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Relationship Between Cognitive Distortions and Psychological Disorders Across Diagnostic Axes

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THE RELATIONSHIP BETWEEN COGNITIVE DISTORTIONS AND
PSYCHOLOGICAL DISORDERS ACROSS DIAGNOSTIC AXES

By Bradley M. Rosenfield

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Dissertation Approval

This is to certify that the thesis presented to us by Bradley Rosenfield on the 5th day of October 2004, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

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Abstract

The Relationship Between Cognitive Distortions and Psychological Disorders Across Diagnostic Axes

The purpose of this study was twofold: First, the study sought to determine whether or not cognitive distortions correlated with the number and severity of psychological disorders across diagnostic axes. Second, the study endeavored to assess further the validity and reliability of a promising new self-report measure, The Inventory of Cognitive Distortions (ICD), by correlating this instrument with clinical diagnoses as determined by the Millon Clinical Multiaxial Inventory-III. The sample was selected from a heterogeneous adult outpatient population. Participants meeting inclusion criteria presented for psychological treatment or assessment. Excluded were participants who had less than an eighth grade education, or who met diagnostic criteria for a number of neurological disorders. The study was correlational in design. Results supported the reliability and validity of the ICD as an assessment instrument measuring cognitive distortions, because the ICD determined that approximately half of the variance in both the number and severity of psychological dysfunction, on both Axis I and Axis II, was accounted for by the frequency of cognitive distortions.
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Prevalence of Mental Health Disorders

Psychological disorders are surprisingly common in the United States and abroad. According to The U.S. Department of Health and Human Services (1999) approximately 22% of American adults over the age of 18 years—or over 44 million people—suffer from a diagnosable mental disorder in a given year. The most common maladies are the anxiety and depressive disorders, which affect 16.4 and 7.1%, respectively, of the American population each year. Personality disorders (PDs) are believed to cause distress for 2.1% of the American population and for many of those with whom they interact. It is also estimated that schizophrenia affects 1.3% of the U.S. population. Comorbidity among the various disorders, even across clinical axes is also common (Reiger, Narrow, Pae, Manderscherd, Lockem & Goodwin, 1993; Kessler, McGonagle, Zhoa, Nelson, Hughes, Eshleman et al, 1994; Weissman, Bland, Canino, Faravelli, Greenwald, Hwa et al, 1997; Millon, 1999).

It is logical that millions of those suffering from these disorders would seek treatment to alleviate their distress and to improve their functioning. Empirically supported psychological treatments have found increasing acceptance among professionals, given the pressures arising from managed care, from fiscal constraints, from the public’s growing psychological sophistication, and from potential accusations of malpractice should therapy be ineffectual, or worse, cause harm (e.g, American Psychological Association [APA], 2004; Hawley & Weisz,
2002). Cognitive therapy (CT) is in the vanguard of evidenced-based psychological treatments, both in the U.S. and, increasingly, around the world (Dobson & Khatri, 2000).

The Rise of the Cognitive Model

CT evolved during a tumultuous time in the development of effective psychotherapy. During this period two competing, dominant factions, the psychoanalytic (e.g., Freud, 1899/1962; Sulloway, 1979) and behavioral schools (e.g., Skinner, 1958; Wolpe, 1958) were competing with a popular nonconformist theory: the client-centered humanistic approach (Rogers, 1951).

While yet a practicing psychoanalyst, Beck (1961) adroitly discerned that his depressed patients were often vaguely aware of certain negative thoughts that they frequently failed to report during free association. These negative thoughts composed part of a constellation of cognitions, which he described as “verbal and pictorial events in the stream of consciousness… based on attitudes, assumptions,” expectations, and schema (Beck, Rush, Shaw, & Emery, 1979, p. 4). Because these cognitions resided mainly outside of conscious control and occurred without volition, they were labeled automatic. As a trained psychoanalyst, Beck compared these automatic thoughts to Freud’s notion of the preconscious. This original cognitive model of depression proposed that patients may not have been aware of the automatic thoughts, yet they could become acutely aware of the negative affect that such cognitions could engender. These automatic thoughts were subject to specific types of logical errors or cognitive distortions, which were labeled “selective abstraction, overgeneralization, dichotomous thinking, and exaggeration (of the negative aspects of their experiences)” (Beck, 1991, p. 368). One’s cognitions, arising from past experience, become habitual patterns of thought about the self, the world, and the
future, which profoundly influence one’s affect and behavior (Beck & Freeman, 1990; Beck et al., 1979; Beck, Freeman, Davis, & Associates, 2004; Beck Wright, & Newman, 1993; Ellis & Geiger, 1977).

Moreover, both Ellis (1958, 1962, 1973) and Beck (1961, 1964, 1967, 1976) recognized that neither excavation of early childhood trauma nor modification of stimulus-response patterns was sufficient to produce enduring change in human emotion and behavior. They similarly viewed the non-directive humanistic approach as inefficient and without empirical support. Instead, these theorists discerned a number of patterns of dysfunctional thinking among their patients. For example, Ellis (1958, 1962, 1973) proposed 11 irrational beliefs that he believed predisposed individuals to negative emotional and behavioral consequences.

Similarly, Beck (1967) coined the term “cognitive therapy” after discovering a correlation between the negative thinking and the moods of his depressed patients. By identifying, exploring, and modifying these frequently inaccurate cognitions, Beck (1964, 1967, 1979) witnessed a distinct improvement in his patients’ moods. Consequently, Ellis, Beck and their adherents viewed dysfunctional cognitive processes as primary targets for psychotherapy.

Beck further proposed that automatic thoughts, which arise from interpretations of events, are themselves based on a network of secondary beliefs, assumptions, formulas, and rules that are often connected to relevant memories. At a still deeper level are more absolute, dysfunctional beliefs about the self, or schemas, such as “I am unlovable.”; “I am a loser.”; “I am worthless.” These cognitive structures develop early in life from personal experiences, from identification with others, and from reinforcement (Beck, 1967; Beck & Weishaar, 1995). Thus persistent patterns of generalizing, deleting, and otherwise distorting internal and external stimuli foster a confirmatory bias which supports a constellation of beliefs that may not accurately reflect one’s
current environment (Alford & Beck, 1997; Yurica, 2002). When this occurs, cognition is said to be distorted.

For example, one’s belief system can shape experience in ways that are analogous to optical lenses. Prescription glasses that are carefully crafted to help a child to see the world more clearly may need to be adjusted as the child matures. Lenses that are not properly altered may later distort events so drastically that they impair functioning and cause great distress.

Similarly, schemas or subjective beliefs about one’s own self, shaped by early childhood experience may foster rules, assumptions, and expectations that no longer suit the real world. When this occurs, cognitive distortions may arise that systematically misrepresent reality, cause impairment and distress, and prevent individuals from resolving their own problems. Thus, cognitive distortions play a fundamental role in the onset, maintenance, and ultimately, the amelioration of all manner of psychological dysfunction, be they Axis I and II disorders (e.g., Beck et al., 2004). Beck et al. (1979) proposed that individuals distort reality in six distinct ways. Since then, many types of cognitive distortions have been postulated (Burns, 1980, 1999; Freeman & Oster, 1999; Yurica, 2002), all of which represent inaccuracies and misattributions in interpreting interpersonal and contextual information (Giancola, Mezzich, Clark, & Tarter, 1999).

Cognitively based therapies have been conceptualized in a variety of ways. Ellis (1962) originally posited the idea that irrational beliefs foster emotional distress and functional impairment. Alternately, Meichenbaum (1975) suggested that self-talk, that is, one’s internal dialogue is the fundamental mediator of affect and behavior. Finally, it has been postulated that both emotional disorders (Beck, 1967, 1976) and PDs (Beck & Freeman, 1990; Beck et al., 2004) result from maladaptive cognitive processing, manifested by dysfunctional core beliefs and associated cognitive distortions.

CT and cognitive-behavior therapies (CBT) have subsequently evolved to include CT (Beck, 1967; Beck et al., 1979), rational emotive behavioral therapy (Ellis & Grieger, 1977), problem-solving therapy (D’Zurilla & Nezu, 1990; Nezu, 1986), narrative therapy, (e.g., White & Epston, 1989), and self-instructional therapy (Meichenbaum, 1993).

Moreover, cognitively oriented therapies have gained growing acceptance throughout the mental health community and, more generally, across the entire healthcare industry (Meichenbaum & Turk, 1987; Robins, Gosling, & Craik, 1999). In fact, cognitively oriented psychotherapy has gained such prominence that Robins, et al. (1999) determined this modality to be the fastest growing choice for treatment throughout the last four decades, as measured by the subject matter of published dissertations, leading psychological journals, and subdisciplinary journals. Consequently, according to these objective measures, the preeminent psychotherapy models today appear to be the cognitive and cognitive behavioral. And, common to these schools of thought is the recognition of the fundamental role of cognitive distortion in psychopathology.
Progress in psychotherapy has been predicated upon a number of important variables. First, the science and profession of clinical psychology has become increasingly concerned with incorporating scientifically supported treatment into progressively more evidence-based clinical practice. Thus, the synthesis of the scientist-practitioner (Raimy, 1950) and practitioner-scholar models has allowed the field to advance, incrementally and systematically, by incorporating empirical findings and scholarly theories directly into clinical practice (Belar & Perry, 1992).

Next, legitimate empirical research is itself based upon the use of standardized procedures in order to allow consistent application of procedures and to facilitate replication. This requires valid and reliable instruments to measure results (Kazdin, 1998). Consequently, the validation of psychometrically sound instruments is a prerequisite for the advancement of empirically validated treatments for wide range of psychological disorders.

Finally, pressures from managed care and from distressed patients seeking relief have increased the need for optimally efficient and effective therapy (McDaniel, 1995). This has generated increasing demand for manualized treatment approaches with proven efficacy, which can be further augmented by incorporating empirically validated, standardized assessment measures (Gilson & Freeman, 1990; Beck et al., 2004). Moreover, it is incumbent upon both scientists and practitioners to demonstrate successful treatment outcome objectively. This requires the measurement of cognitive and behavioral variables (Dobson & Khatri, 2000).

Beck (1993) asserted that CT has gained preeminence because of its reliance on scientific method and ability to assimilate empirical findings. Evidence for effectiveness of CT and CBT has been demonstrated for the treatment of the following disorders: major depressive disorder,

There is also empirical support for the association between cognitive distortions and a number of other maladaptive social and clinical conditions, including sexual assault (Baumeister, Catanese, & Wallace, 2002), pathological gambling (Steenbergh, Meyers, May, & Whelan, 2002), adolescent anxiety and depressive disorders (Kendall, Kortlander, & Brady, 1992), violence and anger in marital relationships (Ekhardt, Barbour, & Davison, 1998), and adolescent depression and anxiety (Kolko, Brent, Baugher, Bridge, Birmaher, 2000). To the extent that dysfunctional cognition and its corollaries contribute to these problems, there is hope—and evidence—for the effectiveness of CT in their amelioration.

Given the future trends in the evolution of psychological research, clinical practice, and CT, this ability to provide empirical validation for a promising new measure of cognitive dysfunction could provide further support for the cognitive model, provide clinicians with a valuable assessment instrument, and further advance the field. Moreover, identifying the extent to which cognitive distortions contribute to psychological dysfunction across Axis I and Axis II should add practical knowledge to aid professionals when assessing and treating these troubling disorders.
Identifying cognitive distortions in current clinical practice among cognitive therapists generally involves the use of the various thought records, such as the Dysfunctional Thoughts Record (Beck, et al., 1979), Thought Record (Persons, Davidson, & Thompkins, 2001), and Burns (1999) Daily Mood Log. Although these instruments may illuminate distorted cognition, they fail to identify specific cognitive distortions; instead, this task is left to the clinician. Moreover, even after completing various thought records, the process of identifying cognitive distortions is generally neither standardized nor quantitative (Yurica, 2002).

Results of randomized clinical trials supported the efficacy of such thought records for modifying dysfunctional thinking in depressed outpatients (Craighead, Craighead, & Ilardi, 1998; DeRubeis & Crits-Christoph, 1998). However, there are a number of impediments to using thought records. For instance, Persons et al., (2001) found that the following factors were impediments to proper application: (a) difficulty eliciting patients’ automatic thoughts, (b) patients’ reluctance to use the instruments both in and outside of treatment sessions, (c) noncompliance with homework assignments, (d) patients’ beliefs that the procedure would not be helpful.

In addition, it appears that clinicians use indirect and non-standardized methods for identifying specific types of cognitive distortions because the various assessment tools intended to assess dysfunctional thinking are neither widely known nor employed in the field and inadequately explain specific varieties of cognitive distortions independent of clinical diagnosis; some of these assessment tools include: the Dysfunctional Attitude Scale (DAS; Weissman &
Beck, 1978; Weissman, 1979), Cognitive Errors Questionnaire (CEQ; Lefebvre, 1981), and Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). In practice, this makes identifying, modifying, documenting, and predicting cognitive distortions problematic and unnecessarily time-consuming (Yurica, 2002).

Cognitive Distortions and Psychological Disorders:

Statement of the Problem

Although the cognitive model recognizes the fundamental role of cognitive distortion in the genesis and maintenance of all manner of psychological disturbance, only one recently validated measure exists that identifies the frequency and categorical use of cognitive distortions by mental health patients. Although promising, this instrument, the ICD, has been validated only for anxious and depressed populations. Moreover, a review of the literature revealed that the DAS was useful in distinguishing individuals with either Axis I or Axis II conditions from controls; however, there was no support for discriminant validity of the DAS in identifying specific PDs or Axis II Clusters, and there was little research into how individuals with specific Axis I and Axis II conditions differ in their tendency to engage in cognitive distortion (Ilardi & Craighead, 1999).

The overall purpose of the present study was twofold: First, the study sought to determine whether or not cognitive distortions correlated with the number and severity of psychological disorders across Axis I and Axis II. Second, the study intended to assess further the validity and reliability of a promising new self-report measure of cognitive distortions, the ICD and was to correlate this instrument with clinical diagnoses as determined by the MCMI-III.
A literature review revealed no research addressing the contribution of the frequency of both cognitive distortions in a heterogeneous adult outpatient sample meeting criteria for a wide range of DSM-IV disorders across both Axis I and Axis II. Most studies were limited to investigations of circumscribed diagnoses, such as depression or anxiety, with the possibility of another added variable, that is, comorbid PDs (e.g., Ilardi and Craighead, 1999). Moreover, no studies were found assessing the relative contribution of the frequency of cognitive distortions both to the number and the severity of disorders. This lacunae is problematic; because if, as cognitive theory and research have indicated, cognitive distortions contribute to psychological disorders, an additional understanding is needed of the many patients, especially those with PDs, who present with multiple diagnoses across both axes (Beck et al., 2004; Millon & Davis, 1996).

Consequently, providing further validation for the ICD, a brief, portable, and objective measurement of these key cognitive processes should be beneficial both to research and to practice in a number of important respects. First, cognitive therapists can provide convincing post-treatment evidence of successful treatment outcome by using the ICD to establish objective baselines and regularly monitor behavior and mood utilizing empirically valid and reliable instruments. Although such measures are helpful in diagnosis and treatment planning for a variety of disorders, there is a paucity of empirically supported measures designed to assess cognitive distortions directly—conceptualized as one of the fundamental cognitive dysfunctions—that have been validated for the a wide range of clinical diagnoses. Accurately identifying specific patterns of cognitive distortions early in the course of treatment might assist the clinician to target more efficiently dysfunctional thought patterns that maintain and exacerbate problems. Moreover, an instrument which can provide regular assessment of cognitive distortions throughout treatment can provide an objective measure of progress because
cognitive distortions have been shown to correlate with a number of Axis I disorders; for example, depression, (e.g., Beck, Ward, Mendelson, Mock, & Erdbaugh, 1961; Butler & Beck, 2000; Hollon & Kendall, 1980; Yurica, 2002) anxiety (Ross, Gottfredson, Christensen, & Weaver, 1986; Yurica, 2002) and PDs (Ilardi and Craighead, 1999).

Second, it has been shown that treatment occurring earlier in the course of psychological disorders correlates with a number of therapeutic benefits, including positive treatment outcome, fewer office visits to physicians, and reduced health care costs (Bruns, 1998; Kaplan, 2000). Thus, early identification of cognitive distortions might allow the therapist and patient to collaboratively and more quickly illuminate and modify the underlying secondary beliefs and schemas, which maintain those same cognitive distortions.

Third, the instrument could facilitate psychoeducational processes regarding patients’ particular patterns of cognitive distortions. If specific distorted thought patterns are noted, the therapist may teach more adaptive cognitive and behavioral skills explicitly targeting those distortions. For example, if the patient exhibits rigid patterns of perfectionism, it might be more efficient to use decentering or scaling techniques as a first line of treatment (Beck & Freeman, 1990).

Fourth, there may emerge characteristic patterns of distortions that delineate particular Axis I versus Axis II conditions. If the ICD supports this difference, its use may increase diagnostic accuracy, which, in turn, may lead to more effective treatment selection.

Fifth, demonstrating a correlation between the amelioration of cognitive distortions and the improvement of clinical symptoms for Axis I and Axis II conditions would lend further empirical support to the cognitive model of psychological disorders on both diagnostic axes.
Sixth, the ICD has already demonstrated efficacy in correlating the chronicity of cognitive distortions with depression and anxiety. If the same pattern emerges with PDs, the ICD will be able to provide researchers and clinicians with an elegant tool to gauge quickly and accurately the severity of pathology (Yurica, 2002). Furthermore, because the ICD directly assesses cognitive processes that are central to maladaptive functioning and treatment, ascertaining the severity of distortions may provide a roadmap to guide appropriate treatment planning by allowing the clinician to adapt to the patient’s level of cognitive functioning.

Seventh, this study also sought to expand further the utility of the ICD beyond the evaluation of anxiety and depression (Yurica, 2002) for use with additional Axis I and Axis II conditions. It is hoped, also, that a sufficiently validated ICD will allow for greater flexibility in empirical research by providing an additional assessment tool for the design and standardization of empirical procedure, which can be employed to measure pathology and progress, aiding as well in the replication of empirical research.

Finally, in a review of 136 research studies, Grove and Meehl (1996) determined that empirically based personality assessment instruments are consistently equal to or superior to less-structured clinical interview methods; these instruments increase the efficiency of the assessment process, understand patients more fully, establish rapport, formulate an accurate diagnosis, develop insight, plan optimum empirically guided treatment planning, and predict the course of treatment (Costa & McCrae, 1992). Consequently, a brief self-report measure, such as the ICD, administered early in the treatment process can efficiently increase diagnostic accuracy and improve treatment planning; this may facilitate these benefits for clinicians and patients alike. Such an instrument might also lessen the burden on the psychological and medical communities by reducing the course of treatment and, by extension, health care costs.
Stated more psychometrically, the goals of the study are to 1) evaluate the construct validity of the ICD in a sample of Axis I and Axis II patients, 2) determine the relationship between the ICD with specific Axis I and II disorders, 3) establish the relationship between the ICD and the MCMI—III, a well-established, multidimensional, valid and reliable measure of Axis I and Axis II conditions, 4) further confirm the internal consistency of ICD content by confirming the acceptable alpha coefficient levels originally found by Yurica (2002), and 5) provide an instrument that will assist clinicians to target specific maladaptive cognitive distortions regardless of diagnosis.

In summary, the purpose of this study is to further assess a promising instrument, the ICD, for the measurement of cognitive distortions, as defined by Beck (1976), Beck et al., (1979), Burns (1980, 1999), Freeman & Oster (1999), Gilson & Freeman, (1999), and Yurica (2002) as these occur in various psychological disorders. It is hoped that this instrument will aid in cognitive-behavioral treatment for adult clinical populations.

The subsequent literature review offers an empirical and theoretical basis for the further validation of the ICD, as supported by relevant literature regarding 1) the original model of cognitive therapy. 2) contemporary models of cognitive therapy 3) contemporary models of cognitive behavior therapy 4) varieties of cognitive distortions 5) cognitive processing models of cognitive distortions 6) evolutionary models of cognitive distortions 7) developmental theories cognition and cognitive distortions, 8) efficacy of cognitive therapy 9) outcome and measures and 10) limitations of existing measures of cognitive distortion.
Beck’s Original Model of Cognitive Therapy

Beck (1976; Beck et al. 1979) originally posited the theory that one’s affect and behavior are powerfully influenced by one’s cognition, including one’s past, present, and future interpretations of oneself, the world, and one’s future. Perception and experience were believed to be active processes based on the interpretation of both internal and external stimuli. Further, individuals were said to manifest certain trait-like cognitive patterns that left them vulnerable to emotional distress (Beck, 1976; Beck et al., 1979). These cognitions did not necessarily correspond to reality but were thought to be “based on attitudes or assumptions (schema), developed from previous experiences.” (Beck et al., 1979, p.3). In other words, cognition may be corresponding to previous experience rather than extant reality and may, therefore, be distorted.

Consequently, CT is founded on the premise that individuals can learn to recognize and correct their distorted thinking and that more realistic thinking can result in amelioration of clinical symptoms.

Consistent with the cognitive model of psychopathology, CT is designed to be structured, directive, active, and time-limited, with the express purpose of identifying, reality-testing, and

Although modern CT employs interventions, which may be cognitive, behavioral, interpersonal, or imaginal, (e.g., Beck, 1996; McMullin, 2000), the ultimate goal is to disconfirm maladaptive beliefs and to correct cognitive distortions (Beck et al., 1979). Assumptions underlying CT include the following:

1. Perception and experience are active processes involving both inspection and introspection.
2. Cognitions represent a synthesis of internal and external stimuli.
3. The way one views an event is evident in one’s cognitions (thoughts and visual images).
4. Cognitions—reflecting on oneself, on one’s past and future, and on other people—constitute one’s stream of consciousness or phenomenological field.
5. Modifications in cognition will alter affect, mood, and behavior.
6. Psychotherapy allows the patient to become aware of cognitive distortions.
7. Correcting these dysfunctional cognitions can lead to amelioration of clinical disorders.

