The Effects of Yoga on Symptoms Associated with Conduct Disorder with Callous Unemotional Traits as a Moderator

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THE EFFECTS OF YOGA ON SYMPTOMS ASSOCIATED WITH CONDUCT DISORDER WITH CALLOUS UNEMOTIONAL TRAITS AS A MODERATOR

By

Kym M. McCabe

A DISSERTATION

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THE EFFECTS OF YOGA ON SYMPTOMS ASSOCIATED WITH CONDUCT DISORDER WITH CALLOUS UNEMOTIONAL TRAITS AS A MODERATOR

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The purpose of this research was to investigate the additive therapeutic effects of a yoga intervention on the anxiety, depression and behavioral problems of conduct-disordered male adolescents in residential treatment. In addition, the moderating effects of callous-unemotional (CU) traits on outcome measures were assessed. The program consisted of a four-week intervention program in which participants were randomly assigned to either the yoga group (n=25), in which they practiced yoga with an instructor, or the control group (n=19), in which they met for a supervised study hall. The study included pre-testing on symptoms of anxiety, depression and CU traits, and post-testing on anxiety and depression measures only. Behavioral data were unavailable due to unanticipated program changes. A repeated measures MANOVA was utilized to investigate the benefits of yoga practice on a combined mental health variable that consisted of two dependent variables, anxiety and depression. A significant effect for time, but not for the interaction between time and group, was found. This indicated that both groups’ scores decreased over time on the depression and anxiety variables, but that there was no statistically significant difference between the treatment groups’ depression and anxiety scores over time. In spite of non-significant results, additional exploratory analysis was conducted. Results indicated a trend towards significantly greater decreases
in anxiety outcomes for the yoga group vs. the control group over time. The moderating effects of CU traits on the relationships among the treatment conditions and anxiety outcomes were found to be non-significant. Limitations of the present research, including low sample size and statistical power, are discussed.
Dedication

To Mom and Dad

For making everything possible
Acknowledgments

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CHAPTER 1

INTRODUCTION

The United States Surgeon General reported in 2001 that violence and antisocial behavior among youth are rising at an alarming rate (Bloomquist & Schnell, 2002). Children whose violent behavior and conduct problems persist are at risk for developing mental health problems, school failure and occupational difficulties, family problems and problems with the law (Frick, 2001; Steiner, Saxena & Chang, 2003). Society is affected directly through victimization by these individuals or indirectly through the costs of rehabilitation and treatment in mental health, medical, educational and other social service delivery systems (Ipser & Stein, 2007; Williams, Rivera, Neighbours, & Reznik, 2007).

Given the great cost to individual and society, it is not surprising that the treatment of behaviorally disordered youth accounts for over 50% of pediatric mental health referrals (Waschbusch, et al., 2002), and has been the focus of a large number of controlled treatment outcome studies (Frick, 2001). A review of “effective” psychosocial interventions for conduct disordered children and adolescents (Brestan & Eyberg, 1998), identified eighty-two published outcome studies, involving over 5270 children. Although this extensive effort far surpasses the research on most other childhood disorders, reports indicate that these treatment interventions are often ineffective (Frick, 2001; Kazdin, 1997).

The ineffectiveness of current treatments may be attributed to various causes. First, conduct-disordered youth are a difficult group to treat because they are noncompliant almost by definition (APA, 2001; Ipser & Stein, 2007). Second, a wide
range of biological, functional and psychosocial risk factors converge in the genesis and maintenance of the disorder (Burke et al., 2002). Third, “conduct disorder” generally does not present in isolation. Instead it presents with a host of co-occurring diagnoses such as ADHD, mood and anxiety disorders, and substance abuse disorders (Kazdin, 1997; Riggs, Leon, Mikulich & Pottle, 1998).

This constellation of contributing factors suggests the need for multi-modal interventions that target the different processes implicated in the development and maintenance of conduct disorder (Frick, 2001). Parent management training (PMT), multisystemic therapy, cognitive-behavioral strategies (CBST), and pharmacotherapy target many of these factors, in various combinations, with some degree of effectiveness, but as was previously mentioned, not without significant limitations and failures (Frick, 2001; Kazdin, 1997). Undoubtedly, there is still more work to be done in understanding the developmental and contextual factors of conduct disorder, as well as how these factors may interact and affect treatment outcomes.

One new approach, which may augment the benefits of current interventions is yoga. Although the concept of yoga as a therapeutic intervention may fall well outside the realm of traditional approaches, there are compelling reasons to seriously consider its usefulness with this population. First, due to the generally non-compliant nature of conduct-disordered youth, they may be more likely to participate in an intervention that is not “therapy like” in nature. While practicing yoga, individuals acquire new skills, which have immediate subjective rewards, such as increased feelings of relaxation and well being (Peck, Kehle, Bray & Theodore, 2005), which may then serve to reinforce further participation, and the generalization of acquired skills to other contexts. These are very
important considerations as treatment drop-out is especially high (between 40-60%) among aggressive and antisocial youth and their families (Kazdin, 1997) in standard treatment modalities, and the challenge of getting youth to use skills outside the therapy context has been identified as a key limitation in CBST (Frick, 2001). Second, research has documented that yoga has positive effects on important CD risk factors such as: attention (Peck, Kehle, Bray & Theodore, 2005), aggression (Schell, Allolio, & Schonecke, 1994), impulsivity (Jensen & Kelly, 2004) and arousal levels (Telles, Reddy & Nagendra, 2000). In addition, other risk factors such as lower intellectual and academic functioning, and deficits in verbal expression, which are associated with poorer outcomes in more cognitively oriented approaches, do not adversely affect outcomes for yoga participants. Third, research has demonstrated that practicing yoga improves symptoms of depression (Pilkington, Kirkwood, Rampes & Richardson, 2005) and anxiety (Kirkwood, Rampes, Tuffrey, Richardson & Pilkington 2005); disorders that commonly co-occur with conduct disorder. Finally, yoga targets these important elements of conduct disorder without the significant side effects and costs commonly associated with pharmacotherapy.

With these significant benefits in mind, along with the negative long-term prognosis of conduct-disordered youth, and the limitations of current treatment approaches, the goal of the present research is to consider the effectiveness of yoga as an “additive” or complementary treatment for the symptoms of conduct disorder. In the pages to follow, a literature review will set the context for the relevancy of this study, first, by identifying diagnostic criteria, developmental issues, and current treatment options for conduct disorder. This will be followed by a brief review of yoga history, a
discussion of how yoga “works”, a review of relevant yoga research and a description of the purpose of the study and hypotheses. The study setting, participants, measures and procedures utilized to collect the data will then be discussed, followed by presentation of data analyses strategies and results. Finally, the results will be discussed and considered within the context of previous research and implications for treatment and future research will be considered.
CHAPTER 2
LITERATURE REVIEW

Reports indicate that between twelve and twenty-two percent, or approximately 7.5-14 million of our nation’s youth, suffer from emotional or behavioral disorders (Costello, 1989; Kazdin, Bass, Ayers, & Rodgers, 1990), with approximately eight million children in need of mental health services (Day & Roberts, 1991). As alarming as this estimate may be, due to diagnostic criteria cutoffs and children who are not referred or who do not present for treatment, this number may be low in comparison to the number of children and adolescents actually suffering from various mental health problems.

Five categories have been identified in which the broad spectrum of symptoms expressed by children and adolescents may fall (Kazdin, 2003). These five categories include: externalizing disorders, internalizing disorders, substance-related disorders, learning and mental disabilities and severe and pervasive psychopathology. Reports indicate that most clinical referrals for children and adolescents are related to symptoms within the internalizing and externalizing domains. Of these two domains, the vast majority of clinical work and applied research is focused on the externalizing behavior disorders (Kazdin, 2003). This may be attributed to the fact that children rarely refer themselves, or identify to others that they are experiencing distress. Therefore, children whose symptoms distress others, are much more likely to be referred and brought in for treatment.
The present research will focus on the treatment of externalizing behavior problems, specifically conduct disorder (CD). Internalizing behavior disorders will be addressed peripherally, as comorbid disorders, which may affect the presentation and treatment of CD.

