whether findings are comparable. This makes it practically impossible to

aggregate findings relevant to the same stressor and domain, much less compare results across different stressors or domains" (Skinner et al., 2003, p. 216-217).

**The current study**

After their review of the literature, Skinner and colleagues (2003) condensed over 400 coping labels into 12 parsimonious coping patterns. The current study assessed coping patterns with a new methodology, the first known observer-rated method of coping patterns: The Coping Patterns Rating System (Perry et al., 2007). This measure allows for an in-session process-level analysis of coping patterns as they actually occur, circumventing the problems associated with traditional self-report questionnaires, and allowing for a complete assessment of all possible coping patterns in one study.

The goals of this research were to describe a coping profile for a sample of depressed participants at therapy intake in terms of the frequency and type of coping patterns used, to expand on what is already known about the relationships between coping, cognitive errors, and depression, and to examine how coping patterns change from early to late therapy. The following hypotheses were tested: (1) At early therapy, depressed participants would display elevated levels of helplessness, escape, isolation, submission, opposition, and support-seeking, and lower levels of negotiation, (2) depression would be positively correlated with threat based coping patterns, (3) threat based coping patterns would decrease from early to late therapy, (4) challenge based coping patterns would increase from early to late therapy, (5) recovered participants would endorse fewer threat based coping and more challenge based coping at the end of therapy than would non-

recovered participants, and (6) greater decreases in depression would be positively related to greater decreases in threat based coping patterns and greater increases in challenge based coping patterns. Also investigated were whether or not cognitive errors (CEs) and coping patterns would be related to one another at early therapy, and at late therapy, and if high and low distorters (determined by early therapy total CEs) would differ from one another on coping patterns at early and late therapy.

## Method

### Participants

The data set comprised 45 participants who were selected from the cognitive therapy (CT) arm of an earlier component analysis study of CT for depression (see Jacobson et al., 1996; 2000). The mean age of the participants was 39.24 years (*SD* =9.06), and the majority of participants were female (78%). The nationalities of participants were Caucasian (75.6%; 35 participants), African American (4.4%; 2 participants), Asian (4.4%; 2 participants), and Native American (6.7%; 3 participants), and four participants did not report their ethnicity. All participants met criteria for depression according to the *Diagnostic and Statistical Manual of Mental Disorders* (3rd edition, revised; *DSM—III—R*; American Psychiatric Association, 1987, which is consistent with the *DSM-IV*), scored greater than 13 on the 17-item Hamilton Rating Scale for Depression (HRSD; Hamilton, 1967), and greater than 19 on the Beck Depression Inventory (BDI; Beck et al., 1979).

### Therapists

Manualized CT was provided according to the treatment manual written by Beck and colleagues (1979). Adherence to the manual was assessed by having an expert (K. Dobson), randomly listen to 20% of the audio-taped therapy sessions, and notifying therapists if they had deviated from the protocol. Independent raters also monitored the audio-tapes for fidelity, and the therapists attended monthly meetings to discuss treatment issues with CT experts. Four therapists, their mean age being 43.5 years (range = 37 – 49 years), participated in the study. All therapists had previous experience delivering CBT in one or more clinical trials, had an average of 14.8 years of postdegree clinical experience (range = 7 - 20 years), and had an average of 9.5 years practicing CT since their formal training (range = 8 - 12 years).

**Therapy**

Twenty sessions of cognitive therapy were offered to the participants with a focus on helping them to identify and challenge their distorted ways of thinking, and to increase their use of adaptive coping skills.

**Measures**

*Beck Depression Inventory* (BDI; Beck et al., 1979) is a frequently used self-report questionnaire that has excellent psychometric properties, and includes 21 items that assess levels of depressive symptoms (Beck, Steer, & Garbin, 1988).

*Hamilton Rating Scale for Depression* (HRSD; Hamilton, 1967) is a clinical interview comprising 17 items that is widely used to assess the severity of depressive symptoms because of its excellent psychometric properties (Clark & Watson, 1991).

*The Cognitive Errors Rating System* (CERS; Drapeau, Perry, & Dunkley, 2008). The CERS is a new observer-rated method that allows for the assessment of 15 CEs based on the original work by Beck (1976), J. Beck (1995), Burns (1999), and DeRubeis, Tang, and Beck (2001): (1) Fortune telling, (2) labeling, (3) overgeneralizing, (4) all-or-nothing thinking, (5) discounting the positive or negative, (6) emotional reasoning, (7) magnification and/or minimization of the negative or positive, (8) mental filter, (9) should and must statements, (10) tunnel vision, (11) jumping to conclusions, (12) mind-reading, (13) personalization, (14) inappropriate blaming/crediting of self, while ignoring the roles of others, and (15) inappropriate blaming/crediting of other, while ignoring the role of self. All 15 CEs may present as positive or negative in valence, resulting in a total of 30 CEs. As a study by Lefebvre (1981) indicated that CEs may be grouped into four higher order categories, the CERS has followed these same guidelines: Fortune telling (Cluster A: CE 1), overgeneralization (Cluster B: CEs 2 and 3), selective abstraction (Cluster C: CEs 4 – 11), and personalizing (Cluster D: CEs 12-15). Similar to the 15 CEs, these four clusters may appear as positive or negative in valence, resulting in a total of 8 CE clusters.

For the current study, one doctoral level student was trained by the developers of the CERS, and she trained another doctoral student on the method. These two doctoral students then trained the two other raters (one MA student and one PhD student). To evaluate the degree of agreement between the raters, 18% of cases were rated in consensus, and inter-rater reliability was found to be good: for 30 individual CEs ICC (2,1) = .81, for 15 CEs ICC (2,1) = .78, for 8 clusters ICC

(2,1) = .88, for 4 clusters ICC (2,1) = .84, for positive vs. negative CEs ICC (2,1) = .92, and for total CEs ICC (2,1) = .86. Internal and external validity has been previously obtained (see D'Iuso, Blake, & Drapeau, 2007; Drapeau & Perry, 2005; Drapeau, Perry, Blake, & D'Iuso, 2007; Perry, Drapeau, Dunkley, Foley, Blake, & Banon, 2007).

The CERS allows for the assessment of type and quantity of cognitive errors as they naturally appear. Although previous studies have used mood priming procedures to enable the assessment of latent cognitive variables such as dysfunctional attitudes and schemas (Segal & Ingram, 1994), cognitive errors may be present at all levels of cognition, including the more accessible automatic thoughts (Beck, 1995), suggesting that a prime may not be needed for them to appear. In fact, the CERS has effectively been used to capture CEs in a recent study of bipolar patients (Kramer, Bodenmann, & Drapeau, 2009).

*Coping Patterns Rating System* (CPRS; Perry, Drapeau, & Dunkley, 2007). The CPRS is the first known observer-rated measure of coping patterns (CPs). A detailed manual outlines the procedures for rating each of the 12 coping patterns, so that coping patterns can be coded in the verbal material generated by clients. The manual contains definitions, aims, and examples for each type of coping pattern, as well as examples for how the coping patterns can be expressed at the affective, behavioral, and cognitive level. Ways of distinguishing similar coping patterns from one another are also included. For the current study, one doctoral level student was trained by the developers of the CPRS, and she trained another rater (a PhD student). These two initial raters then trained the other three

raters (2 MA level students and 1 PhD student), 18% of cases were rated in consensus, and inter-rater reliability was good: for the 36 CPs ICC (2,1) = .76, for 12 CPs ICC (2,1) = .82, for threat vs. challenge ICC (2,1) = .91, for total CPs ICC (2,1) = .80. For previously obtained internal and external validity data, see D'Iuso and colleagues (2007), Drapeau and Perry (2005), Drapeau and colleagues (2007), and Perry and colleagues (2007).