**Contemporary Models of Cognitive Therapy**

There are a several competing theoretical models within the field of CT today. Despite their differences, there are a number of common assumptions among cognitively oriented therapists which still unite the field. For example, modern cognitively oriented therapists respect the patient’s subjective experience. In addition, cognitively oriented therapy is active, directive, empirical, and behavioral. Cognitive models generally draw on Beck's general schema theory and the notion of automatic thoughts (Beck, 1976; Beck et al., 1979). This theory holds that core
beliefs and the content of schema are responsible for a myriad of cognitive, emotional, and behavioral interactions—some of which may be dysfunctional. The maladaptive cognitive processes, which may cause symptoms that arise to the level of clinical significance, include cognitive distortions and maladaptive assumptions, rules, and other secondary beliefs (Alford & Beck, 1997; Beck, 1996; Beck & Freeman, 1990; Beck et al., 2004). Additionally, psychological disorders may be maintained by schema-driven processes, particularly schema-related avoidance and maladaptive compensatory strategies (Young, 1990/1999). To complicate matters, conflicting and interacting beliefs and unhelpful coping strategies are involved in maintaining certain disorders (Wells, 1997). In other words, the patients’ subjective perceptions are the central focus of CT.

CT requires an active approach, with the therapist and patient collaboratively defining problems, identifying goals, and negotiating the tactics and strategies to achieve those goals (Beck et al, 1979, J. Beck, 1996; Freeman & Oster, 1979). Patients’ active collaboration is essential for identifying, exploring, and modifying distorted cognitions and maladaptive behavior.

Another salient characteristic of modern CT is the wide use of behavioral interventions. However, as opposed to conditioning models, CT theorists attribute resulting change in emotion and behavior to change in “verbal behavior” (Alford & Beck, 1997, p.60). In other words, the cognitive model asserts that the ultimate goal of even the most behavioral interventions is reducing distorted cognition and increasing rational thinking. It is then essential to generalize these changes to important areas of the patient’s life (Beck et al, 1979; Freeman & Oster, 1999).

To facilitate the generalization, patients are oriented to the cognitive model and encouraged to engage actively in between-session homework assignments (Beck et al., 1979; Freeman &
Rosenfield, 2002). Contemporary CT models are empirical. For instance, both intrasession CT and intersession homework allow patients to test and to modify, empirically, the idiosyncratic beliefs that maintain various clinical disorders on both Axis I and Axis II (Ilardi & Craighead, 1999; Alford & Beck, 1997, Beck & Freeman, 1990; Beck et al., 2004; Freeman & Rosenfield, 2002). Homework activities may include, but are not limited, to activity scheduling, completing thought records, self-monitoring, breathing retraining, graded task performance, mastery and pleasure tasks, social skill building, and relaxation.

The original cognitive model has evolved as Alford and Beck (1997) synthesized the subsequent two decades of research into their modified cognitive theory to include 10 “formal axioms” (p. 15). First, schemas are conceptualized as meaning-making structures, through which, individuals interpret given contexts in relation to the self.

Second, assigning meaning controls behavior, emotion, attention, and memory. Meaning assignment can occur both at the automatic and deliberative levels. Third, there is a reciprocal influence between cognition, affect and behavior. Four, “cognitive content specificity” (p. 16) occurs when meaning is translated into particular patterns of attention, memory, emotion, and behavior.

The fifth axiom, which is particularly germane, states that because meaning is constructed by the individual, it may be incorrect in relation to specific contexts and goals. The authors state, “When cognitive distortion or bias occurs, meanings are dysfunctional or maladaptive” (p. 16). Cognitive distortions may include errors in interpretation and cognitive processing, or both. Six, individuals are predisposed to particular cognitive distortions, leaving them predisposed to specific syndromes. This is termed cognitive vulnerabilities. Seven, psychopathology is said to result from cognitive distortions related to a slightly modified cognitive triad, reflecting
maladaptive interpretations “regarding the self, the environmental context (experience), and the future (goals)” (p.16). Eight, events are interpreted on two levels: The Public or objective level and a private level. The latter incorporates generalizations, implications, and significance. Nine, “Three Cognitive Systems” provide for three levels of cognition, including (a) the automatic level (unintentional/preconscious), (b) the conscious level, and (c) the realistic, adaptive, rational, or metacognitive level. Changes occurring at the conscious level primarily account for progress in CT.

Finally, the tenth axiom posits the idea that individuals’ schemas have evolved to assist them to adapt to their environments. Schemas become maladaptive only when they are out of context with the general social or physical environment.

In summary, Alford & Beck (1997) asserted that cognitive distortions arise from “patterns” and “predispositions”, indicating that this maladaptive pattern of thinking may be trait-like rather than state-like. This is a theory that has received some support, particularly with Axis II patients. For example, Ilardi & Craighead, (1999) found that Axis II patients’ distortions, as measured by the DAS, seemed to persist beyond amelioration of Axis I syndromes. However, in individuals with only Axis I diagnoses, cognitive distortions receded as depressive symptoms remitted. Thus, the tendency to engage in cognitive distortion was more trait-like in individuals with Axis II disorders, whereas this propensity was more state-like in those with Axis I conditions. Once again, theory indicates that cognitive distortions play a pivotal role in the genesis, maintenance, and eventual amelioration of psychological disorders.
Contemporary Models of Cognitive Behavior Therapy

CT has always included cognitive and behavioral interventions in its repertoire (Beck et al. 1979; Ellis, 1962). In, perhaps, one of the most comprehensive reviews of cognitive-behavior therapy (CBT), Brewin (1996) contended that CBT had evolved to a point at which it encompassed diverse sets of theories, terms, and procedures. Historically, Brewin asserted that the cognitive and behavioral camps suffered from an “absence of an explicit role for conditioning in cognitive therapies and the absence of a role for verbal mediation in behavior therapies (p. 34)”; this led to a period of estrangement and disparagement between the two factions.

Today, various CBT schools are distinguished by their targeting of circumscribed disorders or by targeting various generalized disorders. Additionally, some CBT theorists suggest that interventions should be aimed at modifying conscious beliefs and representations rather than modifying unconscious representations in memory. Interventions aimed at altering consciously accessible beliefs subscribe to the theoretical notion of appraisal theories of emotion and cognitive theories of emotion and motivation. Interventions aimed at modifying unconscious representations are related to their theoretical bases in learning theory and in findings from experimental cognitive psychology (e.g. Chambless & Gillis 1993, Dobson 1989, Hollon, Shelton, & Davis, 1993). Regardless of theoretical underpinning, CBT is focused on cognitive change, behavioral change, or both.

A comprehensive review of the literature (DeRubeis & Crits-Cristoph, 1997), indicated differential results for interventions that were principally cognitive versus those that were predominantly behavioral. For instance, predominantly behavioral interventions have demonstrated good outcome with certain Axis I conditions, such as specific phobias, social
phobia, panic disorder, PTSD and agoraphobia. On the other hand, both PDs and depressive disorders responded better to predominantly cognitive interventions. Leichsenring & Leibing (2003) also demonstrated efficacy for CBT in treating PDs. Other studies have found that both cognitive and behavioral interventions were effective (DeRubeis & Crits-Cristoph, 1997; Rachman, 1999).

These facts indicate that there are cognitive and behavioral components both in Axis I and Axis II disorders which can be ameliorated through either predominantly cognitive or mainly behavioral means. However, one cannot discount the fundamental role of cognitive change resulting from even the most behavioral interventions. Although both modern CT and CBT approaches employ interventions which may be cognitive, behavioral, interpersonal, or imaginal (e.g., McMullin, 2000), the ultimate theoretical goals are to disconfirm maladaptive beliefs and to correct cognitive distortions (Beck et al., 1979; Butler & Beck, 1998). Consequently, it would be beneficial both for CT and CBT practitioners to be able to assess these cognitive components, which are pivotal correlates of treatment success; this is possible with valid, reliable instruments for the myriad of disorders and comorbidities with which they are confronted. A literature review related to cognitive distortions is considered next.

Varieties of Cognitive Distortions

The term cognitive distortion first appeared in the literature in Beck’s (1967) discussion of depression. At that time, Beck theorized that his patients frequently engaged in cognitive processing patterns that were systematic but erroneous. He recognized that such faulty information processing predictably produced maladaptive emotion and behavior.
Cogntive Distortions: Origins of Terms

A number of leading CT and CBT theorists have proposed a variety of cognitive distortions. Beck (1967) originally postulated six varieties of distortion, including the following: (1) absolutistic/dichotomous thinking, (2) arbitrary inference (3) minimization and magnification, (4) overgeneralization, (5) personalization, (6) selective abstraction.

In an effort to make Beck’s concepts even more comprehensible to the average patient, and borrowing from Ellis & Grieger (1986), Burns (1990, 1999) offered 10 cognitive distortions, including: (1) all-or-nothing thinking (2) discounting the positive, (3) emotional reasoning, (4) jumping to conclusions, (5) labeling, (6) magnification, (7) mental filter, (8) overgeneralization, (9) blaming and personalization, (10) should-statements.

Additional cognitive distortions added important interpersonal and subjective dimensions, such as (1) comparison, (2) externalization of self-worth, and (3) perfectionism (Freeman & DeWolf, 1990; Freeman & DeWolf, 1992; Freeman & Oster, 1999).

Later, Gilson & Freeman (1999) suggested that, in addition to distorted cognitive processing, individuals often engage in fallacious thinking, such as: (1) fallacy of change, (2) fallacy of worrying, (3) fallacy of fairness, (4) fallacy of ignoring, (5) fallacy of being right, (6) fallacy of attachment, (7) fallacy of control, and (8) heaven’s reward fallacy.

Other investigators have suggested disorder-specific cognitive distortions that may manifest in particular disorders. For example, in pathological gamblers: reframed losses and the illusion of control over luck, (Toneatto, 1999); in incarcerated teenagers: self-serving and self-debasing distortions (Barriga, Landau, Stinson, Liau, & Gibbs, 2000), and in PTSD patients:
preoccupation with danger and self-blame (Briere, 2001; Briere, Runtz, Giancola, Mezzich, Clark, & Tarter, 1993).

Najavits (1993; Najavits, Gotthardt, Epstein, 2004) proposed a series of distortions specifically related to substance use disorders, including, but not limited to: (1) The escape: Inability to tolerate feelings or solve problems. The only escape appears to be drugs, self-cutting, sleep, food, etc. (2) Dangerous permission: Patients give themselves permission for self-destructive behavior. (3) Time warp: It feels as if negative feelings will go on forever. (4) Short-term thinking: Focus on the short-term only, how one feels for a few minutes. (5) The good old days: Remembering only the wonderful highs from a drug or an abusive relationship.

A survey of the above catalog of cognitive distortions, though not complete, illustrates the fact that these processing errors may affect virtually every aspect of individuals’ lives. The following review of cognitive processing models more fully illustrates the cognitive mechanisms involved in these maladaptive thought patterns.

Cognitive Processing Models of Cognitive Distortions

The concept of cognitive distortions has enjoyed widespread acceptance in clinical practice and considerable validation in empirical research (e.g., Najavits et al., 2004; McGrath & Repetti, 2002; Yurica, 2002). Kelly’s Personal Construct Theory (1955) proposed that people develop anticipatory cognitive attitudes that result from past experience. A portion of this cognitive organization revolves around schemas, which Kelly theorized were mental organizations of information developed from past experience that are used to categorize new events. Schemas facilitate encoding new events, orienting individuals to novel events, suggesting
where to look for more information, and providing default information to fill gaps in perception and interpretation. These constructs direct, filter, encode, and evaluate new experience. In addition, schema can influence memory, both proactive and retroactive. For instance, beliefs, such as “others cannot be trusted” may lead to expectations and misinterpretation of events in ways that are congruent with that belief. Additionally, language and the particular labeling of events can also transform experience, so that a man with “shifty eyes” will be experienced in a way that may be much different from perceiving that same man to be “cautious, observant, or thoughtful” (Andersson, 1994; Chiu, Krauss, & Lau, Whorf, 1956). Beck (1963, p. 120) recognized that one of the deleterious effects of “inexact labeling” was that it contributed to distortion. Consequently, expectations and language can distort appraisals of objective reality.

There are a number of extant cognitive processing models (see Ingram, Miranda & Segal, 1998 for a review), which at the most fundamental level, attempt to explain how individuals process information and perform cognitive tasks that affect all aspects of behavior and emotion. However, Kendall’s cognitive taxonomy model is the most relevant to the present research (Ingram & Kendall, 1986; Kendall, 1992). Kendall theorized that human cognition consisted of the following four fundamental elements:

1. Cognitive products or content: Thoughts, beliefs, and images. Self-referent speech composed of stored and organized memories.


3. Cognitive structures. Mental templates that attend to or filter certain stimuli.


Kendall (1985, 1992) further delineated faulty cognitive processing into active, cognitive distortion rather than cognitive deficiencies; the latter is postulated as the result from deficits in
cognitive functioning. According to the model, dysfunctional cognition is the predictable byproduct of maladaptive cognitive processing, manifested as cognitive distortions. However, according to Yurica (2002) it is also possible that the failure to think more actively or mindfully (Teasdale, Segal, Williams, Ridgeway, Soulsby, & Lau, 2000) distorts one’s experience.

Social and cognitive psychologists alike have observed that cognition occurs on two levels, one deep and effortful, and the other automatic and superficial (Chaiken & Trope, 1999; Petty & Cacioppo, 1984; 1986). When individuals engage in more superficial thinking, they are more liable to make errors in judgment based on emotion or on salient, but not necessarily important aspect of the situation.

Consistent with this theory, there is increasing evidence that humans have at least two partially independent ways of reaching decisions about important (often social) events. The first uses an experiential system, employs heuristics, takes mental short cuts to reach judgments quickly, resorts to emotional reasoning, is automatic, seems to rely more on conditioning, and is congruent with early childhood schemas (Chaiken & Trope, 1999; Gilbert, 1998; Petty & Cacioppo, 1984).

The second mode of cognitive processing involves a volitional, rational system, which operates more slowly as it integrates stored information from memory and knowledge. This system has the ability to incorporate logical deductive and abstract forms of reasoning in a more conscious way and without undue influence of past experience and conditioning (Chaiken & Trope, 1999; Power & Brewin, 1991; Gilbert, 1998; Petty & Cacioppo, 1984).

Investigators have determined that it is possible to reduce superficial processing by increasing the perception of personal relevance (Petty & Caciappo, 1984) and allowing more time for deliberation (Ratneswar & Chaiken, 1991). For example, students are more likely to
reduce rational decision-making strategies regarding the time needed to study for an upcoming exam when they believe that will be exempt. Most relevant to the cognitive model of psychotherapy, personal experience fosters cognitive processes, cognitive structures, and cognitive products that confirm expectancies whether those expectations are rational or are distorted. This complicated cognitive interaction is consistent with the notion of cognitive or confirmatory bias (Beck et al., 1979). In CT, patients learn to identify instances of heuristic, distorted thinking and then they are encouraged to engage actively in more rational, mindful thinking (e.g., Teasdale, Moore, Hayhurst, Pope, Williams, Segal, 2002).

Interestingly, it is also possible that cognitive distortions can be beneficial and, conversely, that promoting more accurate thinking may produce distress. In other words, there are instances when cognitive distortions may be adaptive and that accurate thinking may correlate with maladaptive behavior and distress. For example, it was determined that although depressed patients engaged in more negative cognition than nondepressed individuals, the depressed patients were actually more accurate in their thinking (Alloy & Abramson, 1988). Support for this depressive realism was also demonstrated in more accurate thinking among depressed breast cancer patients, as compared with their nondepressed counterparts; this type of realism motivated the depressed individuals to treatment adherence (Keller, Lipkus, & Rimer, 2002). Opponents of this theory caution that the phenomenon has been demonstrated in severely limited settings and suffers from lack of empirically derived criteria for the term accuracy (e.g., Pacini, Muir, & Epstein, 1998; Vazquez, 1987).

In addition, comparing oneself favorably with those perceived to be less fortunate, that is, downward social comparison (Wood, Taylor, & Lichtman, 1985), increased self-esteem and reduced stress among breast cancer patients. Similarly, the mere perception of control allowed
enhanced performance, inspired confidence, and produced higher self-esteem (Tafarodi, Milne, & Smith, 1999).

Thus, the research is not without controversy regarding the costs and benefits of distorted thinking. However, there is little debate that cognitive distortions are complex phenomena that occur outside of conscious awareness and correlate with a host of psychological disorders, dysfunctional behavior, and emotional problems.

Evolutionary Models of Cognitive Distortions

In seeking to gain a deeper understanding of personality, Millon (1990) believed that it was necessary to explore the common elements of nature and science beyond the unnecessarily restrictive realm of human psychology. Evolution, Millon postulated, was the fundamental process that explained and unified nature, the sciences, and, more specifically, emotion, behavior, and cognition. Personality and PDs could be explained as attempts at adaptation and as a product of phylogenetic (specific to genus or group) as well as ontogenetic (specific to the individual) evolutionary progression.

Millon (1990; Millon et al, 1996) further asserted that personality was the individual’s distinctive attempt at adapting to a given environment. PDs were the result of maladaptive and deficient functioning. Such dysfunction was said to occur because of “protective constriction” (akin to repression and avoidance) and cognitive distortion that restricted prospects for new learning, misconstrued essentially benign events, and provoked undesirable reactions from others; these problems foster a self-defeating vicious cycle of personal problems and new
interpersonal predicaments that further magnify distress and drive people further away from an unbiased appraisal of reality (Millon et al, 1996, p. 15).

Gilbert (1998) viewed cognitive distortions as an evolutionarily adaptive response to the perception of threat, rather than mere maladaptive thinking. Gilbert posited the idea that “humans beings evolved to think adaptively, not rationally” (p. 448). Consistent with the previously cited cognitive psychological research, Gilbert also asserted that negative thinking, even when rational, might be dysfunctional at times.

For example, because the environment bombards people with so much data that it is impossible to perceive, attend to, analyze, interpret and draw conclusions about every aspect of all stimuli, humans are necessarily forced to make heuristic judgments about many events (Kahneman & Tversky, 1972). This is especially true in the face of emergency situations—or even the mere perception of threat—when there is little time to cogitate. For example, natural selection might favor an individual who responds to a surprise encounter with a shadowy figure in a darkened alley with the heuristic judgment of threat and a subsequent fight or flight response; it might, therefore, favor another individual less who attempts logical discourse and careful analysis during such an event (Cosmides, 1989). In this case, distorted thinking in the form of a threat bias might prove to be adaptive. Thus, there are advantages to acting quickly and in favor of a threat bias.

There is also evidence that moderate positive cognitive bias is a variety of cognitive distortion that may be adaptive. For example, Krebs and Denton (1997) determined that when individuals operate in groups, self-serving attributions, overestimation of personal abilities, illusion of control, and increased risk-taking behavior correlated with greater self-esteem, improved affect, and more adaptive behavior. Gilbert (1998) offered the following evolutionary
explanation and some empirical support for seven cognitive distortions that are frequently cited in the literature:

1. Selective Abstraction. Beck et al. (1979) referred to a tendency to focus on negative details out of context. Gilbert hypothesized that this tendency resulted from attentional biases. There is now much evidence that mood states do affect attentional mechanisms on tasks such as the Stroop Test (Williams, Mathews, & MacLeod, 1996) and that attentional biases and processing can occur without conscious awareness (Power & Brewin, 1991) and that the perception, for example, of threat can be adaptive.

2. Arbitrary Inference/Jumping to Conclusions (Beck et al., 1979). Emergency situations require categorical thinking when determining whether or not an event poses a threat. Decision-making is much more rapid when the number of possible choices is reduced, for instance, to threat or no threat (Epstein, Lipson, Holstein, & Huh, 1992). The principle of “better safe than sorry” when dealing with threat will likely result in jumping to conclusions and, according to Gilbert (1997; 1998) is the most salient cognitive distortion.

3. Dichotomous/All-or-Nothing Thinking (Beck et al., 1979). Similar to jumping to conclusions, dichotomous thinking illustrates rapid categorical thinking. Once the brain perceives threat, it will resort to more categorical processing to reduce response time and risk, which will result in action that may reduce the threat (Epstein et al., 1994; Gilbert, 1998).

4. Emotional Reasoning (Burns, 1990). According to Gilbert (1998, p. 457), “… for millions of years animals and humans have relied on fast track affect (emotional reasoning) to make decisions about actions when under threat.” Once again, this is fast track thinking
that may increase genetic fitness in life and death situations by increasing the probability of erring on the side of safety (Nesse, 1998).

5. Disqualifying the Positives (Burns, 1990). Downplaying one’s own attributes, as manifested in the form of modesty, is appropriate and even admired in certain contexts, cultures, and in moderation (Gilbert, 1998). Numerous studies support the hypothesis that modest people are better liked than those who boast (Baumeister & Jones, 1978; Rosen, Cochran, & Musser, 1990; Wosinka, Dabul, Whetston-Dion, & Cialdini, 1996). Of course, being liked enhances one’s attractiveness and increases opportunities to mate and pass on those modest traits (Langlois, & Musselman, 1995).

6. Social Comparison (Festinger, 1954). Both upward and downward social comparison can enhance self-esteem, boost confidence, reduce stress, and encourage perseverance on difficult tasks (Gibbons & Gerrard, 1989; 1991; Gilbert, 1998). It has long been recognized that people compare themselves socially with others because it would be adaptive to identify who is one’s superior or inferior before determining the most advantageous way to interact with him or her. Comparison occurs even when this makes one unhappy or depressed. Gilbert, (1998) posited the theory that social comparison is probably one of the oldest forms of social cognition.

7. Personalization and Blame (Beck et al., 1979). Attributions of self-blame may be adaptive in a number of ways. First, it may offer some illusion of control, because negative events that are perceived to result from one’s own negligence should be controllable. Second, blaming oneself avoids attacks on others as well as the resultant retaliation. As Gilbert (1998) suggested, “Even if not expressed, the desire to counter-attack when blaming others (non-submissive attitude) could be detected by the other and escalate the conflict” (p. 450). In
support of the adaptive nature of personalization of blame, Andrews & Brewin (1990), found that abused women blamed themselves more for abuse while still in the abusive relationship, but blamed their partners more after separation; that is, when the women were removed to a safe distance, the risk of counter-attacks from the partners were reduced. Self-blame may also elicit secondary reinforcement in the form of social support (Driscoll, 1988).