Externalizing behavioral problems

Externalizing problems generally refer to disruptive behaviors directed toward the environment and others (Kazdin, 2003). In the literature, externalizing behaviors may be labeled as ungovernable, out of control, incorrigible, hyperactive, socially deviant, discipline problems, emotionally disturbed, acting out, conduct disordered, antisocial behaviors, hard-to-manage, disruptive behaviors or non-compliant behaviors (Maughan et al., 2005). Some authors also include “at risk” behaviors such as substance abuse, delinquency, and unemployment in this domain.

Many of the problems associated with adolescence such as substance abuse, delinquency, and unemployment are transitory, with individuals aging out of these behaviors and becoming “sober, law abiding, employed adults” (Steinberg & Morris, 2001). For this reason, diagnostically, it is important to distinguish between occasional, usually harmless experimentation and enduring patterns of behavior. Interestingly, significant indicators (i.e. ADHD, neurological insult, conduct problems in preschool) that discriminate which individuals will age out and which will have persistent symptoms are revealed in very early childhood (Moffitt, 1993).

The externalizing behavior domain encompasses the DSM-IV’s Attention Deficit and Disruptive Behavior Disorders (DBD) (APA, 2000). This domain includes attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and conduct
disorder (CD). It is not uncommon for a child to present with symptoms from all of these disorders. In this case, intensity and frequency of behaviors is usually the discriminating factor. Developmentally, ODD usually presents as a precursor to CD, with CD following as a precursor to the development of antisocial personality disorder (APD).

Comorbidity among the DBD’s and ADHD is not uncommon. Research indicates that ADHD and ODD are estimated to co-occur 35% of the time, and ADHD/CD, 50% of the time (Althoff, Rettew, & Hudziak, 2003). The ADHD/CD pattern of comorbidity is considered to be an especially virulent combination, and is associated with earlier onset and poorer outcomes (Lahey et al., 2002; Satterfield & Schell, 1997).

The DBD’s are also associated with the development of concurrent mood disorders, anxiety disorders, somatoform disorders and substance-related disorders. In fact, research (Eiraldi, Power, & Nezu, 1997; Loeber, Burke, et al., 2000; Moffitt, 1993) has indicated that symptoms of internalizing problems are evidenced at a higher rate in children with ODD/CD and ADHD/CD than in non-clinical samples of children, and that depression rates, suicidal thoughts, suicide attempts, and suicide itself are all higher in children diagnosed with a conduct disorder (Shaffer et al., 1996).

Diagnostically, CD encompasses the most severe permutations of child and adolescent behavioral problems. Within this classification, two diagnostic subgroups, childhood-onset and adolescent-onset CD, have been identified by the DSM-IV (APA, 2000). Childhood-onset CD is associated with the presentation of severe antisocial behaviors prior to adolescence, and often as early as preschool. Symptoms tend to “increase in rate and severity throughout childhood and into adolescence” (Frick & Dickens, 2006, p. 60), placing these children at high risk for enduring patterns of
antisocial and criminal behavior into adulthood. Greater levels of impulsivity and family
dysfunction are associated with this group (Frick, 2006). Conversely, children with
adolescent-onset CD demonstrate a more abrupt disruption of behavior with the start of
behavior problems coinciding with the onset of adolescence. Behavior problems
commence in adolescence and are more related to rebelliousness, rejection of traditional
status hierarchies and association with deviant peers. Symptoms usually subside as the
adolescent moves into adulthood.

Among the childhood onset group, research indicates that only a small percentage
of youth are responsible for a large proportion of the most severe behavioral problems
(Frick & Loney, 1999). With this in mind, current research (for review see Frick &
Dickens, 2006) has identified symptoms, which appear to be related to the more severe
behaviors. Based on the presence or absence of these symptoms, two subgroups have
been formed. The first subgroup is characterized by the presence of callous-unemotional
traits (CU). Other risk factors associated with this group are: 1) A preference for novel,
exciting, and dangerous activities, and lower scores on anxiety measures and neuroticism
than other children with equivalent levels of conduct problems; 2) Deficits in passive
avoidance learning/ poor response to punishment cues; and 3) Severe emotional deficits
demonstrated by less emotional reactivity to threatening and emotionally distressing
stimuli than other antisocial youth. High levels of CU traits are estimated to occur in 28%
of clinic-referred children with childhood onset CD (Frick & Dickens, 2006).

The second subgroup is identified by the absence of CU traits. Other identifying
characteristics of children in this subgroup include: 1) Less aggressive behavior, which
when present, is generally reactive in nature; 2) Conduct problems that are more strongly
related to intellectual deficits (especially verbal intelligence), and ineffective parenting practices; and 3) Higher levels of self-reported anxiety, and poor emotional and behavioral regulation. These youth also evidence more reactivity to distress in others in social situations, and are highly reactive to various types of negative stimuli.

Research indicates that among these factors, emotional arousal is the quality that most clearly distinguishes between CU and non-CU youth. Specifically, the lack of emotional arousal among the CU group, and emotion regulation deficits among the non-CU group (Frick & Morris, 2004).

CU traits are considered by many to be the cornerstone of the psychopathic personality (Pardini, Lochman & Frick, 2003), and are predictive of particularly severe and violent behavior in adults. The feasibility and relevance of identifying these traits in children and adolescents has been evidenced in recent treatment outcome studies with adjudicated youth (Frick & Dickens, 2006). For example, in a sample of sixty-nine youth, the presence of these traits was associated with non-compliance to a diversion program and predicted re-arrest at one-year follow-up (Falkenbach, Poythress, & Heide, 2003), higher rates of probation breaches, violent offenses, sexual offenses, and shorter time to reoffending after release from a sexual offender treatment program (Gretton, et al., 2001), and the number of disciplinary infractions and longer length of time required to progress through residential treatment program for adjudicated youth (Spain, Douglas, Poythress, & Epstein, 2004).

Risk factors

The etiology of conduct disorder is not fully understood. Research indicates a wide range of child biological and functional factors, as well as psychosocial factors,
which may contribute to the development of CD (Steiner et al., 1997; Burke et al., 2002). Risk factors include: (a) biological factors such as genetic predisposition (suggested by twin and family studies), prenatal or early developmental exposure to toxins, physical damage to the brain, and alterations in brain functioning (specifically deficits in frontal lobe and amygdala functioning), underarousal of the autonomic nervous system, and low levels of serotonin; (b) child functional factors such as temperament, attachment, intelligence and academic performance, reading problems, impulsivity and behavioral inhibition, and poor social skills; and (c) psychosocial factors such as poor parenting, selective mating, child abuse, peer effects, neighborhood and socioeconomic factors, life stressors and poor coping skills (Burke et al, 2002).

Treatment

“Children with disruptive behaviors represent a difficult-to-treat population, as they are noncompliant almost by definition” (Ipser & Stein, 2007, p. 129). The diverse range of risk factors and frequent comorbid conditions which converge in the development and severity of DBD suggest a need for multimodal interventions. Current treatment strategies for the DBD’s may include one or a combination of the following: pharmacotherapy, cognitive behavior therapy, parent training, and/or multi-systemic therapy.

Pharmacological intervention. “There are to date no registered medications for the treatment of disruptive behavior disorders” (Ipser & Stein, 2007, p. 129). Although a recent review (Ipser & Stein, 2007) identified thirty randomized controlled studies conducted between 1966 and 2006 on the pharmacological treatment of disruptive behavior disorders, conclusive evidence remains to be seen on its efficacy and long-term
safety, as research has yielded inconsistent results. Research to date has assessed the benefits of mood stabilizers, antipsychotics, anti-hypertensives and psychostimulants on the behavioral problems associated with conduct disorder.

Research on the efficacy of mood stabilizers for the treatment of aggression has produced mixed results. Studies have demonstrated the use of lithium to be superior to placebo (Campbell et al, 1984, 1995; Malone, 2000), equal to placebo (Klein, 1991; Rifkin, 1997; Malone, 1998) and “questionable” (Campbell, 1991). Divalproex was shown to be superior to placebo (Donovan et al, 2000); with more significant responses to higher (58%) vs. lower levels (8%) of the medication (Steiner et al, 2003), and carbamazepine was found to be equal to placebo (Cueva et al, 1996). Significant side effects (including arrhythmia, confusion, seizure, coma, and hypothyroidism, abnormal bleeding, and liver problems) associated with the use of mood stabilizers and requiring constant monitoring to ensure safety are weighty considerations in the cost/benefit analysis of this drug class.