**Procedure**

Participants were offered 20 sessions of cognitive therapy, all of which were audio-taped. From this selection, sessions three and 19 were chosen as measures of early and late therapy. If participants had attended less than 20 sessions, the penultimate therapy session was selected in lieu of session 19. Session three was chosen based on research indicating that the first couple of therapy sessions typically include intake tasks such as explaining the treatment model, the setting the parameters of therapy, conducting an intake assessment, and developing the therapeutic alliance (Beck et al., 1979; Horvath & Luborsky, 1993). As research has also shown that cognitive restructuring exercises do not formally begin until at least session four (Ilardi & Craighead, 1994), session three seemed like the optimal time to obtain an early assessment of cognitive errors. Similarly, the penultimate therapy session was chosen to represent late therapy CEs in order to obtain the latest possible account of CEs that would not be obscured by end-of-therapy termination tasks.

These early and late therapy sessions were transcribed, and any identifying information such as names and session numbers was removed. Session numbers

were replaced by a randomly assigned code so that raters would not know if they were rating an early or late therapy transcript. Verbatim transcripts were coded by trained independent raters using the Cognitive Errors Rating System (Drapeau, et al., 2008) and the Coping Patterns Rating System (Perry, et al, 2007).

## Results

### Preliminary analyses

The normality of the variables was assessed using the Shapiro-Wilk test, as the sample contained less than 50 participants. Results indicated that most coping patterns and cognitive errors were non-normally distributed; therefore non-parametric tests were used for all analyses. Early therapy cognitive errors and coping patterns were assessed for 44 participants at session three and for one participant at session two due to availability. Late therapy assessments of cognitive errors and coping patterns took place between sessions eight and 19, with the average session being 17.98. Depression had been assessed pre- and post-therapy using the BDI and HRSD and every session using the BDI in the original study (Jacobson, et al., 1996). Therefore, early and late depression scores were based on the BDI session that corresponded to the session that the cognitive errors and coping patterns had been rated from. In three instances where these BDI scores were missing, data were estimated using the closest available scores.

### A profile of early therapy coping patterns in Depression

During an average 50-minute early session of cognitive therapy, participants spoke 3365.31 words (*SD* = 1488.08), and reported using an average of 5.89 coping patterns per 1000 words (*SD* = 2.03), totaling an average of 18.64

coping patterns per early session (*SD* = 8.92). The frequency of challenge based coping, threat based coping, and each of the 12 coping patterns that comprise these higher-order categories can be seen in Table 2. These sessions also contained an average of 3.50 cognitive errors (CEs) per 1000 words (*SD* = 2.23), totaling 10.91 CEs per session (*SD* = 6.46). Most CEs (94%) were negative in valence, see Blake, Dobson, and Drapeau (2011) for further details.

[Insert Table 2 about here]

A Wilcoxon signed ranks test indicated that the use of challenge based coping (*Mdn* = 3.79, range = 1.28 – 7.99; *Z* = - 4.79, *p* <.001) was greater than the use of threat based coping (*Mdn* = 1.76, range = .27 – 5.96). In terms of prevalence rates for specific coping patterns, information-seeking accounted for 18.98% of total coping patterns (*SD* = .12), followed by problem-solving (17.04%, *SD* = .13), helplessness (16.87%, *SD* = .13), self-reliance (13.05%, *SD* = .10), accommodation (9.75%, *SD* = .08), support-seeking (6.46%, *SD* = .08), escape (4.10%, *SD* = .06), opposition (4.01%, *SD* = .06), isolation (3.61%, *SD* = .05), submission (3.22%, *SD* = .05), delegation (1.74%, *SD* = .04), and negotiation (1.17%, *SD* = .02).

**Relationship between coping patterns and Depression at early therapy**

Spearman correlations were computed between coping patterns and BDI depression scores from corresponding early therapy session. One-tailed Spearman correlations indicated that threat based coping was significantly correlated with depression (*r* = .25, *p* = .04), and an inverse, but non-significant relationship was found for challenge based cognitive coping (*r* = -.14, *p* = .19).

Of the 12 coping patterns, one-tailed Spearman correlations were computed to assess the relationship between depression and helplessness, escape, support seeking, negotiation, isolation, submission, and opposition, and two-tailed correlations were used for the other five coping patterns where no hypothesis could be generated (delegation, problem-solving, information-seeking, self-reliance, and accommodation). Spearman correlations indicated that only delegation ($r = .31$, $p = .04$) and opposition ($r = .27$, $p = .04$) were significantly correlated with early depressive symptoms on the BDI.

**Distortion status and coping patterns at early therapy**

High or low distortion status was determined for each participant according to a median split of early therapy total cognitive errors (see Blake, Dobson, & Drapeau, 2001; Dozois, Covin, & Brinker, 2003). A two-tailed Mann-Whitney test conducted for a previous study (Blake et al., 2011) confirmed that participants classified as high distorters reported more total cognitive errors (*Mdn* = 4.74, range = 2.75 - 10.26), than those classified as low distorters (*Mdn* = 1.94, range = .00 - 2.57; $U = .00$; $p < .001$). Negative cognitive errors primarily accounted for this difference (high distorters: *Mdn* = 4.33, range = 2.59 - 10.26; low distorters: *Mdn* = 1.70, range = .00 - 2.40; $U = .00$; $p < .001$), as positive CEs did not significantly differ between the two groups (high distorters: *Mdn* = .00, range = .00 - 1.15; low distorters: *Mdn* = .17, range = .00 - .86; $U = 233.00$; $p = .62$).

A Mann-Whitney test indicated that high and low distorters did not differ from one another in their use of any of the 12 coping patterns at early therapy.

However, the high distorters used significantly more threat based coping patterns (*Mdn* = 2.25, range = .57 – 4.85) than did low distorters (*Mdn* = 1.26, range = .27 – 5.96; *U* = 160.00, *p* = .04), and there were no differences for challenge based coping.

**Correlations between cognitive errors and coping patterns at early therapy**

Correlations were computed between 30 early therapy CEs, early threat based coping, and early challenge based coping. Using Spearman two-tailed correlations, the only CEs that significantly correlated with threat based coping were all-or-nothing negative (*r* = .30, *p* = .04*),* and jumping to conclusions negative (*r* = .33, *p* = .03). No CEs were correlated with challenge based coping.

Total positive CEs and total negative CEs were then correlated with the 12 coping patterns, and no significant relationships were found. When the total positive and total negative CEs were correlated with threat based and challenge based coping patterns, again no significant correlations were found.

**Change in coping patterns from early to late therapy for all participants**

As participants spoke more words during late therapy (*M* = 3809.78 words, *SD* = 1588.35), than during early therapy (*M* = 3365.31 words, *SD* = 1488.08), *t*(44) = -2.31, *p* = .03, all comparisons were calculated per 1000 words.

A Wilcoxon signed ranks test indicated that the total number of coping patterns endorsed by participants during early therapy did not significantly differ from the total number of coping patterns endorsed during late therapy. Similarly, the number of challenge based coping patterns was not found to significantly change from early to late therapy. However, two types of challenge based coping

patterns did change; self-reliance significantly increased as did use of accommodation. Additionally, use of threat based coping was found to significantly decrease from early to late therapy, as did the specific threat based coping pattern of helplessness. However, the isolation coping pattern increased (see Table 3).

[Insert Table 3 about here]

**Recovered *vs.* non-recovered participants on late therapy coping patterns**

In keeping with the guidelines set forth by Jacobson and colleagues (1996), participants were considered to have recovered from their episode of depression if at post-test they no longer met criteria for depression using the DSM-III-R, scored less than nine on the BDI, and less than eight on the HRSD. Accordingly, 53% participants were classified as recovered ($n$ = 24), 44% as non-recovered ($n$ = 20), and one participant was not classified due to missing data

Mann-Whitney tests indicated that at both early and late therapy, recovered and non-recovered participants did not differ from one another in their total number of coping patterns, nor their use of challenge based coping. Total number of threat based coping also did not differ between the two groups at early therapy, however of the six specific threat based coping patterns, escape coping was higher at early therapy for participants who would later recover, and delegation was higher for participants who would later not recover. By late therapy, the only differences between the recovered and non-recovered participants were that use of threat coping was higher for the non-recovered group, as was use of delegation and helplessness (see Table 4).