Gilbert (1998) concluded that evolutionary explanations for cognitive distortions have implications for CT. For example, framing such distortions as the product of normal adaptations that, with treatment may be modulated, normalizes the patient’s responses, provides insight, and increases mindfulness. Although these seemingly automatic cognitive mechanisms may have been adaptive throughout our evolutionary history, they can, however, cause immense problems today, in creating, maintaining, and exacerbating psychopathology. The question remains, how do cognitive distortions arise on the ontogenetic level?

**Developmental Theories, Cognition, and Cognitive Distortions**

Yurica (2002) considered many of the following developmental theories when formulating the ICD. Head and Holmes (1911) were among the first to use the term schema. These investigators were interested in patients’ spatial assessment of their own bodies, referring to their perceptions as the postural schema. Later, Piaget (1952) conceptualized the idea that the human mind organized schema as internalized regularities (operations) into dynamic cognitive structures, which he termed schema. Schema represented the relationships between perceived environmental regularities, or concepts. With experience, humans develop associations and
perceive relationships among concepts and develop a rich variety of schema, which encompass virtually every aspect of life.

Erikson (1963) proposed that schema or unconditional core beliefs develop when individuals are infants and that children progress through four critical psychosocial stages of development, occurring at circumscribed junctures from infancy through puberty. Layden, Newman, Freeman, & Morse, (1993) produced a seminal work on the development of borderline personality disorder patients by integrating Erikson and Piaget’s theories into a cognitive framework. Synthesizing Erikson’s theory into a cognitive model of schema development, Layden et al. (1993) suggested that failure at specific Eriksonian stages predisposes individuals to acquiring maladaptive schemas. Success or failure at each of these stages results in the following, respective outcomes:

Stage 1: Ages birth to 18 months. Trust versus mistrust. Mistrust and abandonment schemas develop in response to failure to develop loving and trusting relationships

Stage 2: Ages: 18 months to 3 years. Autonomy versus shame and doubt. Failure to develop physical control, such as in walking, grasping, and rectal-sphincter response may result in schemas regarding competence which are related to shame and doubts.

Stage 3: Ages 3 to 6 years. Initiative versus guilt: Failure to take initiative or being unusually assertive may lead to schemas related to dependence and emotional deprivation

Stage 4: Ages 6 to 12 years. Industry versus inferiority: Inability to deal with the growing demands associated with new skills may lead to schemas of incompetence. Additional negative schemas of unlovability and defectiveness may result at any stage (Layden et al., 1993).

Although infants begin with scant cognitive processing skills, these abilities, along with reasoning, and problem-solving skills develop as infants interact with their new social and
physical environment (Piaget, 1952). As skills develop at certain phases of development, so too may inaccurate thinking patterns or cognitive distortions (Layden et al., 1993). Layden et al. further posited that cognitive distortions may also develop at discrete stages of cognitive development as proposed by Piaget (1952), as follows:

Stage 1: Ages birth to 2 years. The Sensory Motor Stage. Consistent with Piaget’s notion of egocentrism and a lack of object permanence occurring at this phase, Layden et al. (1993) propose that the cognitive distortion of mind reading, in addition to entitlement and lack of empathy develop in BPD patients at this stage.

Stage 2: Ages 2 to 7 years. The Preoperational Stage. During this stage, children think concretely but are unable to engage in abstract logic. However, many cognitive distortions may develop at this stage. For instance, when decentration or the ability to see the whole in relationship to the parts, fails to develop adequately, Layden et al. (1993) proffer the idea that the cognitive distortion of overgeneralization can result as individuals categorize similar objects on the basis of only one or of unimportant characteristics. Additionally, the cognitive distortions of emotional reasoning, dichotomous thinking, catastrophization, and perfectionism are thought to develop during this phase.

Stage 3: Ages 7 to 11 years. The Concrete Operations Stage. With the accumulation of physical experience, the children begin to conceptualize, creating logical structures to explain physical experiences. This plants the seed for abstract reasoning, such as in arithmetic equations.

Stage 4: Ages 11 to 15 years of age. The child becomes capable of abstract thought, and metacognition—the capacity to think about thinking—allowing them to see wide varieties of possible solutions for increasingly complex problems.
Layden et al. (1993) asserted that individuals with BPD exhibit a lack of cognitive development during Stages three and four. This produces deficits in metacognition, theory building, generation of alternatives, imaginal hypothesis testing, and a lack of deductive and inductive reasoning skills; these may, in turn, distort reality, prevent adaptive functioning, and produce immense interpersonal difficulties.

To summarize, the synthesis of the cognitive model with the Erikson’s and Piaget’s developmental theories provides a cogent explanation for the generation of maladaptive schemas and cognitive distortions. Moreover, the deficits in cognitive adaptation from these earlier stages of cognitive development are quite appropriate for reciprocal CT techniques intended to reduce the distortions, including “… teaching patients alternative ways of thinking (e.g., examining the evidence, weighing the evidence, generating alternative explanations, imagining hypothetical scenarios” and self-monitoring (Yurica, 2002, p. 37).

The above models, cognitive processing, evolutionary, and developmental, provide elegant and convincing evidence for the genesis, maintenance, process, and amelioration of cognitive distortions. The following is an explication of how these maladaptive thought patterns are expressed in psychological disorders across Axis I and Axis II; an explanation of treatment procedures is also included.
The Efficacy of Cognitive Therapy

CT is based on the principle that human emotion and behavior are heavily influenced by cognition. Thus, consistent with cognitive theory, personality and clinical pathology correlate with cognitive distortion (e.g., Beck, 1976; Beck & Freeman, 1990; Beck et al., 2004; Yurica, 2002).

In research and practice, CT enjoys considerable empirical support for its efficacy in treating many frequently occurring disorders, not only in a broad array of populations, but also in all formats, such as individual, couples, group and family, and in both inpatient and outpatient populations (Beck, 1993). Butler and J. Beck (2000) evaluated 14 meta-analyses, examining the efficacy of CT in 325 studies with a total of 9,138 participants. Meta-analysis is a statistical strategy that permits researchers to aggregate the results of several studies and to translate them into standard units known as an effect sizes. In their review, these investigators examined how CT outcomes compared with the outcomes of various control groups in terms of their effect sizes, including the percentage of those participants’ responses that was superior to a variety of no-treatment controls. Table 1 clearly illustrates the efficacy of CT for a host of Axis I conditions.
Table 1

Summary of meta-analytic findings: Cognitive therapy vs. no-treatment, wait list, and placebo controls (Butler & Beck, 2000).

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Average effect size</th>
<th>% of CT patients superior to controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult unipolar depression</td>
<td>.82</td>
<td>79%</td>
</tr>
<tr>
<td>Adolescent unipolar depression</td>
<td>1.11</td>
<td>87%</td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>1.04</td>
<td>85%</td>
</tr>
<tr>
<td>Panic disorder with or without agoraphobia</td>
<td>.91</td>
<td>82%</td>
</tr>
<tr>
<td>Social phobia</td>
<td>.93</td>
<td>82%</td>
</tr>
<tr>
<td>Childhood depression and anxiety disorders</td>
<td>.90</td>
<td>82%</td>
</tr>
<tr>
<td>Marital distress</td>
<td>.71</td>
<td>76%</td>
</tr>
<tr>
<td>Anger</td>
<td>.70</td>
<td>76%</td>
</tr>
<tr>
<td>Childhood somatic disorders</td>
<td>.47</td>
<td>68%</td>
</tr>
<tr>
<td>Chronic pain (not headache)</td>
<td>.46</td>
<td>68%</td>
</tr>
</tbody>
</table>

Note. Empirical evidence for the efficacy of CT over controls in magnitude of effect and percentage of superior response. Reprinted with the permission of Judith Beck. Source: http://www.beckinstitute.org/beck.html
Cognitive Therapy for Depression

The efficacy of CT for depression is now widely accepted. Empirical studies have demonstrated the relationship between positive CT outcome and cognition. For example, Oei and Sullivan (1999) found that participants who had recovered from depression, operationalized as BDI scores below 10, engaged in less frequent negative automatic thoughts and reported higher activity levels than their non-recovered counterparts.

In their comprehensive meta-analysis, Butler and Beck (2000) demonstrated the fact that 79% of adult unipolar patients responded to CT for depression with an average effect size of .82. Even better results were found for adolescents, with 87% responding and an average effect size of 1.11. This meta-analysis also determined that CT was superior to antidepressant medication with an average effect size of .38 for adult unipolar depression. Perhaps the greatest benefit that CT offered as being superior to medication alone was the fact that CT patients experienced less than half the relapse rate of medicated patients at one-year follow up, 30% vs. 60%, respectively. Additional mounting evidence also suggests that CT reduces relapse and recurrence of depressive episodes. For example, a number of studies found that outpatients who recovered from major depression following CT experienced less subsequent relapse or perceived need for treatment than patients who recovered using pharmacotherapy; they are subsequently withdrawn from antidepressant medication (Blackburn, Eunson, & Bishop, 1986; Evans, Hollon, DeRubeis, Piasecki, Grove, Garvey et al, 1992; Shea, Elkin, Imber, Sotsky, Watkins, Collins, et al., 1992; Simons, Murphy, Levine, & Wetzel, 1986). The utilization of CT following recovery with
pharmacotherapy also reduced subsequent relapse and recurrence of depression (Fava, Grandi, Zielezny, Rafanelli, Canestrari, 1996; Fava, Rafanelli, Grandi, Conti, & Belluardo, 1998). Even for patients responding only partially to antidepressant medication, the addition of CT to clinical management and continuing antidepressant medication significantly reduced rates of relapse (Paykel, Scott, Teasdale, Garland, Moore, Jenaway et al., 1999).

Additional evidence also suggests that CT reduces relapse and recurrence of depressive episodes. For example, outpatients who recovered from major depression following CT experienced less subsequent relapse or perceived need for treatment than patients who recovered using pharmacotherapy and then were subsequently withdrawn from antidepressant medication (Blackburn, et al., 1986; Evans, Hollon, DeRubeis, Piasecki, Grove, Garvey, & Tuason, 1992; Shea, Elkin, Imber, Sotsky, Watkins, Collins et al, 1992; Simons, Murphy, Levine, & Wetzel, 1986). CT following recovery from pharmacotherapy also reduced subsequent relapse and recurrence of depression (Fava, Grandi, Zielezny, Rafanelli, & Canestrari, 1996; Fava, Rafanelli, Grandi, Conti, & Belluardo, 1998).

In a controlled clinical trial, Teasdale, Moore, Hayhurst, Pope, Williams, Segal (2002) determined that the prevention of relapse from depression was mediated through changes in an all-or-none, absolutistic thinking style, operationalized as an extreme dichotomous negative or positive response set to a number of self-report instruments; these included the Attributional Style Questionnaire (Peterson et al., 1982), Dysfunctional Attitude Scale (Weissman & Beck, 1978), and the Beck Depression Inventory (Beck et al., 1979). Dichotomous distortions were inferred when questions received responses similar to the following: Causes of negative outcomes "will never again be present." Interestingly, such extreme responding has been determined as a marker of rapid, seemingly automatic processing, which is also consistent with
negative correlations between attitude extremity and response latency, as previously reported (e.g., Bargh et al., 1992). Teasedale (et al., 2002) affirmed the pivotal role of such automatic cognitive distortions as predicted by the cognitive model of depression. Also supported was the hypothesis that relapse into depression was correlated with the sum total of dichotomous cognitive distortions.

**Depression Complicated by Personality Disorders**

Millon, Davis, & Millon (1997) conceptualize Axis I clinical symptoms as “extensions or distortions of the patient’s basic personality pattern... waxing and waning over time depending on the impact of stressful situations.” (p. 22). The multiaxial model posits an interaction between Axis I and Axis II symptomatology in which personality is defined as the “…overall capacity to perceive and to cope with our psychosocial world…” (Millon et al., 1997, p.120). Personality is further conceptualized as analogous to an immune system, protecting the individual from the vicissitudes of external stressors. However, Axis I symptoms may occur because the PD patient’s dysfunctional “immune systems” fails to protect the individual from stress. When this occurs, Axis I clinical syndromes occur in addition to the preexisting PD symptoms. This increases the total severity of the individual’s dysfunction (Millon et al., 1997). In other words, all other things being equal, an individual who meets the diagnostic criteria for both major depressive disorder and dependent personality disorder would be expected to evince more impairment and/or distress than another person with a diagnosis on either Axis I or Axis II.

According to Hirschfeld and Shea’s (1992) vulnerability model, like a compromised immune system which fails to insulate one from disease, the distorted cognition associated with
PD’s may leave one vulnerable to the stressors that are noted on Axis IV. As Millon et al. (1997, p. 124) assert:

Faced with recurrent failures, anxious about old and unresolved conflicts reemerging, and unable to recruit new adaptive strategies, they (the personality disordered) may revert to pathological ways of coping, to less adequate control over emotions, and ultimately, to increasingly subjective and distorted perceptions of reality and to the production of clinical symptoms.

This leads to a pattern in which cognitive distortion can constrict behavior in a fashion that may actually exacerbate existing difficulties, leading to vicious circles of cognitive distortion, distress, and interpersonal impairment. When this occurs, one’s cognition may be further impaired by the resulting Axis I clinical syndromes. Prolonged Axis I symptoms can, in turn, exacerbate personality dysfunction.

This reciprocal interaction between Axis I and Axis II explains why Millon et al. (1997) posited the notion that the presence of Axis I pathology supports the presence of personality pathology. Consequently, it is expected that individuals with greater total pathology, independent of whether this pathology arises from Axis I or Axis II, will experience more frequent cognitive distortions. Cognitive distortions have been reported in PDs (Beck & Freeman, 1990; Beck et al., 2004) and account even for an overlap between some PDs, such as borderline and schizotypal (Rosenberger & Miller, 1989).

Further evidence for the additive effects of depression and Axis II syndromes is offered by studies in which depressed patients with at least one PD were found to have greater frequency of previous episodes of depression, higher levels of distress, and more severe symptomatology (Diguer, Barber, & Luborsky, 1993; Farmer & Nelson-Gray, 1990; Shea et al., 1987). Other
evidence suggests that personality disordered inpatients tend to suffer from earlier initial onset of illness, longer duration of episode, and more suicidal thoughts and/or suicide attempts than those without Axis II comorbidity (Black, Bell, Hulbert, & Nasrallah, 1988).

Moreover, Skodol, Gunderson, MacGlashan, & Dyck, (2002) recently conducted the first study to document and quantify the extent of functional impairment experienced by patients with varying types of PDs in contrast to patients having only an impairing Axis I disorder. This study supported Millon et al.s’ (1997) contention that schizotypal and borderline personality disorders are more severe, because they produced greater dysfunction on virtually every measure of impairment than patients with obsessive-compulsive personality disorder or major depressive disorder alone produced, even after controlling for comorbid Axis I psychopathology and regardless of whether the assessment was interview-based or by patient self-report. Avoidant personality disorder impairment was intermediate. No gender effects were found. It should be noted schizotypal, borderline, and to a lesser extent, avoidant personality disordered patients were significantly more impaired at work, in social relationships, and at leisure than patients with obsessive-compulsive personality disorder or major depressive disorder. These authors convincingly concluded “Personality disorders are a significant source of psychiatric morbidity, accounting for more impairment in functioning than major depressive disorder alone.”

Most patients with PDs enter treatment, seeking relief for an Axis I disorder. There have been a number of studies evaluating treatment response in those meeting criteria for comorbid Axis I and Axis II conditions. Ilardi and Craighead (1999) found that, in formerly depressed patients, rates of relapse into depression occurred 7.4 times faster for patients with comorbid PDs than for those without Axis II personality pathology. Additionally, Axis II pathology accounted for approximately 29% of the variance in dysfunctional attitudes (as measured by the DAS) and
14% of the variance in maladaptive negative event attributions (as measured by the ASQ-N), regardless of whether or not the patient relapsed into depression. This dysfunctional thinking may suggest depressogenic vulnerability in individuals with Axis II disorders. Interestingly, for each Axis II criterion met, there was an 8% decrease in expected survival of remission. Moreover, there was a significant interaction between specific PD Clusters and outcome with Clusters B and C associated with shorter remission times. Surprisingly, the presence of Cluster A diagnoses was actually associated with longer remission. Otherwise, analysis of Axis II clusters was largely consistent with a hypothesized general personality pathology factor associated with dysfunctional cognitions. This study illustrates the fact that more effective identification and amelioration of dysfunctional cognitions associated with comorbid PDs may provide great benefit not only for predicting outcome, but also for combating both personality pathology and depression. Thus, more effective identification and amelioration of dysfunctional cognitions associated with PDs and depression may provide great benefit for predicting outcome and combating depression.

Barber and Muenz (1996) found CT to be significantly more effective than interpersonal therapy (IPT) in treating depression in Avoidant PD patients. Although IPT and CT were both effective in treating PD patients with comorbid depression, those with obsessive personality disorder (OCPD) responded significantly better when treated with IPT rather than CT. However, CT was significantly superior to IPT for depressed patients with comorbid avoidant PD. It was hypothesized the IPT differentially addressed perfectionistic, internal coping strategies characteristic of OCPD, whereas CT was more effective in ameliorating the externalized coping strategies, such as the need for approval, more common to avoidant PD. Nevertheless, common to both of these effective treatment modalities is that both CT and IPT, in part, ameliorate
dysfunctional cognition (e.g., Beck & Freeman, 1990; Beck et al., 2004; Klerman, Weissman, Rounsaville, & Chevron, 1984).

Additional evidence for the interactive and additive nature of Axis I and Axis II symptomatology arises from a naturalistic study demonstrating an important fact; in a comparison of depressed patients without a personality disorder and of patients with depression and PDs, the latter reported more severe depressive symptoms at intake and more residual problems at the conclusion of CT. However, there was no evidence that patients with depression and PDs benefited less from CT than depressed patients without a PD. Rather, treatment outcome was negatively influenced by avoidant and paranoid beliefs whether or not a PD was diagnosed. Specifically, avoidant beliefs predicted changes in self-reported depressive symptoms and paranoid beliefs predicted changes in therapist-rated general functioning (Kuyken, Kurzer, DeRubeis, Beck, & Brown, 2001).

Similarly, Hardy, Barkham, Shapiro, Stiles, Rees, & Reynolds, (1995) found that patients with depression, which was complicated by Cluster C PDs also presented with more severe symptomatology than patients with uncomplicated depression. Interestingly, there was an interaction between the presence of severe PD and treatment modality in outcome. At posttreatment and one-year follow-up, there was no significant difference between complicated and uncomplicated depressed patients when treated with CBT. However, severely depressed PD patients who were treated with psychodynamic—interpersonal psychotherapy continued to maintain more severe symptomatology at posttreatment and at 1-year follow-up. This lends further support to the central role of dysfunctional cognition, targeted, specifically by CBT, in the maintenance and treatment of Axis I and Axis II conditions.
Butler and Beck (2000) included many of the following studies in their meta-analysis of treatment outcome for CT with anxiety disorders:

**Panic Disorder**

CT research has been particularly impressive in regard to panic disorder. For example, Sokol, Beck, Greenberg, Wright, & Berchick (1989) found CT to be significantly superior to supportive therapy in eliminating panic attacks. Another study found CT to be significantly more effective than behavior therapy, imipramine, and placebo control in ameliorating panic attacks at the end of treatment, and at 1-year follow-up (Clark, 1991). Another important advantage of CT was far lower attrition rates, as compared with behavior therapy (often employing aversive exposure methods) or wait-list controls.

Gould et al. (1995) conducted a meta-analysis comparing cognitive interventions with more behavioral interventions based on exposure treatments and various control conditions. The most effective treatments were those that combined cognitive restructuring with interoceptive exposure (ES = 0.88), the mainstay of the traditional CT approach (e.g., Barlow, 1988; Taylor, 2000). CT was superior to pharmacological interventions (ES = 0.47) or combination treatments (ES = 0.56). One-year follow indicated excellent resiliency of treatment effects, with virtually no slippage in effect size. Another advantage for CT was a significantly lower attrition rate, with only 5.6% of those treated with CT relapsing within the first year after treatment, compared with
19.8% of those treated pharmacologically. Finally, Oei et al. (1999) demonstrated that CT reduced panic symptoms to levels near or below those found in the general population.

**Social Phobia**

Butler & Beck (2000) also reviewed meta-analyses related to CT for social phobia (Feske & Chambless, 1995; Gould, Buckminster, Pollack, Otto, Yap, 1997). Gould et al. (1997) found that CT was superior to exposure interventions without cognitive restructuring (ES = 0.89) and, surprisingly, the combination of the two interventions (ES = .80) Consistent with studies on numerous other Axis I disorders, CT was also superior to wait-list and placebo attention controls (ES = 0.93) for treating social phobia.

**Generalized Anxiety Disorder**

CT has also been found to be effective in treating Axis I conditions, such as generalized anxiety disorder (Butler Fennell, Robson, & Gelder, 1991). In a meta-analysis of studies comparing CT with controls and pharmacotherapy for treating generalized anxiety disorder, Gould, Otto, Pollack, and Yap (1997) determined that CT was significantly more effective than nondirective therapy, no-treatment controls, wait list controls, or placebo controls. However, CT combined with drug therapy, the latter consisting mainly of Benzodiazepines, were not statistically different at post-treatment.
Obsessive-Compulsive Disorder

According to (Butler & Beck, 2000) exposure and response prevention is often the frontline psychological treatment of choice for obsessive-compulsive disorder (OCD; e.g., Riggs & Foa, 1993). However, Abramowitz (1997) found no significant differences in effect sizes when comparing the exposure and response prevention with CT for treating OCD. Similarly, Van Balkom, van Oppen, Vermeulen, van Dyck, Nauta, & Vorst, (1994) determined, via meta-analysis, that both cognitive and cognitive-behavioral treatments resulted in substantial reductions in OCD symptoms.