Antipsychotics have also been utilized in the treatment of childhood aggressiveness. For example, risperidone demonstrated anti-aggressive properties in a study of children between the ages of five to fifteen who met diagnostic criteria for CD. Although results from this study were promising, side effects, the brevity of the study and the forty percent drop out rate diminishes the applicability of the results (Findling et al., 2000). The effectiveness of risperidone in treating disruptive behavior was also assessed in research in children with sub-average IQ’s (Van Bellinghen, 2001), in addition to a Disruptive Behavior Disorder diagnoses (Snyder, 2002); and an ADHD diagnosis (Buitelaar, 2001). Decreases in symptom severity were demonstrated in all but one of
these studies (Van Bellinghen, 2001), where it was found to be equal to placebo. Although these results appear promising, it is difficult to adequately interpret these results as most of the children participating in these studies were concurrently taking other psychotropic medications. In addition, it seems to be a substantial leap to assume that treatments that may be effective for children with subaverage IQ, may also appropriate for individuals with average and above average IQ’s.

Two other relatively brief studies assessed the benefits of the antipsychotics molindone and halperidol. One four-week long study with thirty-one, six- to eleven-year-old children found molindone to be superior to placebo in reducing behavioral problems (Greenhill et al, 1985). A second month-long study, with sixty-one, five- to thirteen-year-olds, found halperidol to be equal to lithium, but not without significant side effects, compared to those receiving lithium or placebo, including sedation and dystonia (Campbell et al., 1984). Other worrisome side effects associated with the use of antipsychotics include extrapyramidal effects (sudden, often jerky, involuntary motions of the head, neck, arms, body, or eyes), significant weight gain and somnolence, dizziness, hyperactivity, and nausea. More research is clearly warranted to determine the efficacy and long-term safety of antipsychotic use in the treatment of DBD’s.

The antihypertensive clonidine has also shown some promise in ameliorating disruptive behavioral problems. For example Kempe, DeVane, Levin, Jarecke, and Miller (1993) investigated the effectiveness of clonidine on severe, treatment resistant behavior in seventeen outpatients ranging in age from five to fifteen years of age. Significant improvements in behavior were evidenced in fifteen of the seventeen individuals, but
unfortunately these results should be viewed conservatively, as no control condition was reported and data were collected for only fifteen days.

Clonidine is often prescribed along with psychostimulants for the treatment of comorbid DBD’s and ADHD. For example, Connor, Barkely, and Davis (2000) considered the use of clonidine and methylphenidate, alone or in combination for treating ADHD and reducing the aggressive symptoms of CD and ODD. Significant improvements were revealed in all three groups (clonidine only, clonidine and methylphenidate, and methylphenidate only), with differences between treatments revealed on only a few measures.

Significant side effects must be considered when considering the appropriateness of clonidine for treatment. Side effects include: sedation, bradycardia, and hypotension (which requires pulse and blood pressure monitoring) and conversely, the risk of rebound tachycardia and hypertension in the case of abrupt discontinuation of use or just prior to next dose. In addition, following the unexplained deaths of four children who were taking a combination of the stimulant methylphenidate (Ritalin) and clonidine, the use of antihypertensives for behavioral problems has not been approved by the FDA (neurologychannel.com/adhd /medication).

Psychostimulants are, by far, the most commonly prescribed pharmacotherapy treatment for ADHD (Althoff et al., 2003). Due to the frequent comorbidity among ADHD and the DBD’s, psychostimulants may also in part be considered a relevant treatment approach for CD. Research supports the use of psychostimulant medication for severe attentional problems associated with ADHD, and indicates that it may have a positive affect on classroom behavior, academic progress and social interactions (for a
review, see Greenhill, 1998). Cessation or improvement of these behaviors can be considered an appropriate treatment goal for conduct-disordered youth. Although there is little evidence demonstrating their effectiveness in treating the conduct problems in children with CD alone, several controlled medication trials of children with comorbid ADHD/CD have demonstrated significant reductions in conduct problems (Hinshaw, 1991; Hinshaw, Heller, & McHale, 1992; Pelham, et al., 1993).

The use of stimulant medication may produce significant negative side effects such as dependency, insomnia, appetite suppression, obsessive-compulsive symptoms and growth suppression (Du Paul, Anastopolous, Kwasnik, Barkley & McMurray, 1996; Greenhill et al., 1999). In addition, prescribing stimulants for conduct disordered individuals may be risky due to its potential for abuse and street value among peers.

Although results from Ipser and Stein’s (2007) recent meta-analysis on the pharmacologic treatment of CD reports that most of the medications investigated were relatively well tolerated; side effects such as sedation, dizziness and nausea were also reportedly common. In addition, “the potential emergence of serious drug-related adverse events, such as extrapyramidal symptoms with antipsychotics is particularly worrisome” (Ipser & Stein, 2007, p. 137). Research indicates that pharmacotherapy should never be used as a sole treatment for CD (Steiner et al, 1997), and perhaps should only be considered as an adjunct for crisis and short-term intervention (Tate, et al, 1995). This is an important point. Psychoactive medications may decrease aggressive or impulsive behavior, making the initiation of treatment possible in some cases, but ultimately they do not provide the child with the opportunity to acquire more adaptive coping strategies. New coping skills may be utilized by the child long after therapy has been terminated,
whereas the discontinuation of pharmacotherapy results in the loss of all associated benefits. In spite of the limitations of current research and significant associated side effects, reports indicate a growing trend in the pharmacological treatment of children with behavioral problems (Zito et al., 2000).

*Psychosocial treatment approaches.* Evidence-based psychosocial treatment approaches for CD include parent management training (for review see Brestan & Eyberg, 1998), cognitive problem-solving skills training (for review see Kazdin, 2002), and multi-systemic therapy (for review see Sheldrick et al., 2001).

Parent management training (PMT) is currently the most widely researched and effective treatment for oppositional and aggressive children (Brestan & Eyberg, 1998; Frick, 2001; Kazdin & Weisz, 1998). It is based on the assumption that conduct problems in children are inadvertently created and sustained via maladaptive parent–child interactions (Kazdin & Weisz, 1998). These maladaptive patterns may include parents attending to negative behavior, non-attending to appropriate behavior and harsh commands and punishment. Therapy is generally conducted with the child’s parents who are taught how to identify problem behavior, implement appropriate interactions, and promote prosocial behavior in their children.

PMT has been most often utilized among preadolescents (Kazdin & Weisz, 1998). There is evidence that suggests that PMT is more effective among children than adolescents (Dishion & Patterson, 1992), but positive treatment effects have also been demonstrated among delinquent adolescents (Bank et al., 1991), and un-referred young adolescents with conduct problems (Dishion & Andrews, 1995). Other reports indicate that when severity is controlled, age no longer influences outcome (Ruma, Burke &
Thompson, 1996). So it may be that PMT is more effective among younger, or less severely disordered children and adolescents.

Other significant limitations include the high level of demands placed on parents in order for treatment to be successful, and the large number of parents who do not complete the required parenting training. As such, PMT has not proven to be effective for the most dysfunctional families and children (Kazdin & Weisz, 1998; Miller & Prinz, 1990). Considering that family dysfunction has been identified as a key risk factor in CD (Burke et al., 2002), and that treatment drop-out is especially high among aggressive and antisocial youth and their families (40-60%; Kazdin, 1997), PMT may not be the best treatment choice for more severe populations.

Cognitive-behavioral skills training (CBST) refers to a general intervention model designed to overcome deficits in social cognition and social problem solving which is evidenced in many oppositional and aggressive children (Frick, 2001). In general, CBST programs teach children how to recognize problems, identify precipitating thoughts, consider alternate responses, and then select the appropriate solution. Skills are honed via increasingly complex role-plays and other structured tasks and ultimately applied to real life situations. Prosocial behaviors are modeled by the therapist and reinforced throughout treatment (Frick, 2001; Kazdin & Weisz, 1998).