[Insert Table 4 about here]

**Changes in coping patterns among recovered participants (*n* = 24).** Among recovered participants, a Wilcoxon signed ranks test indicated that the total number of coping patterns did not significantly change from early to late therapy, nor did the frequency of challenge based coping patterns. However, when the six types of challenge based coping patterns were examined individually, it was found that accommodation significantly increased from early (*Mdn* = .54, range = .00 – 1.51) to late therapy (*Mdn* = .98, range = .00 – 3.16; *Z* = -2.25, *p* = .02); no other challenge based coping patterns significantly changed.

It was also found that the use of threat coping significantly decreased from early (*Mdn* = 1.74, range = .27 – 3.60) to late therapy (*Mdn* = .62, range = .00 – 3.59; *Z* = -2.29, *p* = .02), in particular, helplessness decreased from early therapy (*Mdn* = 1.08, range = .00 – 2.29) to late therapy (*Mdn* = .00, range = .00 – 1.51; *Z* = -2.86, *p* = .004), as did escape (early: *Mdn* = .28, range = .00 – 1.80; late: *Mdn* = .00, range = .00 - .72; *Z* = -2.20, *p* = .03). No other significant changes in threat based coping were observed.

**Changes in coping patterns among non-recovered participants (*n* = 20).** A Wilcoxon signed ranks test indicated that non-recovered participants did not show increases or decreases in their use of either challenge based or threat based coping patterns from early to late therapy. Of the 12 coping patterns, only isolation (a threat based coping pattern) was found to significantly decrease from early (*Mdn* = .00, range = .00 - .70) to late therapy (*Mdn* = .00, range = .00 - .45; *Z* = -2.05, *p* = .04).

**Comparisons between high and low distorters on late therapy coping patterns**

A Mann-Whitney test indicated that high and low distorters (defined by intake total CEs) did not differ from one another in their total amount of coping patterns at late therapy ($U = 217$, $p = .41$). There were also no differences between their usage of threat based coping ($U = 228.00$, $p = .57$), nor challenge based coping patterns ($U = 231.00$, $p = .62$), nor differences on any of the 12 late therapy coping patterns

**Changes in coping patterns among low distorters, ($n = 22$).** Among the low distorters, Wilcoxon signed ranks tests indicated that there were no changes in the total number of coping patterns ($Z = -.02$, $p = .99$); no changes in use of threat coping ($Z = -1.22$, $p = .22$), challenge coping ($Z = -.47$, $p = .64$), or on any of the 12 coping patterns: Problem-solving ($Z = -.37$, $p = .71$), information-seeking ($Z = -1.22$, $p = .22$), helplessness ($Z = -1.23$, $p = .22$), escape ($Z = -1.29$, $p = .20$), self-reliance ($Z = -1.69$, $p = .09$), support seeking ($Z = -.20$, $p = .85$), delegation ($Z = -.11$, $p = .92$), isolation ($Z = -1.50$, $p = .13$), accommodation ($Z = -1.77$, $p = .08$), negotiation ($Z = -1.52$, $p = .13$), submission ($Z = -.85$, $p = .40$), opposition ($Z = -.36$, $p = .72$).

**Changes in coping patterns among high distorters (n =23).** Similar to low distorters, high distorters also showed no significant changes from early to late therapy on total coping ($Z = -.21$, $p = .83$), threat coping ($Z = -1.76$, $p = .08$), or challenge coping ($Z = -.73$, $p = .47$), nor any of the 12 coping patterns: Problem-solving ($Z = -.11$, $p = .91$), information-seeking ($Z = -.34$, $p = .74$),

helplessness ($Z$ = -1.83, $p$ = .07), escape (Z = -.28, p = .78), self-reliance ($Z$ = -1.25, $p$ = .21),support seeking ($Z$ = -1.02, $p$ = .31), delegation ($Z$ = -.36, $p$ = .72), isolation ($Z$ = -1.29, $p$ = .20), accommodation ($Z$ = -1.80, $p$ = .07), negotiation ($Z$ = -.51, $p$ = .61), submission ($Z$ = -.34, $p$ = .73), opposition ($Z$ = -.09, $p$ = .93).

**Correlations between cognitive errors and coping patterns at late therapy**

Among recovered participants, Spearman correlations (two-tailed) were computed between the following late therapy variables: Threat coping, challenge coping, positive CEs, and negative CEs. The only significant correlation was between threat coping and negative CEs ($r$ = .53, $p$ = .008). These same correlations were computed for non-recovered participants. Again it was found that negative CEs were positively correlated with use of threat coping ($r$ =.62, $p$ = .004), however, it was also found that higher levels of positive CEs were associated with using fewer threat based coping patterns ($r$ = -.68, $p$ = .001). When recovered and non-recovered participants were combined, results for the entire group mimicked those of the non-recovered: Negative CEs were positively correlated with use of threat coping ($r$ = .60, $p$ < .001), and higher levels of positive CEs were associated with using fewer threat based coping patterns ($r$ = -.41, $p$ = .005).

**Correlations between change in coping patterns and change in depressive symptoms**

Change variables were assessed by subtracting late therapy assessments from early therapy assessments. Spearman one-tailed correlations between change in depressive symptoms on the BDI and change in coping variables

indicated: Decreases in depression were associated with decreases in total use of coping patterns ($r$ = .29, $p$ = .03), which was not due to changes in challenge coping as there was no relationship between change in depression and change in challenge coping ($r$ = .06, $p$ = .34). However, it was found that as depression decreased, use of threat coping decreased ($r$ = .37, $p$ = .006). In terms of the 12 specific coping patterns, it was observed that as depression decreased, use of escape decreased ($r$ = .44, $p$ = .001), as did use of negotiation ($r$ = .31, $p$ = .02).

Correlations were re-computed separately for recovered and non-recovered participants. Among the recovered participants, no significant correlations were observed between any of the change variables and levels of depressive symptoms. Among the non-recovered, the only significant findings were that decreases in depression were associated with decreases in support-seeking ($r$ = .39, $p$ = .04) and decreases in negotiation ($r$ = .55, $p$ = .006).

## Discussion

The aims of the study were to examine the nature of coping patterns in depression, the relationships between coping, cognitive errors, and depressive symptoms, and changes in coping patterns over the course of cognitive therapy. The main findings have been summarized and discussed, followed by limitations and strengths of the study including its contribution to knowledge, terminating with recommendations for future research and clinical practice.

### Coping patterns and Depression

The current study provided an in-depth analysis of coping strategies as they occurred or were reported by participants during early and late cognitive

therapy sessions for treatment of depression. It was hypothesized based on previous research findings that depressed participants would display elevated levels of helplessness (Abramson, Seligman, & Teasdale, 1978; Beck et al., 1979; Garnefski et al., 2002, Hong, 2007; Ozment & Lester, 2001; Seligman, 1972), escape (Folkman & Lazarus, 1986; Ingram et al., 2007; Sigmon et al., 2006), isolation (Parker & Brown, 1982), submission (Beck, 1963; Garnefski et al., 2002; Ingram et al., 2007), opposition (Folkman & Lazarus, 1986; Ingram et al., 2007), and support-seeking (Coyne et al., 1981; Folkman & Lazarus, 1986), and lower levels of negotiation (Um & Dancy, 1999).

Findings indicated that the order of prevalence for use of coping patterns was: Information-seeking, problem-solving, helplessness, self-reliance, accommodation, support-seeking, escape, opposition, isolation, submission, delegation, and negotiation. Contrary to predictions, the most frequently identified coping pattern was information-seeking, followed by problem-solving. In fact, most of the challenge based coping patterns were more prevalent than the threat patterns. An exception to this was that helplessness was the third most commonly used coping pattern, which was in agreement with predictions based on previous research that helplessness would be elevated. Also in line with predictions was the finding that negotiation was the least frequently used coping pattern.