Anxiety Complicated by Personality Disorders

Although PDs are subject to increasing investigation (Reich, 2003; Ruegg & Allen, 1995), relatively few studies have focused on comorbid anxiety and PD, as compared with comorbid depression and Axis II disorders. This issue has important ramifications for assessment and treatment, as well, because of a growing emphasis on the use and cost of mental health services (Phillips, Shea, Warshaw & Dyck, 2001).

Three naturalistic, prospective, longitudinal studies of panic disorder (Faravelli & Albanesi, 1987; Noyes, Reich, Christiansen, Suelzer, Pfohl & Coryell, 1990; Pollack, Otto, Rosenbaum, Sachs, O'Neil, Asher et al., 1990) reported that the presence of PDs was associated with poor treatment outcome for panic disorder symptoms and functioning.

Moreover, another longitudinal study linked panic disorder and comorbid PDs with poor treatment outcome for panic disorder symptoms and functioning (Pollack, Otto, Rosenbaum,
Sachs, O'Neil, Asher, Meltzer-Brody, 1990; Pollack Otto, Rosenbaum, & Sachs 1992). However, it should be noted that this study was limited by the use of self-report PD instruments and a briefer follow-up of only 1 year. Although convincing, the empirical data regarding the contribution of PDs to anxiety disorder outcome is limited, inconsistent, and contradictory.

Other studies have shown that the presence of PDs decreases treatment effectiveness for specific anxiety disorders. For example, in a multisite, prospective, longitudinal, naturalistic study assessing PDs over a five-year period, Massion, Dyck, Shea, Phillips, Warshaw, & Keller (2002) found that the presence of a personality disorder predicted a 39% lower likelihood of social phobia remission and a 30% lower likelihood of remission GAD, even after controlling for the effects of major depression. However, contrary to previous naturalistic studies, these researchers determined that PDs had no effect on remission form panic disorder remission. But the effects of PDs on anxiety were differential. Specifically, dependent personality disorder predicted a 41% lower probability of remission from GAD; avoidant personality disorder was associated with a 34% reduced chance for remission in GAD, and a 14% reduced remission rate in social phobia. Surprisingly, the presence of borderline personality disorder failed to predict negative outcome.

In other studies of generalized anxiety disorder, Yonkers, Warshaw, Massion, & Keller (1996) reported an interaction effect between personality and clinical disorders. These investigators demonstrated the fact that the presence of cluster B or C PDs were differentially negative treatment indicators. Avoidant personality disorder predicted a poor outcome for both generalized anxiety disorder and social phobia. It is interesting to note that the presence of a PD diagnosis has deleterious treatment effects even in pharmacotherapy (Versiani, Nardi, Mindim, Pinto, Saboya, & Kovacs, 1996; Versiani & Amrein, 1997). Accurately assessing Axis II
pathology is crucial because another study found that fully 37% of individuals meeting criteria for social phobia also met criteria for two PDs, namely, avoidant and OCPD (Turner, Beidel, Borden, Stanley, Jacob, 1991).

In summary, it appears that when Axis I disorders are complicated by PDs, outcome is often less favorable. The literature has long reflected that the presence of PDs may correlate with clinical syndromes to a degree that is far more than anticipated and that such comorbidity may impede treatment success (see Reich, 2003 for review). This is consistent with the notion that there may be an additive effect when comorbidity is present whether or not the disorders appear on either of the two DSM-IV-TR diagnostic axes (Millon et al, 1997). It should be noted that most patients with PDs do benefit from treatment, but not always as much as those without Axis II pathology (Beck et al., 2004). Additionally, cognitive distortions have demonstrated a correlation with a number of Axis I and Axis II conditions and CT has been shown to be effective in ameliorating these distorted thinking patterns and subsequent dysphoria and impairment (Beck et al., 2004). These facts also illustrate the need for adequate assessment prior to treatment planning. In research and in practice, CT enjoys considerable empirical support for treating many frequently occurring disorders across Axis I and Axis II, in a broad array of populations and formats (Beck, 1993).
Demonstration of Treatment Outcome

Outcome and Measures of Cognitive Distortion

According to Pickstone (2001), the contemporary revolution in healthcare, in general, has been stunning. Clinicians have come under increasing pressure to demonstrate treatment effectiveness in the modern cost-accountable and resource-limited world. Forces militating for efficiency include managed care, rising costs, demands of distraught patients, and therapists’ own desires to alleviate distress. Clinicians are under increasing pressure to demonstrate the fact that their methods are not only effective, but also efficient. Pressure arises, in large part, from managed care insurers who may limit the number of sessions for which they reimburse clinicians for specific disorders. This has spurred the need for clinicians to provide more effective therapy in less time (McDaniel, 1995). This is especially true of CT and CBT practitioners, who endeavor to provide effective, brief therapy (Beck, 1996). As a consequence, although motivation may vary, insurers, patients and clinicians ultimately share the same goal: salubrious outcome provided in an optimally expeditious manner (Budman, & Gurman, 1988).

Demonstrating treatment effectiveness requires objective, psychometrically sound measures. According to Kazdin (1998), self-report instruments provide cost- and time-efficient tools to establish baseline data, assess current levels of functioning, supply a basis to modify treatment strategies, and substantiate treatment outcome. Although the foundation of CT and CBT is the exploration and modification of cognition (e.g., Beck, 1979; Burns, 1999), relatively few instruments have been validated to detail adequately one of the most fundamental cognitive process involved in psychological dysfunction, specifically, cognitive distortions (Yurica, 2002).
At this time, in fact, the literature reflects only five instruments with acceptable psychometric properties that profess to measure some aspect of cognitive distortions. In chronological order of publication, these measures include: The Cognitive Errors Questionnaire (CEQ; Lefebvre, 1981), The Dysfunctional Attitude Scale (DAS-A, DAS-B; Weisman, 1979), The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), The Cognitive Distortions Scale (CDS; Briere, 2001), and The Inventory of Cognitive Distortions (ICD; Yurica & DiTomasso, 2002). In research, measures of cognitive distortion have been used to document levels of distress and psychopathology (e.g., Yurica, 2002), response to psychotropic medication (Meyer, Kenedy, Korman, Brown, DaSilva, et al., 2003), response to CT and CBT (DeRubeis, Evans, Hollon, Garvey, Grove & Tuason, 1990), and even as predictors by organizational and consumer psychologists (Netmeyer, Williamson, Burton, & Biswas, 2002). A review of the professional literature at this time indicates that the DAS and, to a lesser extent the CEQ, have become used increasingly for the measure of cognitive distortion in research. However, no data exists regarding their application in clinical practice. The question arises: How can one best measure cognitive distortion?

Measuring Cognitive Distortions

Cognitive distortions are generally assessed via self-report inventories. A number of such instruments have been produced purporting to measure features of cognition and behavior relating to specific Axis I disorders. Examples of such instruments include the Beck Depression Inventory—II (BDI—II; Beck, Steer, & Brown 1996) the Beck Anxiety Inventory (BAI; Beck, & Steer, 1990), the Panic Attack Cognition Questionnaire (PAC; Clum, Boyles, Bordin, &
Watkins, 1990) the Agoraphobia Cognitions Questionnaire (ACQ; Chambless, Caputo, Bright, & Gallagher, 1984), Social Anxiety Thoughts Questionnaire (SAT; Hartman, 1984), and the Fear of Negative Evaluation Scale (Watson & Friend, 1983). Although these instruments assess distorted cognitions, they are limited because they identify only cognitions related to specific disorders or syndromes.

On the other hand, additional instruments have been developed to assess the quantity and content of positive and negative cognitions, such as the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) the Automatic Thoughts Questionnaire—Revised (ATQ-R; Kendall, Howard, & Hayes, 1989), and the Cognitive Triad Inventory (CTI; Beckham, Leber, Watkins, Boyer, & Cook, 1986). Another instrument, the Young Schema Questionnaire-Long Form, 2nd ed. (YSQ-L2; Young & Brown, 1990), assesses cognition for purposes of identifying underlying schema. Finally, several inventories have been developed to measure irrational beliefs and attitudes such as the Rational Behavior Inventory (RBI; Shorkey & Whiteman, 1987), the Irrational Values Scale (IVS; MacDonald, 1972) the Irrational Beliefs Scale (IBS; Malouff & Schute, 1986) and the General Attitude and Belief Scale (GABS; DiGiuseppe, Leaf, Exner, & Robin). Although these instruments assess constructs related to cognitive distortion, they cannot claim to quantify specific distortions or their severity.

A literature review revealed five instruments specifically designed to assess the construct of cognitive distortions in a clinical context. These instruments are as follows: The Dysfunctional Attitude Scale (DAS; Weissman & 1979), the Automatic Thoughts Questionnaire (ATQ, Hollon & Kendall, 1980), the Cognitive Error Questionnaire (CEQ; Lefebvre, 1981), the Cognitive Distortion Scale (CDS; Briere, 2000), and the Inventory of Cognitive Distortions (Yurica & DiTomasso, 2002). Of these measures, only the ICD assesses the frequency of 11 factor-
analyzed cognitive distortions culminating in a Total Cognitive Distortion score—the dependent variable of interest in the present study.

However, most of these instruments suffer from a number of critical limitations.

*Limitations of Existing Measures of Cognitive Distortion*

Many of the existing measures of cognitive distortion are lacking in a number of ways that are relevant to the present research. Specifically, the ATQ (Hollon & Kendall, 1980), DAS (Weissman & 1979), and CEQ (Lefebvre, 1981) were designed for assessing cognitive distortions attendant to depression. Furthermore, the DAS yields only a total distortion score. This is problematic in research because the DAS fails to illuminate a clear picture about which specific distortions correlate with particular disorders. Moreover, in assessment and clinical practice, the DAS is designed to assess dysfunctional beliefs and fails to identify many important distortions that may be targeted in treatment.

Second, of the existing measures of cognitive distortion, only the ICD measures 11 different cognitive distortions on separate subscales, thereby offering a significant advantage over both the DAS and CEQ, because the DAS is limited to only six types of distortions (arbitrary inference, overgeneralization, selective abstraction, magnification or minimization, dichotomous reasoning, and personalization), whereas the CEQ is further limited to only four varieties of distortion (overgeneralization, arbitrary inference, selective abstraction, and magnification or minimization).

Third, although the CDS (Briere, 2000) is more useful for identifying specific cognitive distortions, it is still limited because it yields only the following five distortions: helplessness,
hopelessness, self-criticism, self-blame, and preoccupation with danger. Consequently, the instrument fails to identify a number of important theoretical cognitive distortions, such as those identified by Yurica (2002).

Third, as Yurica (2002) explicated, all four instruments lack specificity in their definitions of the term cognitive distortions, and suffer from “… poor consensus in definition, variable measurement across instruments, limited applicability, and outdated, limited scope of the measurement of cognitive distortions…” (p. 57). However, of all of these measures, only the ICD assesses the frequency of Yurica’s (2002) 11 factor-analyzed cognitive distortions and yields a total score of cognitive distortions—the dependent variable of interest in the present study.

The Inventory of Cognitive Distortions

The ICD (Yurica & DiTomasso, 2002) provides the latest and most comprehensive, structured, psychometrically validated self-report instrument for measuring cognitive distortions in a heterogeneous, adult, clinical, outpatient population. The ICD is a 69-item self-report inventory designed specifically to measure the frequency of distorted cognitions in an outpatient clinical population. The instrument consists of single sentence items, answered on a five-point Likert scale. The ICD provides scores on 11 factors/cognitive distortions. According to Yurica (2002), the ICD was specifically designed to assess “self-statement cognitive products representative of particular types of cognitive distortions in differing mental health disorders” (p. 103). CT experts and factor analysis have established good content validity. Three cognitive therapy experts came to a 100% independent agreement on the original 69 items.
Yurica (2002) explicitly designed the ICD to validate the 16 theorized cognitive distortions (Beck et al., 1979; Burns, 1980, 1999; Freeman & DeWolf, 1992; Freeman & Oster, 1999). However, of the original theorized cognitive distortions, factor analysis revealed 11 fundamental factors that closely resembled 10 theory-derived cognitive distortion subscales (Externalization of Self-Worth, Fortune-Telling, Magnification, Labeling, Perfectionism, Comparison to Others, Emotional Reasoning, Arbitrary Inference/Jumping to Conclusion, Minimization, Mind-Reading), in addition to one important new cognitive distortion (Emotional Reasoning and Decision-Making). It should be noted that the ICD did not retain the theoretical construct of overgeneralization because this was the only distortion that failed to receive a 100% agreement among independent cognitive therapy experts.

Despite convincing theoretical and empirical evidence for the fundamental role of cognitive distortions in both the cognitive model and cognitive-behavioral therapies, there has been surprisingly little effort to objectively quantify the frequency with which these cognitive events occur. In fact, to date, only two instruments, the ICD and the CDS, have been empirically validated via factor-analysis of the theoretical cognitive distortions to test the frequency of cognitive distortions with a clinical sample of heterogeneous, adult, mental health outpatients. ICD also offers several advantages over other measures of cognitive distortion. First, it provides the latest factor analysis of the original theorized cognitive distortions. Second, it identifies and evaluates a larger number of cognitive distortions than any of the other competing instruments. Third, the distortions identified by the ICD have been demonstrated to span diagnostic categories, rather than being restricted to a particular diagnosis (Yurica, 2002).

Yurica (2002) determined that the ICD significantly and positively correlated with widely accepted measures of depression, the (BDI-II) anxiety (BAI), and dysfunctional attitudes (DAS).
Comparing scores of outpatient psychiatric patients (n=122) with a comparison control group (n=66), the ICD demonstrated impressive internal consistency, having a total scale estimate of internal reliability measuring a Coefficient alpha of .998 (N=28), indicating good homogeneity of item content. Additionally, the ICD total scale scores produced test-retest reliability of r = .98, indicating good stability. Patterns of cognitive distortion appeared to be stable and enduring, even after a cognitively and emotionally traumatic event of historic proportion, the attacks of September 11, 2001. Such an enduring pattern of cognition is more consistent with trait- versus state-like thinking. However, it is also possible that such an unprecedented mass trauma may have artificially affected ICD reliability.

Nonetheless, such reliability is consistent with Alford and Beck’s (1997) revised cognitive theory, in which cognitive distortion was postulated to include both errors in content/meaning, on the one hand, and cognitive processing/meaning elaboration, on the other hand. It was proposed that predisposition to specific cognitive distortions or cognitive vulnerabilities leaves individuals susceptible to specific disorders. This proposal is also supported by research of the interaction of parenting and children’s coping styles, as well as developmental theories relating to cognitive distortions (Yurica, 2002).

In summary, Yurica, (2002) found a robust and significantly positive correlation between cognitive distortions on the one hand, and anxiety, depressive symptoms and dysfunctional attitudes, on the other hand. A review of the literature revealed no similar research examining the relationship between the frequency of the 11 factor analyzed cognitive distortions and Axis II conditions. Thus, this study endeavors to expand further the utility of this promising instrument into additional specific clinical syndromes, and beyond that, into the personality disorder domain.
Outcome and Measures of Psychopathology

The Minnesota Multiphasic Personality Inventory-2

A number of widely accepted, standardized self-report measures exist for psychopathology outcome measurement. These instruments are also employed for the diagnostic classification of research participants and clinical patients. Such measures are valuable because they provide an indication both of the number and severity of clinical disorders, mainly along accepted nosology. Since Hathaway & McKinley (1943) originally developed The Minnesota Multiphasic Personality Inventory (MMPI), it has become the most widely used and researched clinical assessment inventory, with over 10,000 published research references (Groth-Marnat, 1999). Despite its enormous value, however, its most recent incarnation, the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989), has its limitations. Most significantly, according to Groth-Marnat (1999), the MMPI-2 may be prohibitively time-consuming; it is, in fact, with 567 items, the lengthiest of such measures. Additional MMPI-2 limitations include high item overlap, resulting in high intercorrelations among various scales, the use of obsolete diagnostic labels (such as, Psychasthenia), ineffectiveness in diagnosing either Axis I or Axis II conditions, including the criteria of the current Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association [APA]; 2000).
Another widely accepted self-report measure is the Millon Clinical Multiaxial Inventory-III (MCMI-III; Millon, 1994). The MCMI-III purports to “help the clinician assess DSM-IV-related personality disorders and clinical syndromes” and provide information relating to emotional adjustment, and attitude toward taking the test (Millon, 1994, p. 17). A review of the literature reveals that various versions of the MCMI have been used as outcome measures in hundreds of studies, for such disorders as post-traumatic stress disorder (Allen, Coyne, & Huntoon, 1998), PDs (Alnaes & Torgensen, 1989; Bayon, Hill, Svrakic, Przybeck, & Cloninger, 1996; Joiner & Rudd, 2002; de Groot, Franken, van der Meer, & Hendriks, 2003), personality cluster traits (Bender, Farber, & Geller, 2001; Espelage, Mazzeo, Sherman, & Thompson, 2002), narcissistic personality disorder (Auerbach, 1984), forensic patients (Blackburn, 1998; Rogers, 2003), substance abusers (Craig, 1997a, 1997b; Craig, & Olson 1998), depression (Davis & Hayes, 1997; Libb, Stankovic, Sokol, Freeman, Houck, & Switzer, 1990), schizophrenia (del Rosario, McCann, & Navarra, 1994), bipolar disorder (Turley, Bates, Edwards, & Jackson, 1992), anxiety disorders (Freeman, Kablinger, Rolland, & Brannon, 1999), aggressiveness (Holt, Meloy, & Strack, 1999), and for all manner of psychiatric outpatients (Piersma & Boes, 1997).

The MCMI-III is also used extensively in clinical practice (Groth-Marnat, 1999).

The MCMI—III was normed on a heterogeneous sample of 998 males and females representing a wide variety of diagnoses and demographic variables. The sample included patients seen in independent practices, in mental health centers, in clinics, in residential settings,
and in hospitals. Because norms were based exclusively on a clinical sample, the instrument is not appropriate for use with nonclinical populations due to a high frequency of diagnostic false-positives (Millon & Davis, 1996).

The MCMI-III has become a frequently used measure of clinical syndromes and PDs and has good empirical validation (e.g., Choca & VanDenburg, 1997; Craig, 1993, 1997a; Hsu, 2002). The MCMI—III PD scales include all of the PDs contained in the DSM—IV plus four additional, nonofficial PDs (depressive, passive—aggressive, self-defeating, and sadistic). Although these additional diagnoses are no longer in the official nosology, Millon et al (1997) maintain that these disorders, nonetheless “exist in nature,” despite having been deleted from the DSM. The MCMI—III is widely used by clinicians and researchers, and there is an extensive literature reporting favorable psychometric properties (Craig & Weinberg, 1993; Millon & Davis, 1996; Retzlaff, 1995). More generally, studies comparing a variety of self-report and interview forms of diagnostic assessment have provided little evidence that one test or method is superior to others, particularly in evaluating PDs (Widiger & Sanderson, 1995).

In discussing the assessment and quantification of psychological disorders, Millon (1999, p. 4) philosophically observed the following:

The natural world is complex and intricate, and its phenomena are not easy to classify. Our concepts and categories are only tools to guide observation, interpret its results, and solve problems. Alternative concepts may help us to understand a single subject of inquiry… In psychology and other soft sciences, we sometimes have to impose arbitrary systems that suggest more clarity and coherence than the imprecise nature of the subject may warrant…. Debates on these issues may sometimes degenerate into semantic arguments and theoretical hair-splitting, but conceptual distinctions and the assumptions
they reflect are a necessary part of scientific decision-making. However, clinicians and researchers are ultimately concerned with the welfare of real people, holistic collections of inextricably interconnected configurations of cognition, behavior, and affect.

Millon (1999) acknowledges this reality by advocating a “psychosynergistic” assessment that integrates Axis I clinical syndromes with Axis II PDs into a single dynamic psychological profile, which recognizes that, “Each person becomes a synthesized and substantive whole that is greater than the sum of its multiaxial parts.” (p. 4). Thus, impairment and distress may be manifested as an Axis I syndrome, an Axis II disorder, or in problems across both axes. To this end, the MCMI—III, does not proceed through a serial interpretation of individual scales; rather, it transforms their meanings into a holistic profile—a profile that Millon (1999) posited can be legitimately explained by behavioral, psychodynamic or cognitive perspectives.

According to Millon et al. (1997, p. 124) “the greater the number of scales elevated above BR 75, the greater the personality pathology” and the higher the BR scale score elevation above BR 75, the more severe the disturbance. Although all MCMI-III BR scores above 75 are interpretable, a score of BR 75 is expected to indicate the presence of a clinically significant personality “style” or “syndrome”; BR 85, however, is indicative of symptoms sufficient to warrant a diagnosis of PD (p. 120). Thus, for purposes of assessing Axis II pathology, the sum of the positive distance from the BR 75 cutoff score for any of the specific MCMI-III Clinical Personality Pattern and/or Severe Personality Pathology scales should capture the total pathology on Axis II.

Millon specifically intended the original Millon Clinical Multiaxial Inventory (Millon & Davis, 1977) to assist in diagnosing PDs as well as clinical syndromes (Groth-Marnat, 1999; Millon & Davis, 1977). The instrument has undergone a number of revisions in order to
accommodate relevant empirical findings. The most recent version, the MCMI—III (Millon, 1994) is a self-report measure consisting of 175 true or false statements, rendering scores on 28 scales in the following categories: three Modifying Indices, one Validity Scale, three Severe Personality Pathology scales, 11 PD scales, seven clinical syndrome scales, and three additional Severe Clinical Scales.

Clinical Syndrome Scale.