CBST outcome studies indicate reductions in aggressive and antisocial behavior in samples of impulsive, aggressive and conduct-disordered children and adolescents, at home, school, and in the community (for reviews, see Baer & Nietzel, 1991; Durlak et al., 1991). Positive treatment effects have been extended to clinically referred youth, both
inpatient and outpatient (Kazdin, 1993). These positive results, coupled with its sound theoretical underpinnings, make CBST a promising intervention approach.

In spite of its promise, CBST has some key limitations. First, although treatment effects may be considered “positive” statistically in these outcome studies, deviant behavior is often still above the normal range among participants. Sheldrick, Kendall, and Heimberg (2001) demonstrated this phenomenon recently in a comparison of treatment outcomes for conduct-disordered children. In this meta-analysis, outcomes from intervention studies, which assessed the benefits of, videotape parent training (VM), parent training (PCIT), and problem solving skills training (PSST; a CBST approach) were compared. Results indicated that “both VM and PCIT were more likely to produce post-treatment means that were clinically equivalent to the normative population” (Sheldrick et al., 2001, p. 425). These differences in treatment effects may be attributed to various factors including: PSST is directed at older children (mean age 10.8 years) than VM (mean age 5.2 years), and PCIT (mean age 4.6 years), and several of the PSST studies were conducted with inpatient populations, probably indicating a more severe level of pathology (Sheldrick et al., 2001). So, like PMT, it may be that CBST interventions are more effective with younger or less severe children. Second, is the challenge of getting these youth to generalize skills “learned in the program outside the therapeutic setting and to maintain the skills over extended periods of time after the intervention has ended” (Frick, 2001, p. 599). Finally, CBST is not as effective for youth with more severe problems, such as those with comorbid diagnoses, academic problems, lower reading abilities, and highly dysfunctional families, as it is for those with less dysfunction in these domains (Kazdin, 1995; Kazdin & Crowley, 1997).
Multisystemic therapy (MST) is a family-systems approach for the treatment of adolescents with antisocial behavior (Kazdin & Weisz, 1998). This approach considers how the adolescent’s problems have emerged and are sustained within the context of his family system, as well as the other systems (school, neighborhood, peers), in which he interacts. MST utilizes individual and family therapy, as well as various other strategies and techniques from PMT and CBST, to improve functioning at all levels of the adolescent’s system.

There is strong support for the effectiveness of MST including: the multi-dimensional/multi-domain conceptualization of CD treatment factors, the focus on severely impaired youth (delinquent youth with arrest records), and the replication of results across youth with different types of problems, including sexual offenses and substance abuse, and with neglectful and/or physically abusive parents (Frick, 2001). In addition, outcome measures have included socially relevant indicators such as arrest records and rates of reinstitutionalization.

Although these results are very encouraging, there are some relevant limitations. First, MST is a very demanding and expensive approach. It requires skilled therapists and the regular coordination of multiple, generally highly stressed, systems. Second, consistent, high-quality participation by clinicians, parents/families and other participating systems is necessary for positive outcomes. Finally, like PMT and CBST, individual and family factors associated with CD, are likely to place families at risk for terminating therapy prematurely, and be associated with poor treatment response and long-term prognosis (Kazdin & Weisz, 1998). Although MST is designed to address individual, parental, and family functioning problems, the high costs, treatment
limitations and the accumulation of associated CD risk factors, may limit the effectiveness of this promising approach with more severely impaired youth and their families (Frick & Dickens, 2006; Kazdin & Weisz, 1998).

New directions in research

Given what we know about the complexities of treating conduct disorder, the limitations of current interventions, and the negative long-term prognosis for individual and society, considering alternative treatment options seems prudent (Frick, 2001; Kazdin 1997). One complementary treatment option that shows promise due to its “non-therapy like” approach, immediate subjective rewards; such as relaxation and feelings of well-being (Peck et al., 2005), and its positive effects on important CD risk factors including: attention (Peck et al., 2005), aggression (Schell et al., 1994), impulsivity (Jensen & Kelly, 2004), arousal levels (Telles et al., 2000), depression (Pilkington et al., 2005), and anxiety (Kirkwood et al., 2005), is yoga.

Yoga

According to a recent national survey, one in five adults during the year 2002 employed some type of complementary or alternative therapy for a wide range of medical and psychiatric conditions. Among the most commonly used alternative therapies reported was yoga (Wolsko et al., 2004).

The use of yoga as a health practice is not a new concept. Although the exact history of yoga is unknown, the first written documentation of yogic philosophy dates back some 4000 years ago to sacred Indian texts known as the Vedas. Artifacts recovered from the Indus Valley civilization (c. 3000 B.C.E.), and the Vedic civilization (c. 1500 B.C. E.), suggest its use dates back at least 8000 years (Kenoyer, 1998).
Westerners were introduced to Yoga in 1893 by Swami Vivekananda, the first known Hindu Swami to come to the West. Vivekananda introduced Eastern thought and Yoga at the World’s Parliament of Religions in connection with the World’s Fair in Chicago (Nikhilananda, 1953). Since that time interest in the practice of yoga has increased considerably. Reports indicate a 43% increase the last five years with an estimated 10 to 16.5 million Americans currently practicing.

In its most traditional sense, yoga has been defined as a method of joining the individual self with the Universal Spirit through the practice of physical and mental exercises (Iyengar, 2001). Although yoga may have been created as a means of spiritual development, with its benefits to psychological and physical functioning long since recognized, recent literature reviews reveal a growing publication trend of randomized controlled studies using yoga as an intervention with various medical and mental health populations (Arias, Steinberg, Banga & Trestman, 2006; Pilkington et al., 2005; Kirkwood et al., 2005).

“Basic research on yoga has suggested that it is effective in influencing psychophysiological, neuroendocrine, and autonomic parameters and therefore has mostly been used to treat disorders that have a strong psychosomatic or psychological component” (Khalsa, 2004, p. 270). Yoga works on physiological and psychological states through a combination of physical postures (asana), breathing exercises (pranayama), mental concentration, and deep relaxation (meditation). The coordinated movements, deep stretching and focused breathing techniques of yoga decrease muscle tension and improve the circulation of blood and oxygen throughout the body, which in
turn affects the functioning of the central and autonomic nervous systems (ANS) (Peck, Bray & Theodore, 2005).

The ANS, which is comprised of the sympathetic and parasympathetic systems, regulates involuntary activity such as respiration and heart rate. These two systems generally control the same muscles and glands and work in a complementary fashion with one another. The sympathetic system increases heart rate and blood sugar levels, preparing the body to “fight or flight”, while the parasympathetic system decreases the heart rate, stimulates digestive secretions and prepares the body to rest and conserve energy (Peck et al., 2005). “In essence the process of yoga deactivates the sympathetic division and stimulates the parasympathetic system, resulting in a sense of calm, emotional balance, tranquility, and increased concentration” (Peck et al., 2005, p. 417).

Numerous studies have demonstrated the positive effect of yoga practice on the functioning of these physiological systems. For example, reductions in resting heart rate and breathing rate, and enhanced relaxation were demonstrated by Telles, Narendran, Raghuraj, Nagarathna, and Nagendra, (1997). Other research demonstrated improved regularity in breathing (Telles & Srinivas, 1999), reduced physiological arousal (Telles, et al., 1997), and increased concentration (Telles, Hanumananthaiah, Nagarathna & Nagendra, 1993). One recent study demonstrated that yoga novices who participated in a one-month yoga training residential program could voluntarily reduce their pulse rates (Telles & Vani, 2002).

Recent research has extended these findings related to yoga’s effects on conditions linked to arousal levels. For example, in an uncontrolled study of forty patients who met the criteria for chronic insomnia and participated in an eight-week
treatment phase, statistically significant results were achieved in most of the important subjective sleep measures (Khalsa, 2004). Second, cancer patients who participated in seven weekly Tibetan Yoga sessions (controlled breathing, mindfulness, and postures) evidenced improved sleep quality as compared to the wait list control group (Cohen, Warneke, Fouladi, Rodriguez, & Chaoul-Reich, 2004).