Considering that problem-solving has been developed as a stand-alone treatment to target the problem-solving deficits in depression (Chang, D'Zurilla & Sanna, 2004; D'Zurilla & Nezu, 2006), it was contrary to hypotheses that problem-solving was the second most common type of coping pattern employed

by the participants. One possible explanation for this high preponderance of problem-solving in the current study may be due to the very nature of problem-solving- as an overarching category under which may other specific types of coping may fall. For example, Dobson and Dobson (2009) have written that ``in a sense, all of cognitive-behavioural therapy is solving problems" (p. 82), and they cite several examples of problem-solving such as conflict resolution skills, obtaining social support, and cognitive restructuring. Therefore, it may be that when participants described how they had coped, it appeared to be a form of problem-solving, when more specific underlying coping patterns may have been utilized though not clearly articulated by the participants.

Another explanation for the elevated levels of problem-solving in the current study may be that the Coping Patterns Rating System (Perry et al., 2007) captures elements of problem-solving such as planning; however according to D'Zurilla and Nezu (1982) problem-solving is a complex process involving many stages: (1) Recognizing that a problem is present, (2) being able to define the problem in a concrete and specific way, (3) generating a list of all possible courses of action, (4) weighing the pros and cons of each proposed solution based on potential consequences and then choosing the optimal course of action, (5) implementing the solution and elevating the outcome. Therefore, participants likely used many elements of problem-solving, but not the complete process.

Further, (Nezu, 1987) has described how cognitive errors that are present in depression may hinder the quality of the problem-solving process:

> "A person who engages in these distortions of information would likely define a problem in an inaccurate manner which could then lead to ineffective problem resolution...when the source of the problem is not properly identified, it decreases the probability that effective solutions can be generated. If this leads to a preponderance of negative consequences as a function of unresolved problems, then difficulties in one's ability to accurately define a problem may also activate a vulnerability to depression" (p. 132).

Perhaps in line with the phenomenon of elevated thinking distortions and hopelessness in depression, the participants reported their coping patterns in a way that appeared to represent more challenge than threat-based coping patterns, along the lines of "I did everything right and *still* nothing works out for me". For this reason, therapists may wish to gather detailed accounts of exactly *how* the person carried out the coping strategy in question.

**Relationship between coping patterns and Depression at early therapy**

As hypothesized, depression was positively correlated with threat based coping patterns. No hypothesis had been made for the relationship to challenge patterns, but an inverse negative correlation had been observed. It was also hypothesized that depression would be positively correlated with helplessness, escape, support seeking, isolation, submission, and opposition, and negatively correlated with negotiation. No predictions were made for delegation, problem-solving, information-seeking, self-reliance, and accommodation. Consistent with predictions, opposition was positively correlated, but contrary to predictions the

only other significant relationship was a positive correlation between delegation and depressive symptoms.

That the frequencies of opposition and delegation patterns were related to depressive symptoms may be due to the fact that these coping patterns have an interpersonal component. For example, treating others in an oppositional or hostile manner tends to pull for others to respond in a hostile way (McCullough, 2000), which in turn may confirm the depressed person's negative schemas about others (Beck et al., 1979), and exacerbate feelings of depression. The relationship between delegation and level of depressive symptoms may be related to an underlying problem of low self-efficacy, as low self-efficacy has been found to correlate with symptoms of depression (e.g., Van Voorhees, Melkonian, Marko, Humensky, & Fogel, 2010).

**Coping patterns and cognitive errors at early therapy**

No hypotheses were made regarding the nature of the interactions between coping patterns and cognitive errors at early therapy. Results indicated that high and low distorters did not differ from one another on any of the 12 coping patterns; however when the six threat based coping patterns were combined, it was found that threat based coping was reported at a higher frequency for the high distorters than the low distorters. This pattern was not replicated when the six challenge coping patterns were combined; there was no significant difference between the two groups on challenge based coping.

In terms of the correlation analyses, all-or-nothing negative and jumping to conclusions negative were the only cognitive errors that correlated with threat

coping, and no cognitive errors correlated with challenge based coping. Total positive CEs and total negative CEs were not related to any of the coping variables (i.e., threat, challenge, or the 12 coping patterns).

While many studies have examined the link between threat appraisals and anxiety disorders (for reviews see Bar-Haim, Lamy, Pergamin, Bakersman-Kranenburg, & van IJzendoorn, 2007; Cisler & Koster, 2010; Mathews, & MacLeod, 1994) relatively few studies have examined the link between depression and threat appraisals. Perhaps one reason to explain the high comorbidity between anxiety and depression, which is estimated to be about 50-60% (Hirschfeld, 2001; Kaufman & Charney, 2000) may relate to a common propensity towards processing neutral stimuli as threatening. In fact, a model has been devised by Gray and McNaughton (2000) depicting the links between stimuli perceived as threatening and subsequent anxiety or depressive disorders. According to the model, threatening stimuli may be subdivided into actual or potential threats. These threats may then be subdivided into avoidable or unavoidable threats. Example chains include: (1) Threat → actual → avoidable→flee→fear→phobia, and (2) threat →potential →unavoidable →conserve resources → depression. This model illustrates that the link between threats and subsequent emotional disorders stems from additional factors such as actual presence or anticipation of threats, as well as if the threats are avoidable or unavoidable. However, these authors stipulate that one can never be completely sure if a potential threat will become a real threat or if a threat is going to be avoidable or unavoidable, hence several brain regions may become activated at

once, leading to a comorbidity of symptom presentation across emotional disorders.

**Changes in coping patterns from early to late therapy for all participants**

The total number of coping patterns did not change from early to late therapy. However, as hypothesized, threat based coping decreased for the entire group, as did helplessness, which is congruent with theoretical models of depression (Abramson, Seligman, & Teasdale, 1978; Beck et al., 1979; Seligman, 1972). Contrary to predictions, challenge based coping did not increase; however two types of challenge patterns increased: self-reliance and accommodation. The increase in accommodation is congruent with the emphasis in CBT on cognitive restructuring (Beck et al., 1979) because accommodation encompasses items such as acceptance of limitations, and cognitive restructuring (Perry et al., 2007). In terms of self-reliance, perhaps this was increased as a function of implicit Western values, as Western culture tends to emphasize the importance of independence and self-reliance (Gecas, 1989). If self-reliance was emphasized by therapists in subtle, non-explicit ways, it may account for why isolation also increased from early to late therapy. Therapists may wish to engage in a more explicit discussion with clients about how to practice self-reliance while maintaining connections to others may have circumvented this result.

**Recovered vs. non-recovered participants**

It was hypothesized that recovered participants would endorse fewer threat based coping patterns and more challenge based coping patterns at the end of therapy than would non-recovered participants. Results indicated that only the

first hypothesis was supported. It was found that recovered and non-recovered participants did not differ from one another in quantity of coping patterns, nor the number of challenge based coping patterns at either early or late therapy. This tentatively suggests that recovery was not associated with how many stressors one needed to cope with, but rather the type of strategies one used to cope. In particular, it was found that at therapy intake, recovered and non-recovered participants did not differ from one another on their use of threat based coping patterns. However, by late therapy, the recovered group had significantly reduced their use of threat based coping, while the non-recovered group showed no significant change. This resulted in the non-recovered group having higher levels of threat based coping than the recovered group at late therapy. This finding tentatively suggests that a reduction in threat based coping may be necessary for recovery from depression.

Only the recovered group increased their use of accommodation coping patterns from early to late therapy, which may suggest that recovered participants better understood and/or employed the cognitive restructuring strategies taught in CT, and that elements of accommodation such as reframing and cognitive restructuring were necessary for remission of depression; findings which support the use of cognitive restructuring in cognitive therapy. The recovered group also decreased their levels of helplessness and escape, whereas the only significant change among the non-recovered was a decrease in isolation. Between the two groups, delegation was higher for non-recovered participants at early and late therapy, and helplessness was also higher for the non-recovered group at late

therapy. Together these findings suggest that recovery from depression is associated with increased accommodation, as well as decreased helplessness and escape.