Separate MCMI—III categories distinguish Axis I from more enduring Axis II disorders. Within clinical axes, scales are further categorized according to severity. Thus, three Severe Clinical Syndromes (Thought Disorder, Delusional Disorder, and Major Depression) are assessed independently of more moderate or “neurotic” Clinical Syndromes Scale scores, composed of the following seven subscales: Anxiety, Somatoform, Bipolar Manic, Dysthymia, Alcohol Dependence, Drug Dependence, and Post-Traumatic Stress Disorder (Millon & Davis, 1996, p. 3). The instrument also provides data regarding psychosocial stressors and their therapeutic implications. It should be noted that the presence of certain Axis I conditions, such as particular dysthymic and anxiety states can elevate or depress certain PD scales (Shea et al, 1987). However, the MCMI automatically compensates for the influence of this state (Axis I)—trait (Axis II) interaction (Millon, 1994; Millon & Davis, 1996).
**Personality Disorder Scales.**

The MCMI-III consists of two personality disorder scales, both consisting of a total of 14 theorized PDs. The first scale, Clinical Personality Pattern Scales, contains the following 11 personality subscales: Schizoid, Avoidant, Depressive, Dependent, Histrionic, Narcissistic, Antisocial, Aggressive/Sadistic, Compulsive, Passive-Aggressive (negativistic and Self-Defeating (Masochistic). The second personality scale, Severe Personality Scales consists of the following three subscales: Schizotypal, Borderline, and Paranoid (Millon, 1994; Millon & Davis, 1996).

Axis II PDs are scored in a manner similar to Axis I, with BR scale scores of 75 to 84 on Axis II suggestive of personality traits; however, scores of 85 or greater provide strong empirical support for the presence of personality disorder(s), and according to Millon, resultant Axis I clinical pathology as the personality disorder deficits exacerbate distress and interpersonal difficulties (Millon & Davis, 1996).

In a recent study conducted with a combined sample of clinical and nonclinical populations, O’Connor & Dyce (2001) demonstrated empirically that the MCMI—III (Millon, 1994) differentiated individuals with PDs from those failing to meet Axis II diagnostic criteria. Normal and disordered personalities were found to coexist in a variety of regions of the multivariate space, based on the 5-factor model (FFM) of personality (Widiger, 2000). Examination of the interpersonal dimensions chart (Figure 1) reveals that within regions, the profiles of normal and disordered personalities were very similar in characteristic configuration or vector but notably different in vector length. Moreover, this difference was detected by the MCMI-III. Those with PDs appear to be “out there” in inner experience, interpersonal behavior, and in this case,
geometric configuration. Significantly, although length of vector predicted the presence of Axis II pathology, it failed to predict any specific personality disorder. Consequently, it is predicted that the severity of cognitive distortion will predict the presence and severity of Axis II conditions. Although the severity of cognitive distortion may be able to predict the extremity of the vector (severity) and presence of PD(s) or clinical disorder(s), distorted thinking is not, however, considered capable of predicting the direction of the vector, that is, specific personality disorder.
Note. O’Connor & Dyce (2001) empirically demonstrated that the MCMI—III and, to a lesser extent, the MMPI—II differentiated individuals with PDs from those failing to meet Axis II diagnostic criteria. Although normal and disordered personalities were found to coexist in a variety of regions of the multivariate space based on the 5-factor model (FFM) of personality (Widiger, 2000), those with PDs appear to be “out there” in inner experience, interpersonal behavior, and in this case, geometric configuration. Source: O’Connor, B. P., & Dyce, J. A. (2001). Rigid and extreme: A geometric representation of PDs in five-factor model space. *Journal of Personality and Social Psychology, 81*, 1119-1130.
Personality-disordered individuals tended to be located in the perimeters or outer regions of the FFM space, as indicated by their longer vector lengths. This indicates that the presence and severity of a personality disorder was manifested in a difference in the quantity, rather than the quality of four of the five FFM dimensions: Neuroticism, extraversion, agreeableness, and conscientiousness were differentially more extreme in individuals with PDs. Specifically, those reaching the threshold for significance on MCMI-III, with BR scores equal to or greater than BR 75 or BR 85, exhibited significantly more extremity and rigidity on these dimensions.

In summary and in support of the Cognitive Model, evidence exists suggesting that as the severity or the number of Axis I or Axis II conditions increases, there will be a correspondent increase in pathology. In other words, there should be a positive correlation between measures of pathology and measures of cognitive distortion.

**MCMI Scoring Methods**

Scale scores have been established by actuarial base-rate-transformed and base rate-adjusted PD scale scores reflecting the prevalence of the syndromes or characteristics in the general population, as described in the MCMI—III manual (Millon & Davis, 1996). Empirical evidence suggests that BR scores offer more diagnostic accuracy than T scores (Duthie & Vincent, 1986). Derived from a standardization sample of 1079 clinical mental health patients, Millon & Davis (1997) recommended cutoff scores are as follows:

- 35 = median score for “normal”/nonpsychiatric groups.
• 60 = median score for psychiatric groups.
• 75 = presence of features.
• 85 = definite characteristics.

The scales were explicitly designed to measure the official DSM—IV diagnostic criteria and Millon’s evolutionary theory of PDs (Millon, 1990, Millon et al., 1996). In addition, with a completion time of approximately 25 minutes, the MCMI—III is shorter and thus more practical and appealing than comparable instruments for patients and clinicians (Millon & Davis, 1996). The three-stage validation process is an additional strength of the MCMI.

Evidence for the validity of the scales has been provided in the form of correlations with ratings by clinicians, correlations with “collateral tests measuring of identical constructs”, and strong diagnostic efficiency statistics (Millon, 1994, p. 30). The instrument has been validated with a variety of clinical samples including inpatients, outpatients and drug and alcohol center patients (Hsu, 2002; Millon, 1994; Millon & Davis, 1996). The MCMI—III is widely used both by clinicians and researchers, resulting in an extensive literature reporting favorable psychometric properties (e.g., Craig & Weinberg, 1993; Retzlaff, 1995).

The MCMI-III has demonstrated high test-retest validity with a median for all scales of .91 (Millon, 1994). Test-retest reliability reflected high stability, ranging from a low of .82 for debasement to a high of .96 for Bipolar: Manic with a median stability coefficient of .91. It should be noted, though, that the delay between test and retest was only 5 to 14 days. These results indicate high stability, at least over short periods of time. However, Overholser, (1989) found .69 and .67 test-retest validities for the personality scales and clinical scales, respectively, with retests occurring at a mean interval of 379 days.
Strong internal consistency was also confirmed with alpha coefficients surpassing .80 for 20 scales, ranging from a high of .90 for Depression and a low of .66 for the Compulsion scale (Millon, 1994). Correlations between the MCMI-I and MCMI-III scales are moderately high (Groth-Marnat, 1999). Later versions of the MCMI have also demonstrated little difference between stability on personality scales versus clinical scales (Groth-Marnat, 1999). In fact, the MCMI-III manual (Millon et al., 1997) actually indicates a slightly lower mean of .89 for the personality scales versus .91 for the clinical scales.

**Concurrent validity.**

The MCMI-III also demonstrated good concurrent validity, with the Major Depression and Dysthymia scales correlating with the Beck Depression Inventory, .74 and .71, respectively (Millon & Davis, 1996). However, although the State Trait Anxiety Inventory (STAI; Spielberger, 1983) correlated more highly with the Major Depression scale (.59), the Anxiety scale still correlated moderately with state (.55) and trait (.58) anxiety. Consequently, caution might be appropriate regarding discriminant validity; for example, the BDI also correlated .63 with the PTSD and .62 with the Thought Disorder scales (Millon et al, 1997).

**Predictive validity.**

The aggressive personality disorder scales and several of the neurotic scales correlated with future institutional violence in prison populations (Retzlaff, Stoner, & Kleinsasser, 2002).

**Discriminant validity.**

The MCMI—III has demonstrated both convergent and discriminant validity as a measure of sleep disturbance (Allen, Console, Brethour, 2000).
Limitations of the MCMI—III

Because the MCMI-III data is based exclusively on individuals who were undergoing psychotherapy, psychological assessment, or on those who were evincing emotional or interpersonal problems, the instrument is not appropriate for use in nonclinical populations. Moreover, the instrument provides valuable data regarding personality and psychopathology; however, scores are best regarded as a cross-sectional snapshot of the individual. Consequently, it might be ideal to augment the instrument with extensive corroborating information from collateral sources and biographical interviews of the type that are prohibitive to this sort of experimental procedure (Kazdin, 1998; Millon & Davis, 1996). A lack of discriminant validity has been noted between clinical and nonclinical populations (Boyle & Loick, 2000). Millon & Davis, (1996) recommend a multimethod approach in which MCMI results are evaluated in the light of independent clinical evidence such as other psychological tests, observed behavior, case history, and data gathered through clinical interviews.

Claims of “on the mark” validity for the MCMI-III range from 55 to 65% with “off-target” errors in 10 to 15% of cases indicating a quantitative range of five to six times greater than chance (Millon & Davis, 1996, p. 7). The instrument is most accurate for individuals in the moderate range of disturbance. This means that more acutely disturbed or psychotic individuals may be underdiagnosed, whereas those experiencing milder adjustment disorders or transient stressors are more liable to be overdiagnosed (Millon & Davis, 1996).

The MCMI shares limitations of many other self-report measures, including vague items and language, cultural assumptions, and state-bias (Hsu, 2002).
Although, studies comparing various self-report and interview forms of PD assessment have provided little evidence that one test or method is superior to the other (Widiger & Sanderson, 1995), the relative brevity, diagnostic breadth, and psychometric validity make the MCMI-III an appealing instrument.

Summary

Overwhelming empirical evidence supports the cognitive model of psychological disorders, which posits the idea that cognitive distortions may precipitate, attend, maintain, and exacerbate a wide range of clinical problems. To measure these problems, the MCMI—III provides a practical, psychometrically sound instrument for assessing psychological disorders on both Axis I and Axis II. Similarly, the ICD appears to be the most comprehensive, psychometrically validated measure of cognitive distortion to date.

Cognitive Distortions in
Personality Disorders and Clinical Syndromes

Personality Disorders have long represented one of the most perplexing and frustrating facets of psychopathology confronting clinicians and researchers (Nigg & Goldsmith, 1994). The lives of the personality disordered are often unusually stressful for themselves and their families. The impact of PDs can range from annoyance to increased suicidality for both patients and for those with whom they interact. In fact, high stress combined with concurrent PD diagnosis has
been correlated with elevated risk of suicidal behavior (Zimmerman, Pfohl, Stangl, & Coryell, 1985).

According to Beck, Butler, Brown, Dahlggaard, Newman and Beck (2001, p. 1214), “…the essence of a personality disorder is revealed in the dysfunctional beliefs that characterize and perpetuate it.” Cognitive distortions (Beck et al., 1979; Burns, 1980; 1999; Freeman & Oster 1999) contributing to those dysfunctional beliefs may foster and maintain an enduring, rigid, and pervasive pattern of inner experience and behavior that deviates markedly from what is expected by one’s culture (Beck & Freeman, 1990). When this occurs, one may experience subjective distress, interpersonal problems, and/or deficits in impulse control. Once these symptoms are of sufficient quantity, chronicity, and/or severity, the diagnosis of a PD may be appropriate. Thus, cognitive distortions can cause severe and chronic problems for PD patients (Beck, & Freeman, 1990; Beck et al., 2004; Freeman & Oster 1999).

The following illustration, typical of many patients diagnosed with obsessive-compulsive PD (OCPD), illustrates virtually all of Yurica and DiTomasso (2001) empirically validated cognitive distortions (distortions italicized): *Perfectionism*, characteristic of many OCPD patients (Beck & Freeman, 1990; Beck et al., 2004), can lead to avoidance of personal and occupational tasks for fear that they will be unable to live up to unobtainable idealistic standards. When complicated by *dichotomous/black and white thinking*, this can lead OCPD patients to expect inevitable and abject failure in everything perceived to be significant. Even if they attempt an activity, *magnification* of minor errors and *minimization* of success maintains a negative confirmatory bias, making the individual liable to make *arbitrary inferences/jump to conclusions* that they have failed before they have ever given themselves a chance to succeed. In this way, *externalization of self-worth* occurs as the individual’s self-esteem becomes conditional on the
quality and quantity of his or her work product. Because the patient inevitably fails to meet these impossible standards, he or she may engage in chronic upward social comparison to others. The OCPD patient, then, may come to label him- or herself as defective, helpless, or unlovable, leading to a further magnification of the perceived problem. Thus, it is easy to understand how this interlocking knot of cognitive distortions may lead to shame, frustration, anger, and a host of other dysphoric emotions as well as maladaptive behavior, which may maintain dysfunctional schema at the core of the process (Young, 1999). These processes are theorized to be similar across the official DSM-IV-TR nosology (APA, 2000).

There is evidence that cognitive distortions, as measured by the Dysfunctional Attitude Scale (Weissman & Beck, 1978), remit in most patients when their depression abates, rendering their cognition indistinguishable from nondepressed controls (Blackburn, Eunson, & Bishop, 1986). These results support Beck’s (1976) notion that depression results from dormant maladaptive schema(s), which are often activated by negative life events.

However, it has also been demonstrated empirically that the cognitive distortions of patients diagnosed with PDs remain intact even after depression remits (Ilardi & Craighead, 1999). Moreover, individuals with comorbid PDs and clinical depression exhibited higher levels of dysfunctional attitudes, operationalized as DAS scores, than do depressed patients without PDs (Evans & Craighead, 1995). These results lend additional empirical support to the conclusion that individuals manifesting PDs engage in more distorted thinking than controls or Axis I patients without PDs. Moreover, the cognitive distortions of Axis II patients are trait-like, because they are stable and fail to remit when Axis I conditions abate. Such dysfunctional cognitive style may carry the prediction of leaving them more vulnerable to future episodes of Axis I disorders (Ilardi & Craighead, 1999; Millon, 1994).
DSM-III (APA, 1980) originally delineated PDs along a separate axis to encourage the consideration of enduring characterological problems in the context of comorbid and more immediate mood, anxiety, and psychotic disorders (Frances, 1980; Spitzer, Williams, & Skodol, 1980). Although distinguishing PDs from other clinical syndromes diagnostically can be useful and valid, the demarcation often remains problematic and illusory whether or not diagnoses are placed on separate axes (Widiger & Shea, 1991).

Cognitive patterns exhibited in PDs (Axis II) differ from so-called clinical disorders on Axis I in a number of interesting ways. First, in Axis I conditions, such as depressive, anxiety, and psychotic disorders, the frequency and intensity of dysfunctional automatic thoughts are expected to subside as the Axis I syndrome abates. Axis I conditions are expected to be more episodic, meaning that patients typically return to premorbid levels of cognitive function as symptoms remit. Conversely, dysfunctional beliefs and distorted thinking patterns exhibited in PDs are more systematically “built into the ‘normal’ cognitive organization” and therefore more persistent and less amenable to change (Beck & Freeman, 1990, p. 58). Thus, if PDs originate in adolescence or early adulthood and are, by definition, pervasive and inflexible, then one might expect the dysfunctional beliefs and associated cognitive distortions to be more chronic in PD patients. An additional clinical problem arises from the fact that Axis II patients are more prone to “resistance” in the form of treatment nonadherence or “noncollaboration” (Beck & Freeman, 1990, p. 67).

This noncollaboration may stem from lack of motivation, secondary gain, rigidity of beliefs and behavior, vague or unrealistic treatment goals, and/or fears of the effects of change. All of these obstacles to change can be maintained, reinforced, and exacerbated by cognitive distortions (Beck & Freeman, 1990; Beck et al., 2004). Accordingly, correctly identifying and
treatment of cognitive distortions may illuminate underlying maladaptive beliefs, facilitate
treatment effectiveness, improve patient level of functioning, and ameliorate distress for
individuals with recalcitrant Axis II conditions.

Distorted cognitive style also has been associated with aggressive behavior, such as
cconduct disorder, reactive aggression, and commission of violent crimes in a sample of highly
aggressive juvenile offenders (Dodge & Newman, 1981; Dodge, Price, Bachorowski, &
Newman, 1990). To compound matters, early aggressive behavior, associated with cognitive
distortions, has been found to be a developmental precursor of later drug use (Brook, Whiteman,

There is also empirical support for the association between cognitive distortions and a
number of other troubling social and clinical conditions, including sexual assault (Baumeister,
Catanese, & Wallace, 2002), pathological gambling (Steenbergh, Meyers, May, & Whelan,
2002), adolescent anxiety and depressive disorders (Kendall, Kortlander, & Brady, 1992),
violence and anger in marital relationships (Ekhardt, Barbour, & Davison, 1998), and adolescent
depression and anxiety (Kolko, Brent, Baugher, Bridge, Birmaher, 2000).

Moreover, there is evidence of a relationship between comorbidity and cognitive
distortions. For example, Najavits, Gotthardt, Weiss, & Epstein (2004) recently demonstrated the
fact that individuals diagnosable with a dual Axis I diagnosis (PTSD and substance use
disorders) had a significantly greater tendency to engage in 10 out of 20 cognitive distortions, as
measured by the Cognitive Distortion Scale, than did individuals who only met criteria for one
Axis I diagnosis (PTSD).

Thus, consistent with the cognitive model, dysfunctional beliefs and their associated cognitive
distortions appear to be a unifying feature of psychological disorders, regardless of axis
taxonomy or biopsychosocial manifestations. Yet it is only recently that a single measure was developed to quantify the frequency of specific cognitive distortions independent of diagnosis (Yurica, 2002; Yurica & DiTomasso, 2002).

Cognitive distortions serve a pivotal role in the maintenance of emotional disorders (Beck et al., 1979; Beck, Wright, & Newman, 1993; Ellis & Grieger, 1977) and PDs (Beck & Freeman, 1990; Beck et al., 2004). Cognitive distortions can become habitual patterns of thinking that are evoked by certain stimuli and are supported by underlying intermediate beliefs composed of conditional assumptions, beliefs and rules (Beck, 1996). At the foundation of these dysfunctional cognitions are maladaptive core beliefs. These core beliefs are related to the most vulnerable aspects of an individual’s self-concept (e.g., I am unlovable, helpless, worthless, vulnerable, or incompetent) and maladaptive views of others (e.g., People are rejecting, demeaning, or hostile) (Beck, 1996). Cognitive distortions may also prevent reality testing of thoughts, thus maintaining the entire dysfunctional system of cognition, emotion, and behavior. When core beliefs are activated, as in times of psychological stress, cognitive distortions may become increasingly prominent and severe (Beck & Weishaar, 1989).

According to the cognitive model of psychopathology, CT “…techniques are designed to identify, reality-test and correct underlying distorted conceptualizations and the dysfunctional core beliefs (schemas) underlying those cognitions.” (Beck et al., 1979, p. 43). Thus, CT seeks to reduce cognitive distortions by promoting more accurate thinking.

Consequently, if cognitive distortion occupies such a central role in the cognitive model and patients present with a myriad of psychological disorders and permutations of comorbidites, then it would behoove therapists to use the most accurate means to assess the presence and severity
these cognitive distortions. This illustrates the need for a brief, portable, psychometrically sound instrument, such as the ICD (Yurica & DiTomasso, 2002).

For the assessment of psychological disorders, the Millon Clinical Multiaxial Inventory (MCMI—III; Millon, 1994) provides a comprehensive self-report questionnaire to assess personality and emotional adjustment according to DSM-IV criteria and Millon’s evolutionary theory of personality. In addition, the MCMI—III also provides a means to assess the validity of the test-taker’s responses. The instrument has also demonstrated good reliability and validity (Groth-Marnat, 1999).

Rationale for the Study

The influence that cognition exerts on emotion and behavior has been postulated since the beginning of classical civilization. Similarly, CT is based on the principle that human emotion and behavior are heavily influenced by cognition (e.g., Beck, 1976). Thus, according to cognitive theory, clinical disorders (e.g., Beck, 1976) and personality pathology (Beck & Freeman, 1990; Beck et al, 2004) should correlate with distorted cognition.

When Beck originally conceptualized depression as a “thinking disorder” in 1964 (p.13); he defined it as a disorder in which individuals viewed the world in a subjective manner largely determined by idiosyncratic cognitions. Consistent with Bartlett (1932) and Piaget’s vocabulary (1947/1950) and Kelly’s (1955) cognitive constructs, Beck further postulated that the activation of particular schemas were fundamental to cognitive, affective, and behavioral symptoms found in various psychological disorders (Beck, 1964, 1976; 1996; Beck, Emery, & Greenberg, 1985; Beck & Freeman, 1990; Beck, Wright, Newman, & Liesse, 1985).
Yurica & DiTomasso, 2002 provide the latest and most comprehensive psychometric self-report instrument for measuring cognitive distortions in an adult clinical population. The ICD is a 69-item self-report inventory designed to measure distorted cognitions in an outpatient clinical population and in normal controls. The instrument consists of single sentence items answered on a five-point Likert scale (Likert, 1932). The ICD provides scores on 11 factors/cognitive distortions and a total score reflecting the total frequency of cognitive distortion. Possible scores range from 69 to 345.

Yurica & DiTomasso (2001) designed the ICD explicitly to validate theorized cognitive distortions (Beck et al., 1979; Burns, 1980, 1999; Freeman & DeWolf, 1992; Freeman & Oster, 1999). However, of the original theorized cognitive distortions, factor analysis revealed 11 fundamental factors that closely resembled 10 theory-derived cognitive distortion subscales (Externalization of Self-Worth, Fortune-Telling, Magnification, Labeling, Perfectionism, Comparison to Others, Emotional Reasoning, Arbitrary Inference/Jumping to Conclusion, Minimization, Mind-Reading), in addition to one new cognitive distortion (Emotional Reasoning and Decision-Making).

Despite convincing theoretical and empirical evidence for the fundamental role of cognitive distortions in both the cognitive model and cognitive-behavioral therapies, there has been surprisingly little effort to quantify objectively the frequency with which these cognitive events occur. In fact, to date, only one instrument, the ICD (Yurica & DiTomasso, 2002), has been empirically validated via factor-analysis of the theoretical cognitive distortions with a clinical sample of heterogeneous outpatient mental health patients to test the frequency of these particular cognitive distortions (Yurica, 2002). Thus, this study endeavored to further validate the ICD and to expand the utility of this promising instrument into specific Axis I conditions.
and, beyond that, into the Axis II domain by correlating cognitive distortions (Total ICD scores) with psychological disorders (MCMI-III subscale scores).