Although limited, research has been extended to consider the effects of yoga practice as an intervention for attentional problems and other related behavioral problems. Just recently, the effectiveness of yoga to improve time on task specifically was assessed among ten elementary children across three grade levels (Peck et al., 2005). In this study, participants met twice a week for three weeks, and followed a thirty minute yoga instructional video through a series of breathing, postural and relaxation exercises. Results indicated that yoga participants spent a greater time on task (effect size 1.5-2.7) than their untreated peers, who’s on task behavior remained essentially unchanged.

The extent to which yoga practice may affect broader attentional problems and other co-occurring behavioral problems has also been assessed in a limited fashion. For example, one early study (Redfering & Bowman, 1981) assessed yoga as a treatment for ADHD and oppositional behaviors. Reductions in inattention, impulsive behaviors and oppositional behavior were all achieved. More recently, Harrison, Manocha, and Rubia, (2004) investigated the benefits of a six–week Sahaja Yoga Meditation program as a treatment for ADHD. In this study, children, aged four to twelve-years-old, participated in two, weekly sessions and daily home practice that utilized yogic meditation. Results indicated improvements in the children’s ADHD symptoms, self-esteem and relationship
quality. Additionally, self-reported improvements in concentration levels at school and sleep, as well as decreases in anxiety level and conflict were revealed.

Another recent study (Jensen & Kelly, 2004), investigated the effects of a twenty-session yoga intervention as a complementary treatment on the behavior and attention of eleven adolescent boys with ADHD. All but two boys were already stabilized on medication, but continued to have significant lapses in treatment effects when off medication (weekends, after school). Participants attended weekly, one-hour sessions consisting of pranayama (breathing exercises), asana (postures), relaxation and meditation. Results from this study supported previous research with participants showing significant decreases in emotional lability, primary ADHD symptoms: including restlessness, impulsivity and inattentiveness, and oppositional behaviors: including aggression, anger and tension.

Yoga and its effects on affect. In addition to positively affecting physiological states and related behavioral problems, there is a growing body of research that supports the use of yoga to ameliorate symptoms of depression (Pilkington, et al., 2005) and anxiety (Kirkwood, et al., 2005). For example, Berger and Owen (1992) examined the mood benefits of yoga and swimming with eighty-seven college students. Results from this study revealed that participants in the yoga group experienced significant elevations in mood consistent, if not greater, than that of the swimming group. Additionally, significantly greater decreases in anger, tension and fatigue were reported among men yoga participants compared to those in the swimming group.

Significant improvements in depressed mood were also demonstrated among college students with depression who were randomly assigned to a thirty-day yoga
intervention comprised of practicing one yoga pose daily (Khumar, Kaur, & Kaur, 1993), and in depressed mood and anxiety among college students with mild depression who were randomly assigned to a five-week Iyengar-style yoga intervention (Woolery, Myers & Sternlieb, 2004). Decreases in negative affect were also noted in a group of randomly assigned college students after participating in just one ninety-minute Hatha yoga class (West, Otte, Geher, Johnson & Mohr, 2004).

Benefits on mood and anxiety have also been demonstrated in psychiatric populations (Lavey et al., 2005). For example, the effects of yoga on mood were examined in 113 psychiatric inpatients. Results indicated significant improvements in five negative emotion factors on the POMS, which were not linked to gender or diagnosis. Another study looked at patients with untreated depressed mood. In this study, one group participated in Sudarshan Kriya Yoga (focuses on pranayama-breathing exercises), while their study counterparts were assigned to either a medication group or electroconvulsive therapy. Results revealed that patients in the yoga group had significant improvements in depressed mood, which were comparable to the benefits attained by both the medication and electroconvulsive therapy groups (Janakiramaiah, et al., 2000). Other research has revealed improvements in symptoms of anxiety, and obsessive-compulsive disorder (Shannahoff-Khalsa & Beckett, 1996; 1999, Shannahoff-Khalsa, 2003) comparable to medication treatment.

Benefits of yoga practice on mood and anxiety have also been demonstrated among children. For example, Telles, Narendran, Raghuraj, Nagarathna and Nagendra (1997) demonstrated that boys and girls with social and emotional difficulties, including anxiety, fear and aggressive behavior benefited from practicing yoga.
Another more recent study examined the effects of a weekly, sixty-minute stress reduction program, based on yogic exercises on a group of forty-eight fifth grade students with symptoms of anxiety (Stueck & Gloeckner, 2003). Significant reductions in symptoms of anxiety, feelings of helplessness and aggression were noted, as well as significant increases in emotional balance. Other research assessed the immediate effects of one hour of relaxation therapy, consisting of yoga exercise, a brief massage and progressive muscle relaxation, in group of 40 hospitalized children with adjustment disorder and depression (Platania-Solazzo, et al., 1992). A significant decrease in anxiety was indicated by a self-report measure; decreases in anxious behavior and fidgeting were noted, as well as increases in positive affect. Although limited, taken together this previous research demonstrating the benefits of yoga practice on important CD risk factors provides a compelling case for assessing its benefits as a treatment for conduct disorder.

**Rationale for the Present Study**

“Conduct disorder is one of the most frequent bases of clinical referral in child and adolescent treatment services, has relatively poor long term prognosis, and is transmitted across generations” (Kazdin, 1997, p. 161). Due to the significant costs, both personal and monetary, that conduct disorder can represent to individuals, families, peers and society, its treatment has been the subject of a great deal of applied research (Brestan, & Eyberg, 1998). Unfortunately current treatment modalities are often ineffective, or subject to significant limitations or side effects. In order to meet the treatment needs of this challenging and compelling group, yoga is recommended as an “additive” or complementary approach in order to optimize therapeutic effects.
Although limited, research supports this line of research. First, yoga targets important CD risk factors. For example, research has documented that yoga has positive effects on: attention (Peck, Kehle, Bray & Theodore, 2005), aggression (Schell, Allolio, & Schonecke, 1994), impulsivity (Redfering & Bowman, 1981; as reported in Zipkin, 1985; Jensen & Kelly, 2004) and arousal levels (Telles, Reddy & Nagendra, 2000). In addition, other CD risk factors such as lower intellectual and academic functioning, and deficits in verbal expression, which are associated with poorer outcomes in more cognitively oriented approaches, do not adversely affect outcomes for yoga participants.

Second, yoga has also demonstrated effectiveness in decreasing symptoms of ADHD (Redfering & Bowman, 1981; Jensen & Kelly, 2004); another important CD risk factor that presents comorbidly 50% of the time (Ipser & Stein, 2007), and is linked to earlier onset of severe behavioral problems and poorer outcomes (Frick, 2001). Research has also demonstrated the benefits of yoga practice on depression (Pilkington et al., 2005) and anxiety symptoms (Kirkwood et al., 2005), two other often co-occurring disorders (Frick & Dickens, 2006).

Third, although pharmacological intervention may be appropriate and tolerated by some individuals, research indicates that pharmacotherapy should never be used as a sole treatment for CD (Steiner et al, 1997). Research indicates that yoga positively affects attention, impulsiveness (Redfering & Bowman, 1981; Jensen & Kelly, 2004), and aggression (Schell, Allolio, & Schonecke, 1994), symptoms frequently targeted by pharmacotherapy, without the significant side effects and costs commonly associated with pharmacotherapy.
Finally and perhaps most importantly, yoga may be more effective than other more traditional therapeutic approaches in engaging these youth, who are non-compliant by definition (APA, 2001), by means of its non-therapeutic/non-confrontational approach, and the almost immediate subjective feelings of relaxation and well being which accompany practice (Peck, Kehle, Bray & Theodore, 2005). In addition, due to the positive associations conduct disordered youth may develop towards yoga practice, they may be more likely to stay in treatment and transfer skills to other contexts.