Based on the finding by Parker and Brown (1982) that depressed participants view themselves to be less effective at using coping strategies when in a depressive episode than when not depressed, it was hypothesized that this would lead to a greater use of delegation coping patterns in the current study. This hypothesis was supported because at early therapy recovered and non-recovered groups (defined at late therapy) did not differ from one another on levels of delegation, but at late therapy, they did differ, with the non-recovered group exhibiting higher levels. It may be that low perceived self-efficacy contributed to greater use of delegation. In fact, Gecas (1989) has stated that low perceived self-efficacy may be reciprocal in depression: "Feelings of inefficacy can lead to depression, and being depressed can contribute to one's sense of inefficacy" (p. 298).

**Comparisons between high and low distorters on late therapy coping patterns**

High distorters reported higher amounts of threat coping at early therapy than did low distorters, but this difference disappeared by late therapy, suggesting that therapy may have equalized this difference. However, when changes in threat coping, challenge coping, and the 12 coping patterns were examined within each group, no significant changes were found. No literature was found that had examined high and low distorters and coping patterns, making it impossible to

compare results of the present study to past work in this area. These findings suggest that elevated levels of distorted thinking may subtly impact one's choice of individual coping patterns, the effects of which may not become apparent unless one looks cumulatively towards a *consistent* use or pattern of using threat based coping strategies.

**Correlations between cognitive errors and coping patterns at late therapy**

Threat coping was significantly correlated with the presence of negative cognitive errors. However, in the non-recovered group it was also found that the more positive cognitive errors people had, the less likely they were to use threat based coping patterns. This result may be explained by previous research suggesting that positive CEs may be a form of wishful thinking in the form of denial of negativity as opposed to realistic appraisals of environmental stimuli (Blake, Dobson, & Drapeau, 2011).

**Correlations between change in coping patterns and change in depressive symptoms**

It was hypothesized that greater decreases in depression would be positively related to greater decreases in threat based coping patterns and greater increases in challenge based coping patterns. Results for the entire group indicated that only the first hypothesis was supported. When recovered and non-recovered participants were examined separately, no significant correlations were observed for the recovered group between change in depression and change in any coping variable. Among the non-recovered, decreases in depression were

associated with decreases in support-seeking and negotiation, both of which are challenge based coping patterns.

**Limitations and strengths of the study and contribution to existing knowledge**

One limitation of the study was that the nature of stressors was not assessed, making it difficult to ascertain if threat and challenge appraisal based coping patterns were congruent with the demands of environmental stressors and with an individual's available resources. However, the model of stress and coping by Lazarus and Folkman (1984), which is the foundation of the Coping Patterns Rating System (Perry et al., 2007), is considered to be a cognitive model (Gunthert et al., 2005), thus allowing for an assessment from the client's perspective, which is essentially of interest. The gap or overlap between reality and perception cannot be accounted for without knowledge of the actual stressors being coped with. Similarly, the manner in which participants described their ways of coping may have seemed like one type of coping, when in fact another type of coping may have been used. For example, searching for answers might have been reported by participants as information-seeking, therefore resulting in that type of coding. However had a therapist probed this instance of information-seeking, it could be that in fact rumination was taking place.

A strength of the study was the use of a new instrument, the Coping Patterns Rating System (Perry et al., 2007) which was advantageous because it allowed for an assessment of all possible types of coping patterns, and within the same study. This is a contribution to the coping literature because most of the

existing scales have assessed coping according to only two or three dimensions, which are problematic not only due to lack of specificity, but also in terms of validity and reliability, to the point that it has been recommended that the most commonly used coping scales no longer be used (for a review, see Skinner et al., 2003).

Additionally, this study examined coping and cognitive errors within the same study, which was novel as most previous research as not integrated these two separate bodies of literature. Finally, the study also involved detailed coding of coping patterns as they occurred during early and late therapy sessions. This contributed to the paucity of knowledge about the role of coping patterns in depression and how coping patterns change over the course of cognitive therapy, and provided a new methodological perspective, that of observer-raters as opposed to traditional self-report assessments.

**Implications for research and clinical practice**

The finding that both self-reliance and isolation increased from early to late therapy for the group may be worthy of additional attention. Practitioners may wish to be vigilant towards helping depressed clients navigate the fine nuances between self-sufficiency and becoming overly self-reliant to the point isolating oneself from others. Another implication for research and practice is based on findings that hopelessness decreased, and that accommodation and self-reliance increased for the group, which provides support for CBT models that emphasize the roles of these variables. However, there is also a confounding effect due to saliency factors. By saliency, it is meant that CBT models focuses extensively on

the role of helplessness in depression and on the importance of teaching cognitive restructuring (i.e., accommodation), and Western values emphasize self-reliance. This may mean that due to saliency, these coping patterns were effectively targeted and addressed during therapy. However, previous research has also shown the value of flexibility of psychological processes in mental health (Drapeau et al., 2011). As such, future research and clinical practice may wish to develop additional coping training modules which may also be of benefit to clients, such as negotiation skills, which could provide clients with a greater range of coping options, and promoting chances for flexibility in use of coping patterns. Findings also indicated that use of problem-solving did not increase over the course of CT, and the implications of this for future research and clinical practice may be to investigate where problem-solving skills go awry in depression. While many components of problem-solving were captured by the Coping Patterns Rating System (Perry et al., 2007), problem-solving has also been described as a complete process with many steps (D'Zurilla & Nezu, 1982), the 'package' of which was not examined in the current study.

Finally, CBT emphasizes an 'intraspychic' model of thoughts, feelings, and behaviours (Dobson & Dobson, 2009), but the current study found that interpersonal processes such as use of opposition and delegation coping patterns were associated with higher levels of depression at early therapy. As such, perhaps presenting the CBT model as a mirror image of itself can help clients to understand how their intrapsychic activities are reciprocally influenced by the intrapsychic activities of others. For example, if person A holds the core belief

that they are incompetent, they may delegate tasks to person B. Person B may then respond by completing tasks for person A (perhaps because she or he has the core belief of being competent). After continuously delegating tasks, person A may have produced actual evidence that they are not competent, especially if comparing her or himself to person B. At some point person A may come to conclude that person B should not have done the tasks for her or him, thus attributing person B to have caused the problem. As such, person A might feel helpless and incapable to change the situation, and falsely believe that person B must change in order for her or him to feel better. However, as an intrapsychic model, CBT emphasizes how person A can break the pattern between these two people by changing her or his own behaviours or thought patterns. This does not negate person B's (or person A's) contribution to the cause or maintenance of the problem over time, but isolates the capacity for an effective solution to be generated within either person A or B. A mirror image model of CBT would maintain CBT's stance as an intrapsychic therapy while illustrating how intrapsychic patterns combine during interpersonal interactions. A mirror image model might help to distinguish between causal and maintaining factors in emotional disorders, and 'points of entry' for which to implement solutions, be it at the level of altering one's distorted ways of thinking or continued use of coping patterns that are associated with depressive symptoms, as opposed to leading people towards their goals for emotional wellbeing.