The Purpose of the Study

This study sought to determine the relationship between the frequency of cognitive distortions and the number and severity of psychological disorders across Axis I and Axis II. Further, the study endeavored to further determine the validity and reliability of the ICD, a promising new self-report measure of cognitive distortions, by correlating this instrument with clinical diagnoses as determined by the MCMI-III, a widely accepted measure of psychological disorders. Providing further validation for the ICD, a brief, portable, and objective measure of these key cognitive processes should be beneficial to both research and practice in the following ways:

1. Accurately identifying specific patterns of cognitive distortions early during the course of treatment might assist the clinician to target more efficiently dysfunctional thought patterns that maintain and exacerbate social and psychological problems. It has been shown that treatment occurring earlier in the course of psychological disorders correlates with a number of therapeutic benefits, including positive treatment outcome, fewer office visits to physicians, and reduced health care costs (Bruns, 1998; Kaplan, 2000). Thus, using the ICD for early identification of cognitive distortions might allow the therapist and patient to illuminate collaboratively and more quickly the underlying secondary beliefs and schemas which maintain those same cognitive distortions.

2. An instrument that allows for regular assessment of cognitive distortions throughout treatment, such as the ICD, can provide an objective measure of progress, guiding treatment
planning because cognitive distortions have been shown to correlate with a number of Axis I and Axis II disorders (e.g., Beck & Freeman, 1990; Beck, Ward, Mendelson, Mock, & Erdbaugh, 196; Hollon & Kendall, 1980; Ross, Gottfredson, Christensen, & Weaver, 1986).

3. The instrument could facilitate psychoeducational processes regarding patients’ particular patterns of cognitive distortions, as well as the cognitive and behavioral skills explicitly targeting those distortions (Beck & Freeman, 1990).

4. There may be an emergence of characteristic patterns of distortions that delineate particular Axis I versus Axis II conditions. If the ICD supports this difference, its use may increase diagnostic accuracy, which may, in turn, lead to more effective treatment selection.

5. Demonstrating a correlation between the amelioration of cognitive distortions and the improvement of clinical symptoms for Axis I and Axis II conditions would lend further empirical support to the cognitive model of psychological disorders on both axes.

6. In a review of 136 research studies, Grove and Meehl, (1996) determined that empirically based personality assessment instruments are consistently equal to or superior to less-structured clinical interview methods for increasing the efficiency of the assessment process, for understanding patients, establishing rapport, formulating an accurate diagnosis, for developing insight, developing optimum empirically guided treatment planning, and for predicting the course of treatment (Costa & McCrae, 1992). Consequently, a brief self-report measure administered early in the treatment process might also lessen the burden on the psychological and medical communities by reducing the course of treatment and, by extension, healthcare costs.

7. The ICD has been validated only in an anxious and depressed sample. This study also sought to further expand the utility of the ICD beyond the evaluation of anxiety and
depression (Yurica, 2002) for use with additional Axis I and Axis II conditions. Additionally, it is hoped that a sufficiently validated ICD will allow for greater flexibility in empirical research by providing an additional assessment tool for the design and standardization of empirical procedure, which can be employed to measure pathology and progress for a broader range of psychological disorders, as well as aiding in the replication of empirical research. In addition, the ICD should also provide researchers and clinicians with an elegant tool to gauge quickly and accurately gauge the severity of pathology and aid in treatment planning.

8. Psychometrically, the goals of the study are to a) evaluate the construct validity of the ICD in a sample of Axis I and Axis II patients, b) determine the relationship between the ICD with specific Axis I and II disorders, c) establish the relationship between the ICD and the MCMI—III, a well-established, multidimensional, valid and reliable measure of Axis I and Axis II conditions, and d) further confirm the internal consistency of ICD content by confirming the acceptable alpha coefficient levels originally found by Yurica (2002).
Research Hypotheses

The study included eight research hypotheses. Table 2 presents a summary of hypotheses, rationale for individual hypotheses, and respective operational definitions.

Table 2

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Rationale</th>
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<tr>
<td>H₁: Individuals with a greater number of diagnosable Axis I clinical disorders and/or Axis II PDs will report a higher frequency of cognitive distortions than will individuals with fewer diagnosable psychological disorders or who are otherwise free of diagnosable psychological disorders.</td>
<td>If frequency of cognitive distortion correlates with the manifestation of clinical and personality disorders, then individuals experiencing more frequent cognitive distortions should manifest a greater number of psychological disorders.</td>
<td>The number of significant clinical disorder and personality disorder scales $r$ Total ICD scores</td>
</tr>
<tr>
<td>H₂: The number of PDs for which an individual may be diagnosed will positively correlate with the reported frequency of cognitive distortions.</td>
<td>If frequency of cognitive distortion correlates with the manifestation of personality disorders, then individuals experiencing more frequent cognitive distortions should manifest a greater number of personality disorders.</td>
<td>The number of significant MCMI—III Clinical Personality Pattern scale scores and/or Severe Personality Pathology scale scores $r$ Total ICD scores</td>
</tr>
<tr>
<td>H₃: The number of Axis I clinical syndromes for which an individual can be diagnosed will positively correlate with a person’s reported frequency of cognitive distortion.</td>
<td>If frequency of cognitive distortion correlates with the manifestation of clinical syndromes, then individuals experiencing more frequent cognitive distortions should manifest a greater number of clinical syndromes.</td>
<td>The number of significant MCMI-III Clinical Syndromes and/or Severe Clinical Syndromes $r$ Total ICD scores</td>
</tr>
<tr>
<td>H₄: Individuals with a greater number of comorbid Axis I and Axis II disorders will report more frequent cognitive distortions than</td>
<td>Individuals with comorbid Axis I and Axis II conditions engage in more frequent cognitive distortions than</td>
<td>The number of significant MCMI-III Clinical Syndromes and/or Severe Clinical Syndromes $r$ Total ICD</td>
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distortion than will individuals meeting criteria for only one Axis, that is either personality disorder(s) or for clinical syndrome(s).

H5: The severity of Axis I conditions will positively correlate with the reported frequency of cognitive distortions.

H6: The severity of personality disorders will positively correlate with the reported frequency of cognitive distortions.

H7: The total severity of psychological dysfunction, independent of whether the diagnoses occur on Axis I or Axis II, will positively correlate with the reported frequency of cognitive distortions.

H8: There will be a positive correlation between reported cognitive distortions and each clinical diagnosis for which an individual tests positive.

Note: Psychological disorders will be operationalized as MCMI—III scale scores, whereas cognitive distortions will be operationalized as Total ICD scores. Individuals must score at least BR 75 or greater for inclusion on a minimum of one MCMI—III personality or clinical disorder scales.

Hypothesis 1: Individuals with a greater number of diagnosable Axis I clinical disorders and/or Axis II PDs will report a higher frequency of cognitive distortions than will individuals with fewer diagnosable psychological disorders or who are otherwise free of diagnosable scores.
psychological disorders. Diagnosable disorders will be operationalized as a BR of 75 or greater on any scale in the following MCMI-III categories: Clinical Syndromes (Axis I), Severe Clinical Syndromes (Axis I), Clinical Personality Patterns (Axis II), Severe Personality Pathology (Axis II). This will yield a score of between 0 for no disorders to 24 if all personality scales and clinical disorder scales are scored BR 75 or greater.

Cognitive distortion will be operationalized as Total ICD scores. Participants will be judged as manifesting a “diagnosable” disorder by meeting a threshold of BR 75 or greater on one or more scales of either Axis I or Axis II pathology. Although an MCMI—III score of BR 85 indicates the prominence of a clinical syndrome or the presence of a personality disorder (Millon, 1994, Millon & Davis, 1996), a BR of 75 indicates the presence of a style or syndrome. It should be noted that this criterion applies to all of this study’s hypotheses (See Table 2 for summary of hypotheses, rationale, and formulae.)

Hypothesis 2: The number of PDs for which an individual may be diagnosed will positively correlate with the reported frequency of cognitive distortions. The number of PDs will be operationalized as the sum of all significant MCMI-III Clinical Personality Pattern scales and Severe Personality Pathology scale that score BR 75 or greater. This will yield a score of between 0 for no PDs to 14 if all personality scales scored BR 75 or greater. Cognitive distortions will be operationalized as Total ICD scores.

Rationale for H1 and H2: According to Millon et al. (1997, p. 124), “the greater the number of scales elevated above BR 75, the greater the personality pathology” and the higher the BR scale score elevation above BR 75, the more severe the disturbance. Thus, the number of significant MCMI-III Clinical Personality Pattern and/or Severe Personality Pathology scales should correlate with total pathology on Axis II, as measured by the ICD. Although all MCMI-
III BR scores above 75 are interpretable, a score of BR 75 is expected to indicate the presence of a clinically significant personality “style” or “syndrome”; however, BR 85 is indicative of symptoms sufficient to warrant a diagnosis of PD (Millon & Davis, 1996, p. 120).

Hypothesis 3: The number of Axis I clinical syndromes for which an individual can be diagnosed will positively correlate with a person’s reported frequency of cognitive distortion. This means that an individuals who meet criteria for only one Axis I diagnosis is expected to engage in less cognitive distortion than individuals with a greater number of clinical syndromes. These effects are expected to be incremental, with the tendency to engage in cognitive distortion increasing as the number of Axis I clinical syndromes increases.

The number of Axis I clinical syndromes will be operationalized as the total number of MCMI-III Clinical Syndromes (Axis I), Severe Clinical Syndromes (Axis I) that are elevated above BR 75. This will yield a potential score of 0 for no diagnosis to 10, if an individual scores equal to or greater than BR 75 for all of the MCMI-III Axis I scales.

Hypothesis 4: Individuals with a greater number of comorbid Axis I and Axis II disorders will report more frequent cognitive distortion than will individuals meeting criteria for only one Axis; that is it meets the criteria either for personality disorder(s) or clinical syndrome(s). In other words, individuals meeting diagnostic criteria for both Axis I and Axis II conditions will engage in more cognitive distortions than an individual who is diagnosable only on Axis I or Axis II. Additionally, these effects are predicted to be incremental, increasing as the number of disorders increases.

The number of Axis I and Axis II disorders will be operationalized as above, with a possible range of scores of 0 for no diagnosis to 24 for an individual scoring greater than or equal to BR 75 for all of the Axis II scales (n=14) and Axis I scales (n=10).
Hypothesis 5: The severity of Axis I conditions will positively correlate with the reported frequency of cognitive distortions. The severity of Axis I conditions will be operationalized as MCMI-III scale scores of BR 75 or greater on for any of the Clinical Syndromes and/or Severe Clinical Syndrome scales. Cognitive distortions will be operationalized as Total ICD scores.

The severity of Axis I conditions will be quantified as the sum of all BR points for Clinical Syndromes and Severe Clinical Syndrome scale scores of BR 75 or greater for any of the Axis I scales. A ceiling of 115 is imposed for a valid score (Millon & Davis, 1996). The scope of possible Axis I severity scores will range from 0 to a possible score of 400 for an individual scoring 115 for all 10 scales. For example, an individual scoring BR 95 for scale A and 85 for scale D would yield an Axis I severity rating of 20 +10 = 30.

Rationale for H3, H4, and H5: Axis I clinical syndromes may appear independent of personality pathology. (Millon & Davis, 1996). Empirical evidence lends strong support to the cognitive model of emotional disorders for various Axis I clinical syndromes (Beck, 1967, 1976), which posits that schema-driven “cognitive errors” powerfully influence affect and behavior (Beck et al., 1979, p. 10). Perhaps at the most fundamental level, one of the principal goals of CT is to reduce these characteristic patterns of distorted thinking. Even schema-focused approaches ultimately aim to replace maladaptive core beliefs with more adaptive cognitions, which maintain, and are perpetuated by, one’s cognitive distortions (Young, 1999). Thus, it is expected that the frequency of cognitive distortion will correlate with the severity and number of psychological disorders.

Hypothesis 6. The severity of PDs will positively correlate with the reported frequency of cognitive distortions. Axis II personality severity will be operationalized as the sum of all MCMI-III Clinical Personality Pattern and Severe Personality Pathology scales scores of BR 75
or greater, indicating a threshold of BR 75 for significance. The MCMI—III imposes a ceiling of BR 115 (Millon & Davis, 1996). Thus, the scope of possible Axis II severity scores will range from 0 to a possible score of 560 for an individual scoring the maximum 115 for all 14 Axis II pathology scales. Cognitive distortions will be operationalized as Total ICD scores.

Rationale for H6: In a recent study conducted with a combined sample of clinical and nonclinical populations, O’Connor & Dyce (2001) demonstrated empirically that the MCMI—III was able to differentiate the individuals with PDs from those individuals failing to meet Axis II diagnostic criteria. Normal and disordered personalities were found to coexist in a variety of regions of the multivariate space based on the 5-factor model (FFM) of personality (Widiger, 2000). Examination of the interpersonal dimensions chart (Figure 1) reveals that within regions, the profiles of normal and disordered personalities were very similar in characteristic configuration or vector but notably different in vector length. Moreover, this difference can be detected by the MCMI-III. Those with PDs appear to be “out there” in inner experience, interpersonal behavior, and in this case, geometric configuration. Significantly, length of vector predicted the presence of Axis II pathology, but it failed to predict any specific personality disorder. Consequently, it is predicted that the severity of cognitive distortion will predict the presence and severity of Axis II conditions. Although cognitive distortion may be able to predict the extremity of the vector and presence of personality disorder(s), it is not predicted to be able to predict the direction of the vector, that is, specific personality disorder.

Personality-disordered individuals tended to be located in the perimeters or outer regions of the FFM space, as indicated by their longer vector lengths; this is indicative of the fact that the presence and severity of a personality disorder was manifested in a difference in the quantity, rather than the quality of four of the five FFM dimensions: Neuroticism, extraversion,
agreeableness, and conscientiousness, which were differentially more extreme in individuals with PDs. Specifically, those reaching the threshold for significance on MCMI-III, with BR scores equal to or greater than BR 75 or BR 85, exhibited significantly more extremity and rigidity on these dimensions.

Hypothesis 7. The total severity of psychological dysfunction, independent of whether diagnoses occur on Axis I or Axis II, will positively correlate with reported frequency of cognitive distortions.

Total severity of psychological dysfunction scores will be operationalized as the sum of all relevant MCMI-III scales of BR 75 or greater within the following categories: Clinical Syndromes (Axis I), Severe Clinical Syndromes (Axis I), Clinical Personality Patterns (Axis II), Severe Personality Pathology (Axis II). Cognitive distortions will be operationalized as Total ICD scores. This indicates a threshold for significance of BR 75. The scope of possible total severity scores will range from 0 to a possible score of 960 for an individual scoring 115 for all 24 clinical scales.

Rationale for H7: Millon & Davis, (1997) conceptualize Axis I clinical syndromes as “extensions or distortions of the patient’s basic personality pattern... waxing and waning over time depending on the impact of stressful situations” (p. 22).

The multiaxial model posits an interaction between Axis I and Axis II symptomatology in which personality is defined as the “…overall capacity to perceive and to cope with our psychosocial world…” (Millon & Davis, 1996, p. 120). Personality is further conceptualized as analogous to an immune system, protecting the individual from the vicissitudes of external stressors. However, Axis I symptoms may occur because the PD patients dysfunctional “immune systems” fails to protect the individual from stress. When this occurs, Axis I clinical syndromes
arise in addition to the preexisting PD symptoms. This increases the total severity of the individual’s dysfunction (Millon & Davis, 1996). In other words, all other things being equal, an individual meeting the diagnostic criteria for both Major Depressive Disorder and Dependent Personality Disorder is expected to evince more impairment and/or distress than another person meeting diagnostic criteria for only one of these axes.

Comorbid diagnoses across axes may lead to a pattern in which cognitive distortion can constrict behavior in a fashion that may actually exacerbate existing difficulties, leading to vicious circles of cognitive distortion, distress, and interpersonal impairment. When this occurs, one’s cognition may be further impaired by the resulting Axis I clinical syndromes. Prolonged Axis I symptoms can, in turn, exacerbate personality dysfunction.

Because of this reciprocal interaction between Axis I and Axis II (Millon et al., 1996; Millon & Davis, 1996), it is expected that individuals with greater total pathology, independent of whether this pathology arises from Axis I or Axis II, will experience more frequent cognitive distortions. This explains why Millon & Davis, (1997) posit the idea that the presence of Axis I pathology supports the presence of personality pathology.

Finally, Beck (1976) and Lefebvre (1981) suggest that a total distortion score might be of more practical value than differentiating individual categories of distortions. Similarly, the DAS (Weisman & Beck, 1978) was designed to yield a single total score of dysfunctional attitudes. Consequently, this study will correlate ICD total scores with the number of diagnosable clinical disorders, with the severity of total psychological dysfunction, and with various individual disorders—all of which will be determined by the MCMI—III scale scores.

Hypothesis 8: There will be a positive correlation between reported cognitive distortions and individual clinical diagnosis scores for which an individual tests positive. Cognitive distortions
will be operationalized as ICD scores; a positive diagnosis will be operationalized as BR scores greater than 75 on any MCMI-III scale on either Axis I or Axis II. The 24 MCMI-III BR scale scores plus a single ICD score will yield 25 x 25 multi-correlational matrix correlating cognitive distortions with individual disorders.

Rationale for H8: According to the cognitive model, cognitive distortions will positively correlate with psychological disorders as assessed by the MCMI-III on either Axis I or Axis II. However, it is not expected that any differential pattern of frequency of cognitive distortion to specific disorder will emerge.

Definition of Terms

Diagnoses: Operationally defined as a score of 75 or greater on any of the MCMI-III subscales.

Axis II Personality Disorder: Operationally defined as a score of 75 or greater on any MCMI-III Clinical Personality Pattern Scale(s) or any Severe Personality Pathology Scale(s).

Axis I Clinical Syndrome(s): Operationally defined as a score of 75 or greater on any MCMI-III Clinical Syndrome Scale(s) or Severe Clinical Syndrome Scale(s).

The 11 theoretical factors or cognitive distortions, as defined verbatim by Yurica (2002, p. 60), are composed of the following:

Cognitive Distortions:

1. Externalization of Self-Worth: Refers to the development and maintenance of self-worth based almost exclusively on how the external world views oneself (Freeman & DeWolf, 1992; Freeman & Oster, 1999).
2. **Fortune-Telling**: The process of foretelling or predicting a future event or events and believing that this prediction is absolutely true for oneself (Burns, 1980, 1989, 1999).

3. **Magnification**: The tendency to exaggerate or magnify either the positive or negative consequences of some personal trait, event, or circumstance (Burns, 1980, 1989, 1999).


5. **Perfectionism**: Refers to a constant striving to live up to some internal or external representation of perfection without examining the evidence for the reasonableness of these perfect standards, often to avoid the subjective experience of failure (Freeman & DeWolf, 1990; Freeman & Dewolf, 1992; Freeman & Oster, 1999).

6. **Comparison to Others**: The tendency to compare oneself to others whereby the outcome typically results in concluding that they are inferior or worse off than others (Freeman & DeWolf, 1992; Freeman & Oster, 1999).

7. **Emotional Reasoning**: Refers to the predominant use of an emotional state to form conclusions about oneself, others, or situations (Beck et al., 1979; Burns, 1980, 1989, 1999).

8. **Arbitrary Inference/Jumping to Conclusion**: Refers to the process of drawing a negative conclusion in the absence of specific evidence to support that conclusion (Beck et al., 1979; Burns, 1980, 1989, 1999).

9. **Minimization**: Refers to the process of minimizing or discounting the importance of some event, trait, or circumstance (Burns, 1980, 1989, 1999).

10. **Mind-Reading**: Refers to one’s arbitrary conclusion that someone is reacting negatively, or thinking negatively towards him or her, without specific evidence to support that conclusion (Burns, 1980, 1989, 1999).
11. Emotional Reasoning and Decision-Making: The tendency to rely on emotions to make decisions (Yurica, 2002).
CHAPTER 3

METHODOLOGY

Participants

A total of 168 adult outpatients presenting at the Center for Brief Therapy at the Philadelphia College of Osteopathic Medicine for psychological treatment or evaluation were offered the opportunity to participate in the present study of cognition. Participants were also recruited from various patients in the care of clinicians in private practice in the Philadelphia area.

Participation in this project was voluntary for all subjects and they retained the right to withdraw at any time without explanation. All participants remained completely anonymous. No identifying information was ever collected on any subjects, other than basic demographic data.

Clinicians presented the participants with a packet containing the following:

1. Letter of informed consent.
2. Brief Demographic Questionnaire
3. Millon Clinical Multiaxial Inventory-III
4. Inventory of Cognitive Distortions
5. A stamped, self addressed return envelope to the investigators

Completion time was estimated to be no more than 50 minutes.
**Inclusion Criteria**

Participants were required to meet the following conditions to be included in this study. Individuals were between 18 to 88 years of age (Millon & Davis, 1996) and obtained a score of BR 75 or greater on at least one MCMI-III subscale on either Axis I or Axis II. Participants currently undergoing pharmacological care were included in the study and identified by a yes or no format on the Brief Information Sheet (BIS) to determine whether or not they were currently taking psychotropic medication (Yurica, 2002). Participants verified a minimum of an eighth grade education on the MCMI-III questionnaire sheet.

**Exclusion Criteria**

Participants younger than 18 or older than 88 years of age were excluded. Additionally excluded were participants who met diagnostic criteria for traumatic brain injury, mental retardation, pervasive developmental disorders, tic disorders, delirium, dementia, amnestic disorders, schizophrenia and other psychotic disorders (Yurica, 2002), or individuals who appeared to be intoxicated. These diagnoses were made by the treating clinician. Also excluded were participants who reported an educational level below eighth grade either to the clinician or on the MCMI-III.
**Participant Recruitment**

Participants were recruited from the Center for Brief Therapy, an outpatient mental healthcare clinic associated with the Philadelphia College of Osteopathic Medicine and from individual clinicians in private clinical practice. Study clinicians included therapists at the Master’s level, doctoral students, doctoral candidates, as well as licensed psychologists. All graduate-level therapists were supervised by an experienced licensed psychologist.