**Purpose of the study**

A recent literature review revealed no experimental studies assessing the impact of a yoga intervention specifically for CD. The purpose of the present study is to assess the benefits of yoga as an additive therapeutic intervention for the behavioral, anxiety, and mood problems associated with CD. In addition, this study will assess how the presence of CU traits, traits linked by research (Frick, 2006) to a distinctly different, and more severe presentation of CD, will affect treatment outcomes. Two hypotheses will be tested. Hypothesis one is that a group of adolescent boys with severe behavioral problems in residential treatment who participate in yoga three times a week for four weeks are expected to evidence greater improvements in mood, anxiety, and behavior than a control group who participate in treatment as usual. Hypothesis two postulates that among the yoga participants, the level of CU traits will moderate treatment effects, such that individuals with lower levels of CU will benefit more from yoga than high level CU individuals.
Hypotheses

Hypothesis 1: Participating in Yoga practice will benefit male adolescent residents by significantly reducing behavioral problems and symptoms associated with anxiety and depression.

Hypothesis 1a: Following treatment and after controlling for differences in pre-test scores, participants in the Yoga group will demonstrate significantly fewer negative behavior log readings and significantly greater positive behavior log readings than participants in the control group.

Hypothesis 1b. Following treatment and after controlling for differences in pre-test scores, the reduction in symptoms of anxiety demonstrated by the Yoga group will be significantly greater than the reduction in symptoms of anxiety demonstrated by the control group.

Hypothesis 1c. Following treatment and after controlling for differences in pre-test scores, the reduction in symptoms of depression demonstrated by the Yoga group will be significantly greater than the reduction in symptoms of depression demonstrated by the control group.

Hypothesis 2: Among the Yoga group participants, CU traits will moderate the treatment effect such that participants with lower levels of CU traits will benefit more from yoga than individuals with higher levels of CU traits.

Hypothesis 2a. Among yoga group participants, individuals with lower levels of CU traits will evidence greater improvements in positive and negative behavior scores than individuals with higher levels of CU traits.
Hypothesis 2b. Among yoga group participants, individuals with lower levels of CU traits will evidence greater improvements in anxiety scores than individuals with higher levels of CU traits.

Hypothesis 2b. Among yoga group participants, individuals with lower levels of CU traits will evidence greater improvements in depression scores than individuals with higher levels of CU traits.
CHAPTER 3

METHOD

Participants

Participants were recruited from Bay Point Schools, a mid-size, moderate risk, staff secure, residential treatment program for 14-18-year-old male offenders in the southeastern United States. Adolescent boys are generally court ordered to this program due to severe property offenses and frequent and repeated law violations.

Bay Point School’s curriculum provides rehabilitation and treatment for these youth in areas such as hygiene, health, employability skills, vocational skills, educational planning, interpersonal skills, and knowledge of community resources. In addition, mental health and substance abuse counseling may be provided. The average length of stay at Bay Point is six months. Discharge from the program is contingent upon meeting general performance goals, as well as individual goals developed by the student and his counselor.

The Bay Point program utilizes a behavior management program that rewards each student’s consistent positive behavior through the elevation of school status and concurrent privileges. Positive behavior is assessed by the absence of negative behavior log entries and the presence of positive behavior log entries. Unfortunately, behavioral data were not collected as usual during the intervention period due to unexpected program changes.¹

¹ According to program social workers, program changes were initiated due to feedback from a program monitor from the Department of Juvenile Justice. Changes were to include an increase in positive reinforcement, and a decrease in negative reinforcement. Systemic problems followed in which all behavioral data were collected in an inconsistent manner.
Study participants were recruited from Bay Point’s student body starting with students at the lowest school status level, and then moving upward through all levels until 59 students with parental consent had been identified. Following parental consent, fifty-five boys, 14-18 years of age, provided assent for participation. Four students declined participation due to lack of interest.

Demographically, the study sample was 53% African-American, 23% Caucasian, 11% Hispanic, 11% Afro-Caribbean and 2% Mixed race. Sixty-seven percent of the participants were receiving mental health services during the intervention period and carried diagnoses of Conduct Disorder (66%), Disruptive Behavior Disorder (29%), Attention Deficit-Hyperactivity Disorder (29%), Conduct Disorder /Attention Deficit-Hyperactivity Disorder (16%), Disruptive Behavior Disorder /Attention Deficit-Hyperactivity Disorder (8%), and Oppositional Defiant Disorder (6%). In addition, 59% of these participants also carried at least one substance abuse diagnosis. Other diagnoses, including mood and anxiety disorders were notably absent in all but a few cases.

Measures

Revised Children’s Manifest Anxiety Scale-2 (RCMAS-2; Reynolds & Richmond, 2008). The RCMAS-2 is a forty-nine item self-report measure designed to assess the level and nature of anxiety in children and adolescents from ages six to nineteen. The assessment consists of forty anxiety related items, which are distributed among three subscales: Physiological Anxiety (12 items), Worry (16 items) and Social Anxiety (12 items), and nine “Lie” (social desirability) items. The respondent must “answer “yes” if the item is true for him, or “no” if it is not. “Yes” responses to the anxiety items are added to provide the individual and total anxiety raw scale scores. The total anxiety raw
score may be transformed into a “T-score” for which the technical manual provides the following qualitative descriptors: 71 and above = highly problematic anxiety symptoms; 61-70 = moderately problematic; 40-60 = no more problematic than for most students; and 39 and lower = less problematic than most students. “Lie” items are also totaled, with more than a total of six indicating that the individual may have selected responses in order to appear socially desirable.

According to the technical manual (Reynolds & Richmond, 2008), the RCMAS-2 was standardized on an ethnically diverse sample of 2,368 children ages 6 to 19, and demonstrated internal consistency of Cronbach alpha of .92 for the Total Anxiety Score, and .75, .86, and .80 for the Physiological Anxiety, Worry, and Social Anxiety subscales respectively. Construct validity has been demonstrated (Reynolds, 1980) by a correlation ($r = .85$) with the trait scale of the State-Trait Anxiety Inventory for Children (Spielberger, 1973).

The present study confirmed acceptable internal consistency for the pre-test Total Anxiety Score with Cronbach alpha of .90 and subscale scores of .68, .86, and .75, for Physiological Anxiety, Worry, and Social Anxiety respectively. Post-test alphas improved with Total Anxiety (.93), Physiological Anxiety (.76), Worry (.86), and Social Anxiety (.83).

The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report scale, written at sixth grade level and designed for individuals 13 and older. It contains statements about thoughts, feelings or behaviors associated with depressive symptoms. Youth are directed to identify which statement best describes how they have been feeling in the past two weeks using a Likert scale (0, 1, 2,
3), with scores related to the severity of symptoms. Inventories are later totaled and may be used as a total scale score or transformed into a “T-score”. Total scale scores may range from 0-63, and the following cut-offs are provided: 0-13= minimal depression; 14-19= mild depression; 20-28= moderate depression; and 29-63= severe depression.

According to the technical manual (Beck, Steer, & Brown, 1996), normative data for the BDI-II is based on: (1) A clinical sample (n=500; 63% female; 91% Caucasian) of individuals who sought outpatient services, and (2) A convenience sample of predominately white Canadian college students (n=120; 56% female). High internal validity was demonstrated within these samples with coefficient alphas of .92 for the outpatients and .93 for the college students. In addition, good test-retest reliability has been demonstrated over a one-week interval (r= .93) and construct validity has been established through significant correlations with other instruments measuring similar characteristics such as the Revised Hamilton Psychiatric Rating Scale for Depression (r= .71), and the Symptom Check List-90-Revised Depression subscale (r=.89) (as reported in Steer, Ball, Ranieri & Beck, 1999).

In the present study, the Cronbach alpha coefficient was .85 at pre-test, and .84 at post-test following the removal of three items (9, 16 & 21) with poor item-total correlations. Considering the present sample and its context, the inconsistency of these particular items is not surprising. First, following the publicized placement of one participant on suicide watch after indicating suicidal ideas (Item 9: Suicidal Thoughts or Wishes) on his pre-test, all other participants refrained from identifying any thoughts or feelings related to suicide. Second, it does not seem likely that teenage boys would admit a loss of interest in sex (Item 21: Loss of Interest in Sex). Finally, Item 16 is presented in
a slightly different format than other scale items, which resulted in unscorable responses by many participants, probably due to confusion and carelessness.