**Table 1:**
**The Coping Patterns Rating System (Perry, Drapeau, & Dunkley, 2007)**

| Coping | Definition | Examples |
|---|---|---|
| Problem-solving | "Dealing with a stressor by attempting to understand and solve it as a problem and effect a desirable solution." | Affective: "feeling confident in one's efforts, determined, encouraged." Behavioral: "taking instrumental action to effect an outcome, repairing, mastering, testing a hypothesis about what to do." Cognitive: "strategizing, planning, forming hypotheses of what to do." |
| Information-seeking | "Information-seeking deals with a stressor by attempting to gather information which may aid in dealing with it." | Affective: "interest, hope, optimism, emphasizing the desire to know something." Behavioral: "reading, observation, asking questions, testing a situation." Cognitive: "having an inquisitive attitude, being open, trying to gain insight into oneself or another, self-reflection." |
| Helplessness | "Helplessness deals with a stressor by giving up trying to deal with it oneself, while expressing distress about the situation." | Affective: "exhaustion, discouragement, feeling guilty." Behavioral: "acting helpless, flailing, random unconsidered attempts to cope, giving up trying anything". Cognitive: "confusion as to what to do, Cognitive exhaustion, inability to think about a problem any further, self-doubt, belief that one can't do anything about a problem, non-problem-solving rumination about problems" |
| Escape | "Escape deals with a stressor by disengaging and avoiding trying to deal with it whatsoever." | Affective: "Wishful thinking". Behavioral: "behavioral avoidance, fleeing, procrastination, distracting oneself by an action". Cognitive: "cognitive avoidance, distracting oneself in thinking, denial, changing a topic to another topic to avoid discussing difficult material" |
| Self-reliance | "The individual uses his or her own personal resources to deal with a stressor." | Affective: self-soothing, concern for others, accepting responsibility, venting one's feelings in order to regulate one's emotional responses to stressors, talking in order to experience relief. Behavioral: shouldering a burden, shielding, protection, self-assertion. Cognitive: positive self-talk with respect to one's own capacity to deal with a problem. |
| Support-seeking | "Support-seeking deals with a stressor by seeking, finding or engaging social resources which will aid in effecting a desired outcome." | Affective: "seeking comfort, spiritual support". Behavioral: "seeking contact, asking for help or instrumental aid". Cognitive: "expressing a belief about the importance of obtaining others' support." |

| | | |
|---|---|---|
| Delegation | **"**Delegation deals with a stressor by overtly or covertly leaving it to others rather than oneself to deal with the stressor." | Affective: "self-pity, complaining, whining." Behavioral: "abandoning efforts to cope and instead telling others that they have to do something, pestering others to do something, acting dependent, clinging." Cognitive: "believing oneself helpless and that others have to do something." |
| Isolation | **"**Isolation deals with a stressor by withdrawing from it or isolating oneself." | Affective: "feeling afraid to show oneself related to the stressor, feeling afraid to be around others." Behavioral: "social withdrawal, concealing oneself, avoiding others, freezing." Cognitive: "believing that one should avoid others." |
| Accommodation | **"**Accommodation deals with a stressor by coming to some compromise or acceptance of what can and cannot be changed in the stressor or as a result of it." | Affective: "acceptance of limitations, conviction, feeling committed, endorsement of an accommodation." Behavioral: "cooperation, conceding to others, committed compliance." Cognitive: "cognitive restructuring, re-framing, cognitive distraction, minimization." |
| Negotiation | **"**Negotiation deals with a stressor by attempts to develop new options beyond those at hand." | Affective: "feel like making a deal." Behavioral: "bargaining, attempting to persuade, compromising to get some of what one wants." Cognitive: "setting priorities, goal-setting, taking others' perspective, decision-making." |
| Submission | **"**Submission deals with a stressor by giving into others and giving up on effecting one's own preferences." | Affective: "self-blame, fear of engaging others or expressing oneself, hiding one's emotions from a dominant other." Behavioral: "giving in, doing what one is told without thought, failure to act as one believes one should in response to a stressor (unresponsiveness)." Cognitive: "believing the stressor cannot be engaged, reasoning why one should avoid expressing oneself or avoid dealing with a situation, which results in submitting to the status quo. It does not matter whether the person's perception of the consequences of not submitting is accurate." |
| Opposition | **"**Opposition deals with a stressor by confronting it and attempting to remove any constraints imposed on one's preferences." | Affective: "aggressive feelings towards others, venting, reacting emotionally to others as if they are the problem." Behavioral: "standing and fight, defiance, seeking revenge." Cognitive: "blame others, projection, rationalizing one's own oppositional or defiant actions." |

**Table 2:**
**Actual number of Coping Patterns in an average 50-minute Session of Early Therapy, (*N = 45*)**

| | *M* | *SD* | | *M* | *SD* |
|---|---|---|---|---|---|
| **Challenge based coping** | 12.51 | 7.03 | **Threat based coping** | 6.13 | 4.01 |
| Information-seeking | 3.56 | 2.45 | Helplessness | 2.96 | 2.55 |
| Problem-solving | 3.31 | 2.92 | Opposition | .84 | 1.33 |
| Self-reliance | 2.53 | 2.52 | Escape | .73 | 1.07 |
| Accommodation | 1.73 | 1.50 | Submission | .67 | 1.04 |
| Support-seeking | 1.09 | 1.14 | Isolation | .67 | .88 |
| Negotiation | .29 | . 63 | Delegation | .27 | .50 |

**Table 3:**
**Cognitive Therapy and Change in Coping Patterns for All Participants**
**(*N = 45*)**

| Coping/1000 words | Early Therapy | Late Therapy | *Z* | *p* |
|---|---|---|---|---|
| Total coping patterns | 5.55 (2.19 – 11.93) | 5.63 (2.52 – 11.18) | -.20 | .84 |
| **Challenge coping** | 3.79 (1.28 – 7.99) | 3.98 (.42 – 10.25) | -.95 | .34 |
| Problem-solving | .77 (.00 – 4.50) | 1.02 (.00 – 3.90) | -.32 | .75 |
| Information-seeking | 1.00 (.00 – 5.13) | .96 (.00 – 3.72) | -.48 | .63 |
| Self-reliance | .59 (.00 – 1.97) | 1.00 (.00 – 2.41) | -2.07 | .04 |
| Support-seeking | .31 (.00 – 1.72) | .25 (.00 1.46) | -.69 | .49 |
| Accommodation | .47 (.00 – 3.98) | .81 (.00 – 4.69) | -2.57 | .01 |
| Negotiation | .00 (.00 - .36) | .00 (.00 - .42) | -1.22 | .22 |
| **Threat coping** | 1.76 (.27 – 5.96) | .87 (.00 – 7.76) | -2.15 | .03 |
| Helplessness | .85 (.00 – 5.96) | .34 (.00 – 5.60) | -2.21 | .03 |
| Escape | .00 (.00 – 1.80) | .00 (.00 - .86) | -1.12 | .26 |
| Delegation | .00 (.00 - .98) | .00 (.00 – 1.98) | -.10 | .92 |
| Isolation | .00 (.00 - .94) | .00 (.00 – 1.44) | -1.99 | .04 |
| Submission | .00 (.00 – 1.17) | .00 (.00 – 1.06) | -.85 | .39 |
| Opposition | .00 (.00 – 1.41) | .00 (.00 – 1.93) | -.32 | .75 |

Note. Wilcoxon signed ranks test.