Participants were requested to review an Agreement to Participate in Research Study of Cognition form prior to participating in this study. They were then given a packet including the BIS, one copy of the ICD, and one copy of the MCMI—III. The anticipated time for completion of both instruments was approximately 50 minutes. Participation was completely voluntary and participants could have withdrawn at any time without explanation.

All participant data remained completely anonymous. Only demographic data, such as age, race, gender, and a yes/no response about current psychotropic medication use was retained. No other identifiable participant information was collected or stored.

**Research Design**

A correlational design was employed to compare the relationship between cognitive distortions, as measured by the ICD, and psychological disorders, operationalized as scores on the MCMI-III. Additionally, the study was intended to assess the psychometric properties of the ICD. A series of Pearson Product Moment Correlations was conducted to compare ICD scores of
those with significant clinical and/or PDs, as measured by the MCMI—III, versus those who failed to meet diagnostic criteria for any Axis I or Axis II condition.

Measures

The Million Clinical Multiaxial Inventory-Third Edition

Test materials consisted of the MCMI—III (Millon, 1994), the ICD (Yurica & DiTomasso, 2002), and a brief demographic questionnaire.

MCMI—III.

The MCMI—III (Millon, 1994) is a 175-item self-report test with a total of 27 scales. Estimated administration time is approximately 25 minutes. The test is divided into five sections with scales measuring both PDs and clinical syndromes comprising: (a) Modifying Indices (3 validity scales), (b) Clinical Personality Patterns (11 basic personality disorder scales on Axis II), (c) Severe Personality Pathology (3 severe personality disorder scales on Axis II), (d) Clinical Syndromes (7 moderate psychopathology scales on Axis I), and (e) Severe Syndromes (3 severe psychopathology scales on Axis I). The MCMI—III raw scores are translated into BR scores. The BR method of scoring is used on the MCMI—III rather than the more common normalized standard t-score transformations. The rationale for the use of BR scores is to assure that the proportion of individuals who score above each scale's cutoff point approximates, as closely as possible, the actual prevalence rates of the disorder in a clinical population. A BR score of 0 is the minimum, and a BR score of 115 corresponds to the maximum valid BR score for each scale.
A BR score of 60 corresponds to the median BR score for each scale in a psychiatric population (Millon, 1994; Millon & Davis, 1996).

**MCMI—III reliability.**

Millon & Davis (1997) reported that the MCMI—III has demonstrated acceptable psychometric properties. The instruments internal consistency, or the degree to which scale items intercorrelate, ranged from a low of Cronbach’s alpha of .66 for the Compulsive scale to a high of .90 for Major Depression.

**MCMI—III validity.**

The MCMI-III also demonstrated good concurrent validity with the Major Depression and Dysthymia scales correlating with the Beck Depression Inventory (Beck & Steer, 1987) .74 and .71, respectively (Millon & Davis, 1996). The State Trait Anxiety Inventory (STAI; Spielberger, 1983) correlated more highly with the Major Depression scale (.59) than the Anxiety scale, the MCMI—III; however, the Anxiety scale still correlated moderately with state (.55) and trait (.58) anxiety (Millon et al., 1997). Consequently, caution might be appropriate regarding discriminant validity as, for further example, the BDI also correlated .63 with the PTSD and .62 with the Thought Disorder scales (Millon & Davis, 1996).
Predictive validity.

The aggressive personality disorder scales and several of the neurotic scales correlated with future institutional violence in prison populations (Retzlaff, Stoner, & Kleinsasser, 2002).

Discriminant validity.

The MCMI—III has demonstrated both convergent and discriminant validity as a measure of sleep disturbance (Allen, Console, & Brethour, 2000).

The MCMI-III has also demonstrated high test-retest validity with a median for all scales of .91 (Millon & Davis, 1996).

The Inventory of Cognitive Distortions

The ICD, a 69-item self-report inventory, is composed of short sentences reflecting 11 factor-analyzed cognitive distortions. The ICD was designed for and validated with an adult clinical population with symptoms of anxiety and/or depression (Yurica, 2002). Items are scored on a five-point Likert (1932) scale ranging from 1 = Never to 5 = Always. Total possible ICD scores range from 69 to 345, with lower scores reflecting less frequency of cognitive distortions than higher scores. The instrument has attained satisfactory construct and content validity, with experts achieving 100% agreement that all inventory items reflected each specific distortion construct. Only items with 100% expert agreement were retained for final factor-analysis. The intent of the ICD is to provide a total score of cognitive distortion, with higher scores signifying
more severe patterns of distortion and employment of more types of distortion. The scale also yields subscale scores of distortion. Yurica (2002) demonstrated good psychometric properties for the ICD, as follows:

**ICD Psychometrics**

**ICD Reliability.**

The initial validation study found an impressive test-retest reliability with a test-retest reliability coefficient for total ICD scores of .998 (n = 28, p < .001).

**ICD validity.**

The ICD also demonstrated good concurrent validity, as Total ICD scores correlated significantly and positively with other widely accepted measures of psychopathology, such as dysfunctional attitudes, the DAS (r = .70, N = 159, p < .0001); depression, the BDI-II (r = .70, N = 161, p < .0001); and anxiety, the BAI (r = .59, N = 161, p < .0001). In the same study, Yurica (2002) also found impressive criterion validity because the Total ICD scores differentiated clinical outpatients from non-patient controls (F = 15.2, df = 169, p < .0001).

**Procedure**

The present study included a heterogeneous population of adult outpatients ranging in age from 18 to 88 years; these patients presented to the Center for Brief Therapy at the Philadelphia
College of Osteopathic Medicine or specified local clinicians for psychological treatment or evaluation. Excluded were those meeting diagnostic criteria for mental retardation, pervasive developmental disorders, amnestic disorders, schizophrenia or any of the other psychotic disorders, or those appearing to be intoxicated. Confirmation of inclusionary and exclusionary criteria was performed by the treating clinicians (study collaborators) and through analysis of the BIS and MCMI-III. Study collaborators included therapists at the Master’s level, doctoral students, doctoral candidates, as well as licensed psychologists. All graduate level therapists were supervised by experienced, licensed psychologists.

Placement of the instruments into packets varied randomly to control for sequence and order effects, with the MCMI—III preceding the ICD in only some cases (Kazdin, 1998). The random order for each packet will be determined by coin toss.

Participants were informed in writing about the purpose and procedures involved in the study. All participants had the right to withdraw from the study at any time without explanation. Participation in the study was completely voluntary. Descriptive data were gathered including age, sex, marital status, educational level, and a yes-no response as to current use of psychotropic medication. Participants were informed that their responses would remain anonymous and confidential.
CHAPTER 4
RESULTS

A correlational research design with a sample of a heterogeneous group of adult outpatients was used to ascertain the relationship between psychometric variables encompassed by the ICD (frequency of cognitive distortions) and the MCMI-III (psychological diagnoses). In addition, results were analyzed to test the psychometric properties of the ICD. Data gathered from these individuals comprised the entire sample used for statistical computation and analyses. Study collaborators recruited clients to volunteer from among their patients; the collaborators included practicing psychologists, counselors, practicum students or interns in the Greater Philadelphia area, recruited clients to volunteer from among their patients. Both study collaborators and the MCMI-III screened participants for a minimum of eight years of education.

All psychological outpatients were combined to form one outpatient sample for the purposes of this study. The sample (N = 168) included those meeting objective criteria for a clinical diagnosis either on Axis I and/or Axis II.

Diagnosis was operationally defined as a score of 75 or greater on any of the ten MCMI-III Axis I Clinical Syndrome Scales or any of the 14 Personality Scales. This provided objective clinical diagnosis on a widely accepted measure of psychopathology. A number of variables were analyzed, including participant demographics, diagnostic variables, frequency of cognitive distortions, and the intercorrelation of these factors.
Descriptive Statistics

Age

Participants ranged in age from 18 to 86 years of age. The mean age in both groups was 42.8 with a standard deviation of 18.1.

Gender

The gender distribution for the total sample (N = 168) consisted of 48 males (29.3%) and 116 females (70.7%).

Marital Status

Marital status was distributed in the total sample as 65 single (67.3%), 69 married (42.1%), and 29 (17.7%) endorsing “other”, the latter was further defined by the MCMI-III as separated, divorced, widowed, or cohabitating.
Use of Psychotropic Medication

Of the 154 participants responding, 114 (67.9%) reported not using psychotropic medication, whereas 39 (23.2%) reported current medication use.

Internal Consistency

Cronbach’s Alpha for the ICD scale was .97 for all ICD items, indicating good internal consistency and homogeneity of item content.

Relationship to Demographic Variables

The Relationship between the MCMI-III and the Total ICD Scores

Statistical Package for Social Sciences version 10.0 (SPSS 10.0) was used in the data analysis. A number of Pearson Product Moment Correlation Coefficients, one-tailed were gathered to test the relationship between the number (operationalized as the number MCMI-III subscale scores of 75 or greater) and severity (operationalized as the cumulative sum of MCMI-III BR scores of 75 or greater) of clinical syndrome(s) and/or personality disorder(s) on the one hand, and the total frequency of cognitive distortion on the other hand (hypotheses 1, 2, 3, 5, 6,
A one-way ANOVA was conducted to determine if there was a significant difference in Total ICD scores between individuals diagnosable on only one clinical axis versus those diagnosable with *comorbid* Axis I and Axis II disorders (hypothesis 4). Finally, a series of Pearson Product Moment Correlation Coefficients was also conducted to illustrate the relationship between the presence of specific Axis I and Axis II disorders on the one hand (operationalized as MCMI-III scores of 75 or greater on any subscale), and the frequency of cognitive distortions (operationalized as total ICD scores) on the other hand (hypothesis 8).

**Hypothesis 1**

It was hypothesized that the *number of Axis I and Axis II disorders* (MCMI-III BR scores of 75 or greater on any Axis I or Axis II scale) for which an individual met criteria would correlate with the total ICD score. The results demonstrated a significantly positive Pearson correlation coefficient ($r = .662, r^2 = .438, p < .001$, one-tailed) on this dimension. This illustrates a coefficient of determination, indicating that almost 44% of the variance in the number of Axis I and Axis II disorders for which an individual met diagnostic criteria was attributable to differences in Total ICD scores.

**Hypothesis 2**

It was hypothesized that the number of PDs for which an individual may be diagnosed (MCMI-III BR scores of 75 or greater on any Axis II scale) would positively correlate with the total ICD score. A significant and moderate Pearson correlation coefficient ($r = .563, r^2 = .312, p < .001$, one-tailed) was obtained on this variable. Consequently, it appeared that 31.2% of the variance in the number of Axis II disorders for which an individual met diagnostic criteria was attributable to the differences in Total ICD score.
Hypothesis 3

It was hypothesized that the number of Axis I clinical syndromes for which an individual could be diagnosed (MCMI-III BR scores of 75 or greater on any Axis I scale) would positively correlate with the total ICD score. Again, a significantly positive Pearson correlation coefficient \( r = .638, r^2 = .407, p < .001 \) was obtained, indicating that over 40% of the variance in the number Axis I disorders for which an individual met diagnostic criteria was attributable to the differences in Total ICD score.

Hypothesis 4

It was hypothesized that the number of *comorbid* Axis I and Axis II disorders (MCMI-III BR scores of 75 or greater on *both* Axis I and Axis II scales) would report more frequent cognitive distortion (greater total ICD scores) than will individuals meeting criteria for only one Axis, that is for either personality disorder(s) *or* clinical syndrome(s). One-way ANOVA results (see Table 3) demonstrated a significant difference between individuals diagnosable on only one clinical axis versus those diagnosable with *comorbid* Axis I and Axis II disorders, including total ICD scores (\( F = 74.778, df = 123, p < .001 \)). It should be noted that only five participants met diagnostic criteria for only Axis I without PD pathology, making comparison with that group superfluous.
Table 3

Analysis of Variance for Comorbid Axis I and Axis II Conditions

<table>
<thead>
<tr>
<th>Source</th>
<th>$Df$</th>
<th>$F$</th>
<th>MS</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>74.78</td>
<td>83333.3</td>
<td>.001</td>
</tr>
<tr>
<td>Within groups</td>
<td>122</td>
<td>1114.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Individuals with a larger number of comorbid Axis I and Axis II disorders experienced a significantly greater frequency of cognitive distortion than did those who met criteria for fewer comorbid conditions. (Participants meeting only Axis I criteria were excluded due to a small n ($n = 5$).

Hypothesis 5

It was hypothesized that the severity of Axis I conditions (the cumulative sum of MCMI-III BR scores of 75 or greater on Axis I scales) would positively correlate with total ICD scores. Pearson correlation results indicated that there was a significant, positive relationship between these variables ($r = .693$, $r^2 = .48$, $p < .001$, one-tailed). Thus, almost half of the variance in severity of Axis I syndromes was attributable to differences in total ICD scores.

Hypothesis 6

It was hypothesized that the severity of PDs (the cumulative sum of MCMI-III BR scores of 75 or greater on all Axis II scales) would positively correlate with total ICD scores. Once again, Pearson correlations indicated a highly significantly positive relationship on this dimension ($r = .757$, $r^2 = .573$, $p < .001$, one-tailed). In other words, 57 percent of the variance in severity of personality disturbance was attributable to differences in total ICD scores.
Hypothesis 7

It was hypothesized that the total severity of psychological dysfunction, independent of whether or not the diagnoses occurred on Axis I or Axis II (the cumulative sum of all MCMI-III BR scores of 75 or greater on all Axis I and Axis II scales), would positively correlate with total ICD scores. Again, results of Pearson correlations suggested a strong and highly significant relationship in this regard ($r = .748$, $r^2 = .56$, $p < .001$, one-tailed). This means that, once again, well over half of the variance in severity of psychological dysfunction, across clinical axes, was attributable to differences in total ICD scores.

Table 4 presents correlation coefficients for frequency of cognitive distortions in relation both to the severity and the number of disorders.

Table 4
Number and Severity of Psychological Disorders across Axis I and Axis II and the Relation to Total Frequency of Cognitive Distortion.

<table>
<thead>
<tr>
<th></th>
<th>Axis I</th>
<th>Axis II</th>
<th>Both (Axes I and II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Disorders</td>
<td>.638**</td>
<td>.563**</td>
<td>.662**</td>
</tr>
<tr>
<td>Severity of Disorders</td>
<td>.693**</td>
<td>.757**</td>
<td>.748**</td>
</tr>
</tbody>
</table>
Note. Pearson coefficients, when comparing the total frequency of cognitive distortion either with the number or the severity of psychological disorder, significant correlations were found for both Axis I and Axis II disorders, severally and when comorbid. **p < .001.

Hypothesis 8

A series of Point-Biserial Correlations were conducted to determine the validity of the hypothesized positive correlation between individual clinical diagnostic scores on either Axis I and/or Axis II for which an individual tested positive (MCMI-III BR scores of 75 or greater on any Axis I and/or Axis II scale[s]) and total ICD scores. The diagnostic variables were dichotomous, meaning that individuals either met or did not meet operational criteria for each specific disorder. For example, a participant with a score of 87 on schizoid and 64 on narcissistic met criteria for the former, but not the latter. This positive relationship was confirmed by multiple, significant Pearson correlations for most Axis I and Axis II disorder, on the one hand, and Total ICD scores, on the other hand (see Table 5). However, a number of exceptions were discovered.

First, although correlated in a positive direction, both bipolar disorder (r = .104, p < .109, one-tailed) and drug dependence (r = .063, p < .228, one-tailed) failed to reach statistical significance. Conversely, three Axis II disorders were significantly but negatively correlated with frequency of cognitive distortion, specifically, narcissistic (NPD), histrionic (HPD), and compulsive PDs (OCPD) which correlated negatively with the total ICD scores, as follows: NPD (r = -.214, r² = .046, p < .05, one-tailed); HPD (r = -.266, r² = .071, p < .001, one-tailed); and OCPD (r = -.343, r² = .118, p < .001).
Table 5

The Relationship between Frequency of Cognitive Distortion (Total ICD score) and Individual Psychological Disorders.

<table>
<thead>
<tr>
<th>Axis II</th>
<th>Axis I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizoid</td>
<td>.233**</td>
</tr>
<tr>
<td>Avoidant</td>
<td>.494***</td>
</tr>
<tr>
<td>Depressive</td>
<td>.491***</td>
</tr>
<tr>
<td>Dependent</td>
<td>.518***</td>
</tr>
<tr>
<td>Histrionic</td>
<td>-266***</td>
</tr>
<tr>
<td>Narcissistic</td>
<td>-.214**</td>
</tr>
<tr>
<td>Antisocial</td>
<td>.188*</td>
</tr>
<tr>
<td>Aggressive/Sadistic</td>
<td>.154*</td>
</tr>
<tr>
<td>Compulsive</td>
<td>-.343***</td>
</tr>
<tr>
<td>Passive-Aggressive</td>
<td>.437***</td>
</tr>
<tr>
<td>Self-Defeating</td>
<td>.513**</td>
</tr>
<tr>
<td>Shizotypal</td>
<td>.348***</td>
</tr>
<tr>
<td>Borderline</td>
<td>.384***</td>
</tr>
<tr>
<td>Paranoid</td>
<td>.354***</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.613***</td>
</tr>
<tr>
<td>Somatoform</td>
<td>.247*</td>
</tr>
<tr>
<td>Bipolar</td>
<td>.104</td>
</tr>
<tr>
<td>Dysthymia</td>
<td>.436***</td>
</tr>
<tr>
<td>Alcohol Dependence</td>
<td>-</td>
</tr>
<tr>
<td>Drug Dependence</td>
<td>.063</td>
</tr>
<tr>
<td>PTSD</td>
<td>.300***</td>
</tr>
<tr>
<td>Thought Disorder</td>
<td>.266***</td>
</tr>
<tr>
<td>Major Depression</td>
<td>.344</td>
</tr>
<tr>
<td>Delusional Disorder</td>
<td>.334***</td>
</tr>
</tbody>
</table>

Note. Most Axis I and Axis II conditions were positively and significantly correlated with frequency of cognitive distortion. Exceptions included bipolar disorder, drug dependence, NPD, HPD, and OCPD. *p < .05, **p < .01, ***p < .001.
CHAPTER 5
DISCUSSION

The purpose of this study was twofold: First, the study sought to determine whether or not the frequency of cognitive distortions correlated with the number and severity of psychological disorders across Axis I and Axis II. Second, the study endeavored to further assess the validity and reliability of a promising new self-report measure of cognitive distortions by correlating the ICD with clinical diagnoses as determined by the MCMI-III in a heterogeneous adult clinical outpatient sample. Significant positive findings indicate that these goals were achieved. This chapter summarizes the study, expands on relevant findings and discusses the implications of the results in light of the existing literature. Study limitations and directions for future research are also explored.

Cronbach’s analysis of all ICD items indicated strong homogeneity of item content (Cronbach’s Alpha = .97). This finding indicates that 97% of Total ICD scores was due to shared variance in the concept being measured, that is, cognitive distortions. Such internal consistency provides valid support for using the Total ICD scores as a measure of the frequency of cognitive distortion. In this manner, the study examined the relationship between the frequency of cognitive distortions and the number and/or severity of psychological disorders.

Participants completed comprehensive assessment instruments for Axis I and II disorders, as well as cognitive distortions; this was done to evaluate the impact of cognitive distortions on co-occurring disorders. Specifically, the MCMI-III and the ICD were measured to determine the relationship between cognitive distortion and the number and severity of psychological disorders along Axis I and Axis II. Results supported all of the eight initial hypotheses.
Demographic Characteristics

Study participants included an ethnically diverse sample of clinical outpatients with a wide variety of clinical diagnoses across the entire adult age span. Participants ranged in age from 18 to 86 years of age. The mean age was 42.8 years with a standard deviation of 18.1.

The gender distribution for the total sample (N = 168) consisted of 48 males (29.3%) and 116 females (70.7%). Marital status was distributed in the total sample as 65 single (39.9%), 69 married (42.3%), and 29 (17.8%) separated, divorced, widowed, or cohabitating. Of the 154 participants responding, 114 (67.9%) reported not using psychotropic medication, whereas 39 (23.2%) reported current medication use.

Major Findings

Presence of Psychopathology

As was hypothesized, individuals meeting criteria for any diagnosis (BR of 75 or greater on any MCMI-III Axis scale[s]), on Axis I clinical disorders or on Axis II PDs, reported a higher frequency of cognitive distortions than those who were free of diagnosable psychological disorders. Moreover, individuals meeting criteria for a greater number of diagnoses, be they on Axis I and/or Axis II PDs, reported a higher frequency of cognitive distortions than did individuals with fewer diagnosable psychological disorders or than who were otherwise free of diagnosable psychological disorders (r = .662, r^2 = .438, p < .001, one-tailed). This illustrates the
fact that almost 44% of the variance in the ICD was attributable to the number of Axis I and Axis II disorders for which an individual met diagnostic criteria—the more disorders, the more frequently they engaged in cognitive distortion.

These findings are consistent with the cognitive model of emotional disorders (Alford & Beck, 1997; Beck, 1967; Beck et al., 1979), which predicts that dysfunctional cognition correlates with psychopathology—in this case—generally across Axis I clinical syndromes and Axis II PDs.

*Axis I Clinical Syndromes.*

*Number of Axis I diagnoses.*

The study found that as the number of clinical disorders for which an individual met criteria increased (the total number of MCMI-III Clinical Syndromes, Severe Clinical Syndromes elevated above BR 75), so too did their tendency to engage in cognitive distortion. A significantly positive Pearson correlation coefficient ($r = .638$, $r^2 = .407$, $p < .001$) was obtained, indicating that over 40% of the variance in the ICD was attributable to the number Axis I disorders for which an individual met diagnostic criteria. This means that an individual who met criteria for only one Axis I diagnosis engaged in less frequent cognitive distortion than individuals with a greater number of clinical syndromes. These effects were incremental, with the tendency to engage in cognitive distortion increasing as the number of Axis I clinical syndromes increased.
These results are consistent with the empirical findings of Najavits et al. (2004), indicating that individuals diagnosed with comorbid clinical syndromes exhibit greater maladaptive cognition. This is also consistent with Beck’s (1967; Beck et al., 1979) cognitive model of emotional disorders which predicts that dysfunctional cognition correlates with psychopathology—in this case—generally across Axis I clinical syndromes than those meeting criteria for only one disorder.