Inventory of Callous-Unemotional Traits (ICU). The ICU is a new 24-item self-report questionnaire designed by Frick (2003) to assess for callous-unemotional traits in youth. Each item on the measure is assigned a value on a 4-point Likert scale ranging from (0) indicating the characteristic is not at all true, to (3) indicating the characteristic is definitely true. An equal number of items are worded positively (I express my feelings openly); and negatively (I do not care who I hurt to get what I want). Item scores are totaled to create a total scale score which may range from 0-72. Higher scale scores are associated with higher levels of callous-unemotional traits.

Preliminary research on the psychometric properties of the ICU was conducted in Germany on a sample of 1443, 13-18-year-old Caucasian adolescents recruited from rural schools (Essau, Sasagawa, & Frick, 2006). A follow-up analysis was conducted on an ethnically diverse sample of a total of 248 detained or incarcerated juveniles, 12-20 years of age, recruited from areas around a large metropolitan area in the southeastern United States (Kimonis et al., 2008).

Exploratory and confirmatory factor analyses conducted by Essau (2006) revealed the presence of a general, underlying callous-unemotional factor, as well as three distinct, independent factors (Callousness, Uncaring and Unemotional) which demonstrated unique variances in their respective item sets. Confirmatory factor analyses conducted by Kimonis et al. (2008) study evidenced the same factor structure, following the deletion of two items, which had low factor loadings in the Essau study. Both studies reported acceptable internal consistency for the Callousness and Uncaring scales and low internal
consistency for the Unemotional scale. The internal consistency for the Total ICU score was acceptable in both studies with reported coefficient alphas of .77 (Essau et al., 2006) and .85 (Kimonis et al., 2008).

Coefficient alpha for the Total ICU score in the present study was .80 following the removal of five items (1, 2, 6, 19 and 22) with poor item-total correlations. In order to test the viability of the three-factor model and the usefulness of individual scale analyses with this data set, the remaining nineteen items were subjected to Principal components analysis using SPSS. Six factors emerged from this analysis with eigenvalues exceeding 1.0. Subsequent examination of the scree plot revealed what appeared to be a clean break after the second component (See Figure 1, Appendix E). Considering these findings, the items deleted (four of the five deleted items constitute four of the five items of the Unemotional scale), as well as the results of previous research, it was decided to retain two components for further investigation.

A secondary analysis was performed using principal components analysis in which all items were forced into two factors. Results from this analysis indicated a unidimensional callous-unemotional factor, with all but two items loading most heavily on the first factor. A second factor was evidenced with several high loadings, but in general most items cross-loaded more heavily on the first factor.

These results are consistent with previous research (Essau et al, 2006; Kimonis et al., 2008) in that the presence of a unidimensional (probably higher-order) callous-unemotional factor was supported. Also consistent with previous research was the low reliability of the Unemotional scale. In the present study, all but one of the items comprising this scale had to be deleted due to low item-total correlation with the total
scale, rendering this factor obsolete. Although previous studies supported the three-factor model, and were able to retain the Unemotional factor, albeit at low alpha scores, the limited sample size of the present study seems to have hindered my ability to replicate the 3-factor solution described by Essau et al., (2006) and Kimonis et al., (2008). For this reason, the present study utilized only the Total ICU score. Previous research (Essau et al., 2006; Kimonis et al., 2008) justifies the use of this score in that Total ICU scores have demonstrated predicted validity with self-report measures of aggression and delinquency, self-reported measures and psychophysiological indices of constricted emotion, and with measures of past offending that included reviews of institutional records and collateral reports.

*Student Behavior Management and Accountability Report.* Violent or aggressive physical behavior, verbal aggression, and covert aggression of study participants were to be assessed by tallying the number of conduct violations indicated in the *Student Behavior Management and Accountability Report* (Major and Minor code of conduct violations logs). Specific behavioral norms and violations are identified in Bay Point’s student manual. Conduct violations are described and rated as either major or minor. Each infraction carries an identified consequence. There are 34 major conduct violations identified that include behaviors such as: conspiracy, drugs on or off campus, fighting, escape or attempt to escape. Thirty-six minor conduct code violations have also been identified. Examples of these behaviors include: disruptive classroom behavior, not completing classroom or homework assignment, disrespectful behavior, and inappropriate attire. Behavior violations are logged by authorized personnel as needed, and tallied every two weeks. Log entries are discussed with the student and other
members of his treatment team (case manager, primary counselor, faculty member, therapist, and any other involved parties) during his bi-monthly team meeting. More than two negative log readings results in either a loss of upward status movement or drop in status. As was previously mentioned, these behavioral data were unavailable due to unexpected program changes.

*Positive Behavior Reinforcement Log.* Positive behavior was to be assessed by entries in the Positive Behavior Reinforcement Log. Positive behavior points are achieved by students for various pro-social behaviors and positive participation in program activities. Examples of these behaviors include: peer-to-peer counseling, redirecting peers from negative acts, progress in educational, therapeutic, vocational, athletic and other leisure goals. Students are responsible for getting appropriate signatures from supporting staff members in their positive reinforcement logs, and bringing logs to bi-monthly treatment team meetings for review. Examples of positive behaviors and points that may be earned include: completion of a performance plan goal earns 75 points; completion of a therapeutic goal earns 25 points. As was previously mentioned, this information was not collected as usual during the research period.

*Procedures*

Information and informed consent documents for the study were mailed to the parents of youth enrolled at Bay Point Schools by a school staff member. The informed consent document described the basic procedures of the study, the limits of confidentiality, and the voluntary nature of participation. The researcher was available via telephone to answer any questions or concerns related to study participation.
The parents or guardians of fifty-nine boys provided consent for participation. Following parental consent, the researcher met individually with each adolescent to provide information regarding study participation, discuss the voluntary nature of participation, answer questions and complete assent forms. Prospective participants were informed that they would be awarded one hour towards their program’s community service requirements for each complete hour they participated in the study. The boys in general had limited, but positive impressions of yoga, often linking it to feelings of relaxation. Four boys with parental consent declined participation at this time due to lack of interest.

Pre-testing took place the week before the intervention period began. The researcher met with groups of eight to ten students and administered all assessments, including the Beck Depression Inventory-II (BDI-II), the Revised Children’s Manifest Anxiety Scale-2 (RCMAS-2), and the Inventory of Callous-Unemotional Traits (ICU) orally. Participants were instructed to listen carefully as the researcher read each question aloud, follow along with their own test booklets, raise their hands if they did not understand the question, and then select the appropriate response.

Following pre-test procedures, fifty-five boys were matched by their ICU scores and then randomly assigned to either the yoga intervention group, or the control group. Twenty-nine boys started in the yoga group and 25 started in the control group. Study groups were split in half to form two yoga groups and two control groups. Groups were scheduled back-to-back, with one yoga and one control group meeting each hour. Both groups met for one hour, three times a week, for one month. Attendance rates for both
groups were similar, with all participants attending an average of nine out of twelve sessions.

Group placement was based on student availability, with no more than fifteen students in any group at one time. Due to program scheduling conflicts, the only time period available for study participation was during lunchtime. Although lunch was provided after meetings, this created a significant conflict for participants. For this reason the researcher provided a light snack (piece of fruit or a cookie) to all participants at the beginning of each session.

Following randomization, control group participants in general reported dissatisfaction and lack of interest in continued participation due to their group assignment. In order to keep these participants engaged, yoga classes were promised and provided to interested control group participants following post-testing. Post-testing was completed with the remaining participants the week following the conclusion of the intervention period. Post testing was completed on only the BDI-II and the RCMAS-2, following the same procedures described for pre-testing.