**Table 4:**
**Recovered vs. Non-Recovered Participants and Coping Patterns at Early and Late Therapy**

| Coping/1000 words | Recovered ($n$ = 24) | Non-recovered ($n$ = 20) | $U$ | $p$ |
|---|---|---|---|---|
| **Early Therapy** | | | | |
| Total coping patterns | 5.45 (2.18 – 8.59) | 5.52 (2.81 – 11.93) | 219.00 | .62 |
| Challenge coping | 3.59 (1.41 – 6.18) | 3.78 (1.28 – 7.99) | 221.00 | . 65 |
| Problem-solving | .84 (.00 – 3.09) | .65 (.00 – 4.50) | 205.00 | .41 |
| Information-seeking | 1.01 (.00 – 2.83) | .97 (.00 – 5.13) | 220.50 | .65 |
| Self-reliance | .77 (.00 – 1.97) | .43 (.00 – 1.84) | 167.00 | .09 |
| Support-seeking | .30 (.00 – 1.72) | .33 (.00 – 1.84) | 218.00 | .60 |
| Accommodation | . 54 (.00 – 1.51) | .39 (.00 – 3.98) | 210.50 | .48 |
| Negotiation | .00 (.00 - .36) | .00 (.00 - .35) | 193.50 | .14 |
| Threat coping | 1.74 (.27 – 3.60) | 1.76 (.34 – 5.96) | 213.00 | .53 |
| Helplessness | 1.08 (.00 – 2.29) | .50 (.00 – 5.96) | 209.50 | .47 |
| Escape | .28 (.00 – 1.80) | .00 (.00 - .50) | 156.00 | .03 |
| Delegation | .00 (.00 - .33) | .00 (.00 - .98) | 169.00 | .03 |
| Isolation | .00 (.00 - .94) | .00 (.00 - .70) | 226.50 | .73 |
| Submission | .00 (.00 - .60) | .19 (.00 – 1.17) | 190.00 | .19 |
| Opposition | .00 (.00 - .63) | .24 (.00 – 1.41) | 142.00 | .01 |
| **Late Therapy** | | | | |
| Total coping patterns | 5.31 (2.71 – 10.45) | 5.89 (2.51 – 11.18) | 212.00 | .51 |
| Challenge coping | 4.54 (1.88 – 10.25) | 3.85 (.42 – 9.73) | 185.00 | .20 |
| Problem-solving | 1.04 (.00 – 3.90) | .97 (.00 – 2.13) | 234.00 | .89 |
| Information-seeking | .92 (.29 – 3.72) | .97 (.00 – 3.25) | 235.00 | .91 |
| Self-reliance | 1.17 (.00 – 2.41) | .88 (.00 – 1.93) | 187.50 | .22 |
| Support-seeking | .30 (.00 – 1.46) | .09 (.00 – 1.04) | 193.00 | .25 |
| Accommodation | .98 (.00 – 3.16) | .59 (.00 – 4.69) | 198.50 | .33 |
| Negotiation | .00 (.00 - .29) | .00 (.00 - .42) | 236.00 | .86 |
| Threat coping | .62 (.00 – 3.59) | 1.40 (.20 – 7.76) | 146.00 | .03 |
| Helplessness | .00 (.00 – 1.51) | .47 (.00 – 5.60) | 157.00 | .04 |
| Escape | .00 (.00 - .72) | .12 (.00 - .86) | 195.00 | .23 |
| Delegation | .00 (.00 - .21) | .00 (.00 – 1.98) | 163.50 | .007 |
| Isolation | .00 (.00 – 1.44) | .00 (.00 - .45) | 184.50 | .10 |
| Submission | .00 (.00 – 1.06) | .00 (.00 - .72) | 216.50 | .50 |
| Opposition | .07 (.00 - .72) | .00 (.00 – 1.93) | 234.00 | .88 |

Note. Mann-Whitney test (2-tailed).

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# CHAPTER 6

## Conclusion

## Summary of Findings and Original Contributions to Research

This dissertation provided a thorough review of the literature on the role of cognitive errors and coping patterns in depression, as well as what is currently known about changes in these variables over the course of cognitive behavioural therapy. A series of three studies ensued to investigate several gaps in the existing literature.

The three manuscripts that comprise this dissertation provided unique contributions to the field of psychotherapy theory, research, and practice. First, the studies provided an in-depth analysis of the type and frequency of 30 cognitive errors (CEs) and 12 coping patterns in a sample of depressed participants. The focus on cognitive errors was unique as previous research into cognitive distortions has focused almost exclusively on automatic thoughts and dysfunctional attitudes. Further, most studies report distortion as total number, rather than including the type and frequency of specific distortions, or report distortions only in the negative rather than in positive and negative directions. Similarly, research into coping patterns is usually not included in CBT studies, or is assessed in only a few domains. Further, these domains have been deemed insufficient for further use as there are many problems with validity and reliability (Skinner et al., 2003). Therefore, the current research contributed to existing knowledge by providing a detailed summary of the type and frequency of

negative and positive CEs and 12 exhaustive, functionally homogenous coping patterns. These descriptive data can serve as bench marks for future studies.

Second, the research was conducted using a sample of depressed participants and assessments of cognitive errors and coping patterns were made during the course of therapy. Much previous research into cognitive errors and coping patterns has been conducted in laboratory settings, with college students, and in dysphoric rather than depressed samples. Therefore this researched provide a more naturalist and authentic assessment of cognitive errors and coping patterns in depression.

Third, the dissertation assessed cognitive errors and coping patterns using an observer-rated measure. This method allowed for detailed coding of therapy transcripts to capture cognitive errors and coping patterns in-vivo, which circumvented many of the limitations associated with traditional self-report measures, and added another perspective from which to analyze the data.

After a comprehensive assessment of cognitive errors and coping patterns in depression had been obtained, this dissertation examined changes in these variables from early to late cognitive therapy. The main findings of the dissertation have been summarized below.

**Cognitive errors and coping patterns characteristic of Depression**

**Early therapy profile.** Depression was characterized by significantly more negative than positive CEs, the six most common of which were labeling negative, should and must negative, jumping to conclusions negative, mind-reading negative, overgeneralizing negative, and fortune telling negative, which

are consistent with theoretical formulations of depression (Beck et al., 1979; Ellis, 1980). Despite the prevalence of more negative than positive CEs at early therapy, participants were found to have used more challenge based than threat based coping patterns at early therapy. Coping patterns from most to least commonly used were information-seeking, problem-solving, helplessness, self-reliance, accommodation, support-seeking, escape, opposition, isolation, submission, delegation, and negotiation.

**Associations between depression, cognitive errors, and coping patterns.** Contrary to previous research finding indicating a positive relationship between cognitive distortions and depression (e.g., DeRubeis et al., 1990; Furlong & Oei, 2002; Oei & Shuttlewood, 1997; Oei & Sullivan, 1999), the current research found that cognitive errors were not related to *degree* of depressive symptoms but to *presence* of depression. This conclusion was made as only two of 30 CEs significantly correlated depressive symptoms at early therapy, high distorters did not differ from low distorters in their severity of depressive symptoms at early therapy, and recovered participants had fewer total CEs, negative CEs, and negative overgeneralization cluster CEs than non-recovered participants. Perhaps the current research's lack of agreement with previous findings was due to the fact that an observer rated measure of distortion was used for the current study and self-report measures were typically used in the other studies. Previous research has indicated non-significant levels of agreement exist between self-report and observer-rated measures of coping (Kramer, Drapeau, Khazaal, & Bodenmann, 2009), perhaps the same is true of distortion. Taken

together, however, self report methods and observer rated methods may give a more complete picture of the phenomena.

Of the 12 coping patterns, only delegation and opposition were found to be significantly correlated with depression at early therapy. When threat and challenge based coping patterns were combined into their respective groups, threat based coping was associated with depression and an inverse non-significant relationship was found between depression and challenge based coping.

In terms of the associations between the 30 cognitive errors and threat and challenged based coping patterns, no cognitive errors significantly correlated with challenge based coping, and only two negative CEs correlated with threat based coping (all-or-nothing negative and jumping to conclusions negative). Additionally, high distorters were found to have used more threat based coping patterns than did low distorters at early therapy, and no differences were found for challenge based coping.

Together, the above findings suggest that compared to positive CEs, negative CEs are more strongly associated with higher levels of depressive symptoms and greater use of threat based coping patterns. Additionally, threat based coping patterns are more strongly associated with depressive symptoms than are challenge based coping patterns. This suggests that negativity plays a key role in the presentation of depression, as cognitive models suggest (Beck et al., 1979; Ellis, 1980; Seligman 1972; Seligman, 1991; Seligman, Abramson, Semmel, von Baeyer, 1979).

**Changes in cognitive errors and coping patterns over the course of cognitive therapy**

Total numbers of cognitive errors and coping patterns did not change for the participants from early to late therapy; however, specific changes were observed. In terms of CEs, negative CEs demonstrated a non-significant decline, and positive CEs significantly increased. Across all comparisons, negative CEs outnumbered their positive counterpart, with the exception that fortune telling positive became higher than fortune telling negative by late therapy, suggesting that hopefulness had increased. Congruent with the idea that hope had increased was the finding that helplessness coping decreased for the group from early to late therapy. Other group-level changes included increases in self-reliance, isolation, and accommodation. Overall, threat based coping decreased from early to and challenge based coping did not significantly change.