Severity of Axis I clinical syndromes.

The severity of Axis I conditions (cumulative sum of all MCMI-III scale scores of BR 75 or greater on any of the Clinical Syndromes and/or Severe Clinical Syndrome scales) correlated significantly and positively with the frequency of cognitive distortions ($r = .693$, $r^2 = .48$. $p < .001$, one-tailed). This indicates that almost half of the variance in severity of Axis I syndromes was attributable to the frequency of cognitive distortion. These results are also consistent with Najavits et al. (2004), who found that individuals meeting criteria for two comorbid Axis I syndromes (PTSD and substance use disorders) were more liable to engage in more frequent cognitive distortions than those meeting criteria for only one of those disorders, operationalized as Cognitive Distortion Scale scores.

This finding lends additional empirical support to the cognitive model of emotional disorders for various Axis I clinical syndromes (Beck, 1967, 1976), which posits that schema-driven “cognitive errors” powerfully influence affect and behavior (Beck et al., 1979, p. 10).
Perhaps at the most fundamental level, one of the principal goals of CT is to reduce these characteristic patterns of distorted thinking. Even schema-focused approaches ultimately aim to replace maladaptive core beliefs with more adaptive cognitions, which maintain, and are perpetuated by, one’s cognitive distortions (Young, 1999). Thus, as was expected, the severity and number of clinical disorders correlated with the frequency of cognitive distortion.

These findings also lend support to Millon’s assertions (Millon & Davis, 1996; Millon et al, 1997) that higher MCMI-III clinical syndrome scale scores reflect more severe Axis I severity. As measured by the total frequency of cognitive distortion, the present study supports Millon’s contention.

**Axis II Personality Disorders**

*Number of personality disorders.*

The number of PDs for which an individual met criteria (the number of all significant MCMI-III Clinical Personality Pattern scales and Severe Personality Pathology scale that scored BR 75 or greater) correlated significantly with the frequency of cognitive distortions ($r = .563$, $r^2 = .312$, $p < .001$, one-tailed). Consequently, it appears that 31.2% of the variance in the number Axis II disorders for which an individual met diagnostic criteria was attributable to the total frequency of cognitive distortions.

A literature review revealed that studies investigating dysfunctional thinking in individuals with comorbid psychological diagnoses have focused on the influence of PDs on various Axis I conditions. No studies were found that examined the relationship between *the number of* multiple PD diagnoses and cognitive distortion. This is surprising because the correlation
between PD diagnoses have been shown to be significant. For example, Beck et al. (2001) determined that 32% of 756 outpatients with a primary Axis II diagnosis also met criteria for a secondary PD. These authors also posited the fact that although the Personal Belief Questionnaire (PBQ; Beck & Beck, 1991) differentiated five separate PDs (avoidant, dependent, obsessive–compulsive, narcissistic, and paranoid PDs), the PBQ subscales were moderately to strongly intercorrelated. Beck et al. (2001) proposed the idea that this corroborates the cognitive model of personality disorders and, perhaps, a general distress factor that may be a cause, a correlate, or a product of the inner experience and interpersonal functioning of individuals with PDs (APA, 2000; Beck et al., 2001; Millon, 1999). It is likely that cognitive distortions contribute to this general distress factor.

.  Severity of personality disorders.

There was a significant and positive relationship between the severity of PDs (cumulative sum of all MCMI-III Clinical Personality Pattern and Severe Personality Pathology scales scores of BR 75 or greater) and the frequency of cognitive distortions ($r = .757$, $r^2 = .573$, $p < .001$, one-tailed). This means that 57 percent of the variance in severity of personality disturbance was explained by differences in total ICD scores.

These findings are consistent with a recent study conducted by O’Connor & Dyce (2001), which demonstrated the fact that the MCMI—III was able to differentiate those individuals with PDs from those individuals failing to meet Axis II diagnostic criteria. These investigators determined that disordered personalities were very similar in characteristic but notably different in the degree from which they varied from the norm. Moreover, as in the present study, this
difference was detected by the MCMI-III. Also similar to the present study, although the degree of variance from “normal” predicted the presence of Axis II pathology, it failed to predict any specific personality disorder.

Consequently, the ICD successfully predicted presence and severity of Axis II conditions. Although the ICD predicted the extremity of the disorder and presence of personality disorder(s), it did not, however, predict the diagnosis.

*Comorbid Axis I and Axis II Disorders*

*Number of comorbid clinical syndromes and personality disorders.*

As was predicted, the ANOVA revealed that individuals with a greater number of comorbid Axis I and Axis II disorders engaged in more cognitive distortion than did individuals meeting diagnostic criteria for fewer disorders (F = 74.778, df = 123, p < .001).

This finding offers support for the cognitive model of emotional disorders (Beck et al., 1979) and the cognitive model of PDs (Beck et al., 2004), as well as the evolutionary model of psychopathology (Millon et al, 1996), which respectively assert that there may be an additive effect when comorbidity is present whether or not the disorders appear on either of the two DSM-IV-TR diagnostic axes. Moreover, the greater the number of diagnoses, the more severe the psychopathology (Diguer, Barber, & Luborsky, 1993; Farmer & Nelson-Gray, 1990; Shea, Glass, Pilkonis, Watkins, & Docherty, 1987), operationalized in the present case, as an increased frequency of cognitive distortions.
**Total severity of all psychological dysfunction.**

The total severity of psychological dysfunction across Axis I and Axis II (cumulative scores of 75 or greater on all MCMI-III Clinical Syndromes, Severe Clinical Syndromes, Clinical Personality Patterns, Severe Personality Pathology) positively correlated with cognitive distortions ($r = .748$, $r^2 = .56$, $p < .001$, one-tailed). This means that well over half of the variance in severity of psychological dysfunction, across clinical axes, was attributable to differences in total ICD scores. Moreover, the ICD was able to predict severity on both Axis I and Axis II.

Millon et al. (1997) conceptualized Axis I clinical syndromes as “extensions or distortions of the patient’s basic personality pattern... waxing and waning over time depending on the impact of stressful situations” (p. 22). The multiaxial model posits an interaction between Axis I and Axis II symptomatology in which personality is defined as the “…overall capacity to perceive and to cope with our psychosocial world…” (Millon et al., 1996, p. 120). Personality is further conceptualized as analogous to an immune system, protecting the individual from the fluctuating external stressors. However, Axis I symptoms may occur because the PD patients dysfunctional “immune systems” fails to protect the individual from stress. When this occurs, Axis I clinical syndromes arise in addition to the preexisting PD symptoms. This increases the total severity of the individual’s dysfunction (Millon et al., 1996). In other words, all other things being equal, an individual meeting the diagnostic criteria for both major depressive disorder and dependent personality disorder is expected to evince more impairment and/or distress than another person meeting diagnostic criteria for a disorder on only one of these axes. This was the case, as measured by the frequency of cognitive distortions.
Comorbid diagnoses across axes may lead to a pattern in which cognitive distortion can constrict behavior in a fashion that may actually exacerbate existing difficulties, leading to vicious circles of cognitive distortion, distress, and interpersonal impairment. When this occurs, one’s cognition may be further impaired by the resulting Axis I clinical syndromes. Prolonged Axis I symptoms can, in turn, exacerbate personality dysfunction (Millon et al., 1996; Millon & Davis, 1996).

Because of this reciprocal interaction between Axis I and Axis II, it was expected that individuals with greater total pathology would experience more frequent cognitive distortions, independent of whether or not this pathology arose from Axis I or Axis II. This explains why Millon & Davis, (1997) posit the idea that the presence of Axis I pathology supports the presence of personality pathology. Our findings supported this theory.

The Relationship between Cognitive Distortions and Individual Disorders

A series of Point-Biserial Correlations confirmed the fact that the hypothesized positive correlation between most of the MCMI-III individual clinical diagnostic scores and total ICD scores was significant (see Table 4). According to the cognitive model, cognitive distortions were expected to correlate positively with psychological disorders as assessed by the MCMI-III both on Axis I or Axis II. This was the case for most Axis I and Axis II disorders. The major findings of the present study were as follows: First: the results lend strong support for the cognitive model. Regardless of whether or not disorders occur on Axis I or Axis II, the severity of the disturbance was significantly attributable to the frequency of cognitive distortions. As the frequency of cognitive distortions increased, so too did the severity of disturbance. Second, as
the frequency of cognitive distortions increased, so too did the number of disorders for which an individual met criteria. In short, the more disturbed the patients were, the more frequently they engaged in distorted thinking. This occurred regardless of the specific diagnosis.

However, a number of exceptions were discovered. First, although correlated in a positive direction, both bipolar disorder ($r = .104, p < .109$, one-tailed) and drug dependence ($r = .063, p < .228$, one-tailed) failed to reach statistical significance. Lack of correlation between cognitive distortions and these particular two Axis I syndromes may be partially explained by the empirically demonstrated environmental, physiological, and genetic components attendant to these syndromes. In the case of bipolar disorder, for example, this may explain why CT alone has been shown as insufficient in ameliorating bipolar disorder and is, rather, recommended as an adjunct to, but never a substitute for pharmacotherapy (e.g., Scott, 2001; Tsai, Chen, Kuo, Lee, Lee, & Strakowski, 2001). If CT ameliorates cognitive distortions in bipolar disorder, but other factors account for a greater proportion of dysfunction and distress than such dysfunctional thinking, it would be understandable that CT would not be a sufficient treatment for this disorder.

Similarly, the lack of significant correlations between cognitive distortions and drug dependence may result from a significant contribution of powerful physiological and genetic influences, as well as significant behavioral and interpersonal factors that impact substance abusers (e.g., Higgins, Heil, Lussier, 2004; Robinson & Berridge, 2003).

Additionally, three Axis II disorders were significantly but negatively correlated with frequency of cognitive distortion. Specifically, NPD ($r = -.214, r^2 = .046, p < .05$, one-tailed); HPD ($r = -.266, r^2 = .071, p < .001$, one-tailed); and OCPD ($r = -.343, r^2 = .118, p < .001$).
However, a review of the data and the literature should help to explain the unexpected negative correlations between reported frequency of cognitive distortions and the presence of HPD, OCPD, and NPD. Although these results were surprising, they were not without precedent or explanation.

First, participants meeting the operational definition for the three PD diagnoses, HPD, OCPD, and NPD reported being significantly less likely to engage cognitive distortion; these were the only participants whose MCMI Validity Scales were questionable on one very important item—disclosure. In fact, for these individuals, the MCMI-III Modifying Index X or Disclosure Scale was as follows: HPD \( r = -.252, p < .002, \) two-tailed, OCPD \( -.284, p < .001, \) two-tailed, and although not statistically significant NPD \( r = -.088, p < .277, \) two-tailed.

The Disclosure Scale was designed to detect the extent to which people are honest and revealing, with low scores (below 34) indicating possible withholding of information (Millon, 1987). The tendency to withhold appeared to be represented in the negative ICD correlations. Although the Disclosure Scale was originally designed to be neutral as to simulating psychopathology (Millon, 1987), it has demonstrated the ability to detect both faking good and faking bad and is generally highly intercorrelated with the other two MCMI-III validity scales (Bagby, Gillis, Toner, & Goldberg, 1991).

Significantly, in a recent study, Shoenberg, Dorr, Morgan and Burke (2004) demonstrated remarkably similar findings, because three MMPI-2 validity scales Infrequency (F), Back-Page Infrequency (Fb), and Dissimulation (F-K) were highly correlated with the MCMI-III Disclosure scale. Moreover, there was a significant negative correlation between these three MMPI-2 validity scales and the same three PD scales that correlated negatively with the MCMI-III Disclosure scale: NPD, HPD, and OCPD. Thus, the present study replicated the findings that
individuals meeting criteria for NPD, HPD, and OCPD diagnoses disclose less information that is likely to be interpreted as dissimulation and, in the present case, report less cognitive distortions than individuals meeting criteria for other Axis I and Axis II conditions.

Additionally, the Disclosure Scale is a Modifying index, which allows for adjustment, increasing the probability of still attaining an accurate diagnosis. Thus, participants may have disclosed a sufficient amount to be properly diagnosed on the three PDs in question, yet their tendency to withhold may have been reflected in their ICD responses (Millon et al., 1997). In other words, with sufficient disclosure, scores of participants who met MCMI-III criteria for NPD, HPD and OCPD may have been more positively correlated with the Total ICD.

This begs the question: Why would individuals with these three PDs be less likely to disclose? In the case of NPD, grandiose self-importance, hypersensitivity to evaluation and need for admiration might understandably make it difficult to disclose or even recognize certain symptoms (APA, 2000). This failure to disclose could simultaneously reduce the MCMI-III Disclosure Scale and decrease these patients’ tendencies to divulge cognitive distortions. Consequently, as the NPD score is compensated by the Disclosure Scale Modifying index, and the ICD score is depressed by lack of disclosure, a negative correlation may be produced between NPD scores and Total ICD scores.

It has been demonstrated in the case of HPD that individuals meeting criteria for HPD are exquisitely concerned with self-presentation, experience higher autonomic nervous system arousal, and are easily influenced by other people and circumstances. This may make these individuals less likely to disclose their histrionic symptoms because doing so would be incongruent with their constant impression management—both public and private—or, alternately, they may not even be conscious of the information that they should disclose due to

Finally, why would individuals scoring high on the MCMI-III Compulsive Scale disclose less than other PDs? The answer is likely to be the perfectionism, indecision, and rigidity that may make them unaware of or unwilling to admit to internal thoughts and emotions (Beck et al., 2004) that may be detected by the MCMI-III Disclosure Scale. Also, Barber and Muenz (1996) found that patients with comorbid OCPD and depression responded significantly better when treated with interpersonal therapy rather than CT; this could indicate that there may be some mechanism other than cognitive distortions, such as interpersonal or behavioral components that account for a large part of the variance in this disorder. However, Barber and Muenz hypothesized that the interpersonal therapy differentially addressed perfectionistic, internal coping strategies characteristic of OCPD, whereas CT, as operationalized in their study, was more effective in ameliorating the externalized coping strategies.

Of course there are other possible explanations for the negative correlations; one of these is that HPD, OCPD, and NPD patients actually engage in less cognitive distortions than other clinical patients. Another alternative account is that the Disclosure Scale actually invalidated the MCMI-III profiles and that this data should be discarded. However, this would not explain why only one of three highly intercorrelated MCMI-III validity scales would correlate negatively with only these three PDs. Similar results were also obtained by Schoenberg et al. (2004), who showed that MCMI-III profiles were indeed valid on both the MCMI-III and MMPI-2 Validity Scales. Thus, the characteristics of HPD, OCPD, and NPD likely account for the fact that these three PDs correlated negatively with Total ICD scores.
In support of this conclusion, T. Millon (personal communication, September 20, 2004) posited the concept that individuals scoring higher on the three PD subscales in question, NPD, OCPD, and HPD, “tended to be closer to normal on the continuum of personality style. These individuals may or may not be pathological and this may reflect less cognitive dysfunction. They also have a tendency not to communicate as much as others regarding their problems and this is reflected in the negative correlation on the Disclosure Scale” with the Total ICD scores. “It is not surprising that they (NPD, OCPD, and HPD patients) would engage in less cognitive dysfunction” than other PD types.

In summary, the study provided further evidence for the cognitive model; that is, that cognition, specifically cognitive distortion, significantly predicted the severity of dysfunction, including the number of disorders on both diagnostic axes. Additionally, there is evidence of an additive effect, with maladaptive thinking intensifying as severity and the number of diagnoses increases. This may explain why it is more difficult for clinicians to treat individuals with more severe and/or comorbid conditions.

Additionally, the study provided good psychometric support for the ICD in the form of concurrent validity with the MCMI-III. Conversely, the study demonstrated that the MCMI-III is sensitive to differences in cognition. As a consequence, the clinical value of the ICD and the MCMI-III, when used as tools for assessment and treatment of psychological disorders should not be underestimated.

The ICD is an efficient, practical instrument that can provide clinicians with important data, accounting for about half of the variance in symptomatology for both clinical syndromes and PDs. Individual ICD items can also inform the clinician about which specific maladaptive
thoughts and cognitive distortions to target as treatment progresses. Similarly, the MCMI-III has proven, once again, to be a valid assessment instrument for clinical research.

Limitations of the Study

The ICD appears to offer promise as an instrument, providing a cohesive and efficient means to assess cognitive distortions relevant to both Axis I and Axis II disorders. However, additional examination of the psychometric properties of this new measure is urged. Areas requiring additional investigation for the ICD might include additional test–retest reliability and convergent validity, comparing the ICD to other existing cognitive distortion scales; it might also involve larger sample sizes of participants with particular disorders to study the relative influence of individual cognitive distortions on those specific disorders (Schoenberg et al., 2004).

Another potential limitation of the study is the fact that severity was operationally defined with a novel formula, the cumulative score of all MCMI-III scores of 75 or above. However, this formula was consistent with Millon’s (et al., 1996) theory and his personal communication of October 5, 2004.

The MCMI-III is one of the most widely accepted measures of psychopathology and perhaps the most widely used measure of personality; it was, in fact, designed for diagnostic screening and assessment of clinical populations in clinical research and practice. However, others have reported its limitations. These include questions regarding reductions in construct and convergent validity from the earlier versions of the MCMI, as well as discriminant correlations that were higher than convergent validities on a number of scales. This means that
some scales correlated more highly with measures of other disorders than the ones they were intended to assess (Rogers, Salekin, & Sewell, 1999). These findings and others have led Rogers et al. to claim that the MCI, MCMI-II, and the MCMI-III are really separate measures requiring further validation.

Finally, the study employed two self-report instruments: the ICD and the MCMI-III. There are a number of potential limitations attendant on all such instruments, including idiosyncratic differences in the way participants interpret individual items, the effect of participants’ current affective state on responses, the reactive nature of such instruments, and the influences of social desirability and self-presentation (Kazdin, 1998). Additionally, the use of forced choices may limit and distort responses (Birelson, Hudson, Buchanan, & Wolff, 1987). Limitations of all psychometric instruments argue for a multitrait, multimethod approach to assessment (Kenny & Kashy, 1992).

Recommendations for Future Research

In future research, it would be beneficial to explore whether or not particular distortions on the ICD are more relevant to specific disorders. Longitudinal research could also investigate whether or not there is an immediate relationship between symptom remission and the abatement of cognitive distortions or whether or not there is some lag time on either factor. It would also be interesting to determine whether or not the negative correlations between HPD, OCPD, and NPD were replicable in a larger sample and with other measures of cognitive distortion.

Furthermore, Beck et al. (2001) determined that specific dysfunctional beliefs attendant on PDs (Beck & Freeman, 1990), as measured by the Personal Beliefs Questionnaire (Beck &
Beck, 1991), could predict specific PDs. It is recommended that the data collection begun in the current study be extended to obtain a sufficiently large sample; this would demonstrate whether or not individuals with specific disorders have a greater tendency to engage in particular cognitive distortions. Moreover, efforts should be made to replicate Yurica’s (2002) impressive test-retest findings to ensure that extraneous events, such as the terrorist attacks of September 11, 2001, did not unduly influence the ICD’s reliability results (Yurica, 2002).

Finally, while the ICD may explain up to half of the variance in psychological disorders, other factors must also contribute to psychological dysfunction. These factors may include dynamics related to an interaction of influences, be they biological, social, genetic, neurological, genetic, physiological, or aspects of cognition and behavior other than cognitive distortion. These factors should be the subject of future research.

Conclusions

Despite the above limitations, there is proof that the ICD has once again provided a valid and reliable measure of cognitive distortion underlying a wide range of psychological disorders across both Axis I and Axis II. The current study provided further support for the psychometric properties of the ICD and validated its application beyond the realm of Axis I and into PDs in a heterogeneous, adult, outpatient sample. The ICD also appears to be valid in older populations because the present sample ranged in age from 18 to 86 years. The ICD appears to be a valuable, psychometrically sound instrument for the evaluation and treatment of clinical syndromes as well as PDs by illuminating treatable cognitive distortions that correlate so highly with dysfunction.
This study has also demonstrated that reduced frequency of cognitive distortions correlates with diminution in the severity and number of diagnosable disorders. Consequently, to the extent that clinicians successfully attend to and reduce this variety of dysfunctional thinking, they should see a commensurate reduction in pathology because the present study has demonstrated the fact that the frequency of cognitive distortions accounts for up to 50% of the variance in the number and severity of many psychological disorders on both diagnostic axes. Thus, using a tool, such as the ICD, that illuminates these troubling tendencies may greatly aid in establishing crucial baseline data, advance the evaluation of treatment response, and thereby improve treatment outcome.
References


In P. M. Salkovskis (Ed.), *Frontiers of cognitive therapy* (pp. 1—25). New York: Guilford Press.


Kay, J. H., Altshuler, L. L., Ventura, J., & Mintz J. (2002). Impact of axis II comorbidity on the


Kiesler, D. J. (1986). The 1982 interpersonal circle: An analysis of *DSM-III* personality disorders. In T. Millon & G. L. Klerman (Eds.), *Contemporary directions in*
psychopathology: Toward the DSM-IV (pp. 571-597). New York: Guilford.


Leichsenring, F., & Leibing, E. (2003). The effectiveness of psychodynamic therapy and
cognitive behavior therapy in the treatment of personality disorders: A meta-analysis.


Millon, T., Davis, R. D., Millon, C. M., Wenger, A., Van Zuilen, M. H., Fuchs, M., Mulder, R. T., & Joyce, P. R. (1994). The relationships of the Tridimensional Personality
Questionnaire to mood and personality measures in depressed patients. *Psychological Reports* 75, 1315-1325.


implications of personality disorders in a sample of depressed outpatients. *Journal of Personality Disorders, 1*, 27-42.


CA: Consulting Psychologists Press.


Association for the Advancement of Behavior Therapy, Chicago, IL.