**Potential change mechanisms in cognitive therapy**

In order to examine potential change mechanisms in cognitive therapy, participants who recovered were compared to participants who did not recover on both early and late therapy cognitive errors and coping patterns. Results indicated that both groups did not significantly differ from one another at early therapy on any of the coping or cognitive error variables, with the exception that participants who recovered had higher levels of escape coping at early therapy, and those who did not recover had higher levels of delegation coping at early therapy. However, by late therapy the recovered group was found to have fewer threat based coping patterns, including helplessness and delegation. Therefore, reducing helplessness

may be important in recovery from depression, which is consistent with the helplessness model of depression by Seligman and colleagues (Seligman 1972; Seligman, 1991; Seligman, Abramson, Semmel, von Baeyer, 1979), as well as therapies emphasizing behavioural activation (e.g., Dimidjian, Martell, , Addis, , & Herman-Dunn, , 2008; Jacobson et al., 1996; 2000). Reducing delegation may also be important as delegation was elevated among non-recovered participants, and was also positively associated with depressive symptoms at early therapy. Delegation is also closely linked to helplessness, as helplessness has been defined as giving up trying anything, and delegation has been defined as overtly or covertly leaving tasks to others (Perry et al., 2007).

Changes among recovered and non-recovered participants suggest important elements of change. First, the only change in coping patterns observed in participants who did not recover was a decrease in isolation from early to late therapy. In contrast, the recovered group was found to increase their accommodation (e.g., cognitive restructuring) coping patterns, and reduce their use of helplessness and escape coping patterns. Theoretical writings (e.g., Beck et al., 1979) focus on targeting these coping patterns, which provides empirical evidence for their utility.

In terms of cognitive variables, distortion status was found not to be related to quantity or type of changes in either cognitive errors or coping patterns, nor in rates of recovery from depression. Therefore, CBT seems to be appropriate for both low and high distorters equally. What seems to be more related to recovery from depression is the ability to reduce one's negative distortions.

While both recovered and non-recovered participants were found to have increased their number of positive CEs, only the recovered group was found to have decreased their levels of negative CEs, and negative selective abstraction.

**Implications for clinical practice**

When clinical wisdom is supported by empirical findings, such as evidence pertaining to the roles of cognitive errors and coping patterns in depression, increased credibility for the interventions used by practitioners is achieved, and the profession of psychology as a whole is further legitimized. However, disagreements with theoretical intentions are also useful as feedback helps to refine how clinical interventions are implemented.

The research findings indicated that the severity of a depressive episode may not be associated with higher levels of cognitive errors, but to degree of helplessness and oppositional coping patterns. Implications of this for clinical practice are that practitioners may wish to be mindful of the degree to which they focus on helping clients to restructure their cognitions vs. focusing on the amelioration of coping skills. Another finding was that recovered participants decreased their negative CEs from early to late therapy while non-recovered participants did now show a reduction in negative CEs. As such, it may be important for practitioners to ensure that all clients are learning how to effectively restructure their negative cognitions. This includes learning how to re-frame negative thoughts into positive ones, while still remaining realistic. An emphasis on realistic thinking is emphasized in the theoretical writings on cognitive therapy (Beck et al., 1979), but this does not seem to be translating into practice given that

all participants demonstrated an increase in positive errors by late therapy. Practitioners may wish be more vigilant towards ensuring that the fundamental principle of cognitive therapy - reality testing- is learned, as this is a *qualitatively* different process of thinking that is more intentional and reflective than the automatic, heuristic-based thinking that typically characterizes depressive ruminations.

A final implication for clinical practice is that high and low distorters may be equally likely to benefit from cognitive therapy. This is likely due to the therapy's emphasis on both cognitive restructuring techniques and the amelioration of coping skills.

**Directions for future research**

Future research may wish to examine the long-term implications of positive cognitive errors on depression. For example, do cognitive errors create unrealistically positive expectations about the future that lead to greater disappointments when things don't work out? Do positive CEs "buffer" against negative life realities? Or do positive CEs lead to optimistic engagement with the environment, thus propelling people towards the production of more positive outcomes?

Other avenues for future research may include investigating the meaning and importance of CEs and coping patterns to the individual. For example, after cognitive errors and coping patterns have been coded in a transcript, the transcript could be discussed with the participant to obtain the meaning of the items. Future research may wish to correlate the observer-rated measures of cognitive errors and

coping patterns used in the current studies with existing self-report measures, as a way of understanding the different contributions that can be made from different types of assessment tools. Until further process research on change in CBT is conducted, most improvements made to the treatment will be theory based, rather than empirically based.

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APPENDIX A.

## The Cognitive Errors Rating System

## (CERS; Drapeau, Perry, & Dunkley, 2008)

**Cluster A. Fortune telling**
1. Fortune telling: "Fortune Telling is making the assumption that the worst or best possible outcome will occur in a situation." (p. 18)

**Cluster B. Overgneralization**
2. Labeling: "The individual puts a fixed global label on him or herself or others without considering that the evidence might more reasonably lead to a less disastrous or less positive conclusion." (p. 23)

3. Overgeneralizing: "The individual makes a sweeping negative or positive conclusion that goes far beyond the situation." (p. 26)

**Cluster C. Selective Abstraction**
4. All-or-nothing thinking: "The individual views a situation as fitting into one of only two opposing categories, rather than as a mixture or on a continuum between the two." (p. 29)

5. Discounting the positive or negative: "The individual selectively dismisses, disqualifies or discounts information that is positive or negative, thus keeping only one valence of information as true, relevant or important." (p. 31)

6. Emotional reasoning: "The individual thinks something must be true because he or she feels and believes it to be true, while ignoring or discounting evidence to the contrary." (p. 33)

7. Magnification and/or minimization of the negative or positive: "When evaluating oneself or another person or a situation, the individual unreasonably magnifies the negative or minimizes the positive, or the converse." (p. 34)

8. Mental filter: "The individual pays undue and complete attention to only one aspect of an individual or situation without any acknowledgment of the other sides of the issue which would yield a whole picture." (p. 37)

9. Should and must statements: "With should and must statements, the individual has a precise and fixed idea of how others or oneself should behave." (p. 40)

10. Tunnel vision: “With tunnel vision, the individual sees only the negative (or positive) aspects of a situation, or fails to see, or denies any positives (or negatives) in a situation.” (p. 41)

11. Jumping to conclusions: “The individual takes one or two facts and draws unwarranted conclusions.” (p. 43)

**Cluster D. Personalizing**

12. Mind-reading: “With mind-reading, the individual believes he or she knows what others are thinking (positive or negative), failing to consider other more likely possibilities.” (p. 47)

13. Personalization: “The individual takes things overly personally, believing that others are behaving positively or negatively or events are happening because of him or herself, without considering more plausible explanations for their behaviors or for the events, which may not involve oneself.” (p. 49)

14. Inappropriate blaming or crediting of self while ignoring the role of others: “In inappropriate blaming of self, while ignoring the roles of others, the individual takes blame for something that has gone wrong upon him or herself, while inappropriately leaving out the contributions of others to the same problem. Examples of this include putting oneself in the scapegoat role. In inappropriate crediting of self, while ignoring the roles of others, the individual takes undue credit for something, while inappropriately leaving out the contributions of others.” (p. 51)

15. Inappropriate blaming or crediting of others while ignoring the role of self: “In inappropriate blaming of others, while ignoring the role of oneself, the individual blames others for something that has gone wrong, while inappropriately leaving out his or her own contribution to the same problem. In inappropriate crediting of others, while ignoring the role of self, the individual gives undue credit to others for something, while inappropriately leaving out his or her own contribution.” (p. 53)