By the end of the study, 11 participants had withdrawn from the study. Of those participants withdrawn from the study, 9 were discharged from the facility (3 from the yoga group, 6 from the control group); one student from the control group was withdrawn from the study due to chronic scheduling conflicts, and one yoga group participant discontinued participation due to lack of interest. Study participants were awarded one community service hour for every hour of study participation regardless of group assignment.
The yoga intervention group. The yoga intervention program consisted of three 60-minute yoga classes, weekly, for four consecutive weeks. A qualified and experienced yoga teacher taught all classes. In addition, the researcher (also a qualified yoga instructor) often provided additional instructional and behavior management support to the instructor. Classes consisted of breathing exercises, a series of physical exercises and a relaxation period. For a detailed description of the sequence of activities in the yoga intervention, please refer to Appendix C.

The control group. Control group participants met with the researcher at the beginning and end of the study period for pre- and post-testing. In addition, the researcher met with control group participants briefly during each session to check attendance. Control group participants met for a staff supervised study hall during the same time period, for the same amount of time as the yoga group participants. During the study hall period, participants were allowed to read, play games or socialize quietly.
CHAPTER 4

RESULTS

A repeated measures MANOVA was utilized to investigate the benefits of yoga practice as an additive therapeutic approach on mental health functioning after a one-month intervention period. Two dependent variables, anxiety and depression, were used. Behavior changes were not assessed, due to the unavailability of behavioral data as was previously described. Time (pre- and post-test) served as the within factor, and group (yoga or control group) served as the between factor. The means and standard deviations are presented in Table1 (See Appendix D). A significant effect for time was demonstrated, $F(2, 31) = 5.10, p = .012$, Wilk’s Lambda = .75, but the interaction effect between time and group did not reach statistical significance $F(2, 31) = 1.38, p = .268$, Wilk’s Lambda = .92. Results indicate that there was not a significant difference between the yoga and control groups on the combined dependent variable following the intervention period.

Although results from the MANOVA were not significant, further analysis of collected data was deemed reasonable for several reasons. First, the present study marks a departure from traditional treatment approaches, which have garnered inconsistent results. Any information gleaned from the present research may provide an important link to more positive treatment outcomes in the future. Second, the limited sample size and subsequent low statistical power may have rendered significant changes in this sample undetectable. Finally, the combined effects of the two dependent variables may have masked significant changes among the individual variables particularly within the interaction term.
For these reasons, the dependent variables, depression and anxiety, were considered individually using a one-way repeated measures ANOVA. In the first analysis total depression scores at Time 1 (prior to the intervention) and Time 2 (after the intervention) were compared. There was a significant effect for time, $F(1, 40) = 13.38, p = .001$, Wilk’s Lambda = .75, but not for the interaction effect between time and group $F(1, 40) = .05, p = .820$, Wilk’s Lambda = .99. In the second analysis, total anxiety scores at Time 1 and Time 2 were compared. A significant effect for time was evidenced, $F(1, 35) = 4.0, p = .053$, Wilk’s Lambda = .90. In addition, the interaction effect between time and group approached statistical significance $F(1, 35) = 3.68, p = .063$, Wilk’s Lambda = .91. Means and standard deviations for both analyses are presented in Table 3 (See Table 4 for analyses results).

To follow the trend toward significant results of the repeated measures ANOVA on total anxiety scores, I conducted a repeated measures MANOVA to analyze these findings more discretely by considering the results of the individual anxiety subscales (Worry, Social Anxiety, Physiological Anxiety) which are combined to make up the total anxiety score. Time (pre- and post-test) served as the within factor, and group (yoga or control group) served as the between factor. Means and standard deviations are presented in Table 5. As was expected from the previous analysis, a significant effect for time was demonstrated for the combined anxiety variable, $F (3, 33) = 2.92, p = .049$, Wilk’s Lambda = .79, as well as for the interaction effect between time and group $F (3, 33) = 3.74, p = .020$, Wilk’s Lambda = .75. When the results for the individual scales were considered separately, the only difference to reach statistical significance for the time and group interaction was the Worry subscale $F (1, 35) = 8.82, p = .005$ (see Figure 2). In
order to explore this relationship further, post hoc analyses of simple effects were conducted.

First, one-way repeated measures ANOVA’s were utilized to determine if the yoga group and control group’s post-test Worry scores were significantly different from their own pre-test Worry scores. Results indicated that both groups had significant changes in Worry scores over time (yoga group: $F(1, 22) = 7.56, p = .012$; control group: $F(1, 17) = 6.44, p = .021$), and that the yoga group’s Worry scores decreased over time, while the control group’s Worry scores increased over time.

Next, one-way ANOVA’s were utilized to determine if Worry scores were significantly different between the groups at pre- and post-test. Results indicate that the groups Worry scores were not significantly different from each other at either time (Time 1: $F(1, 41) = 1.4, p = .245$; or Time 2: $F(1, 40) = .98, p = .354$).

Finally, the moderating effects of callous-unemotional (CU) traits on anxiety outcomes were examined utilizing two-way repeated measures ANOVA (only anxiety outcomes were utilized because results for the depression outcome were not significant). CU group membership was determined by each individual’s total ICU score in relation to the group mean score. Total ICU scores above the mean were considered to be high, while scores below the mean were considered to be low. Total anxiety scores with time (pre- and post-test) served as the within factor, and both study group (yoga or control group), and CU group (high or low traits) membership served as the between group factors. A significant main effect for time $F(1, 33) = 4.75, p = .036$, Wilk’s Lambda = .874 was detected. No other significant effects for interaction of time and group(s) were detected.
Although the interaction between time, study group and CU group was not statistically significant, it is interesting to note that inspection of cell means revealed that changes in anxiety scores were consistent with hypothesis 2b, which postulated that yoga group participants with lower CU scores would evidence greater improvements on anxiety outcomes than those with high CU scores (See Figure 3; At Time 1 the yoga group/low CU mean anxiety score was 8.1; at Time 2 their mean score was 4.0; At Time 1 the yoga group/high CU mean anxiety score was 12.5; at Time 2 their mean score was 10.2). Although due to the lack of statistical significance this result is merely suggestive, it seems worthy to consider that the same study conducted with a greater number of participants and greater statistical power may have detected an important relationship.
Primary Findings

The purpose of this study was to investigate the benefits of a yoga intervention as an additive therapeutic approach on the anxiety, depression and behavioral problems of conduct-disordered adolescents in residential treatment. In addition, the moderating effects of callous-unemotional (CU) traits, traits associated with a more severe presentation of conduct disorder, on outcome measures were assessed. Although the primary hypothesis tests in this study were not statistically significant, the results suggest that practicing yoga may afford greater reductions in anxiety, but not depression, among conduct-disordered adolescent boys in residential treatment. In addition, results are also suggestive of a relationship between levels of CU traits and outcomes, in that among yoga group participants, those with low CU traits evidenced greater reductions in anxiety than participants with high CU traits.

The trend demonstrated in the present study which suggests that conduct disordered adolescents boys in residential treatment who practice yoga evidence greater reductions in anxiety than those who do not, is consistent with previous research, which has documented the benefits of yoga practice with various populations including elementary school age children (Stueck & Gloeckner, 2003; Telles et al., 1997) and college students (Khumar et al., 1993; Woolery et al., 2004). It is interesting to note that the trend towards lower anxiety scores for yoga group participants demonstrated in the present study was statistically evident in spite of indications that participants underreported anxiety symptoms in general, with total anxiety scores for all participants,
in both groups, falling into the lowest score range both at pre- and post-test. The level of anxiety reported in the present study is incongruent with reports of 60-70% rates of anxiety disorders in clinic referred or institutionalized samples of conduct-disordered children and adolescents (see Russo & Beidel, 1993; Zoccolillo, 1992, for reviews).

The failure of the yoga group to evidence significantly greater reductions in depression than the control group was unexpected. Based on the results of previous studies, which included children (Platania-Solazzo et al., 1992), college students (Berger & Owen, 1992; Khumar et al., 1993; Woolery et al., 2004) and psychiatric patients (Lavey et al., 2005) significant improvements were expected. Although none of the aforementioned research specifically reported improvements in depressive symptoms in conduct-disordered youth following yoga practice, it was anticipated that benefits would extend to this subpopulation as it did with anxiety.

It is unclear why the anticipated benefits of yoga on depression were not extended to the present study’s population. It may be that differences in the study populations account for differences in reporting depressive symptoms. For example the conduct-disordered youth in the present study may have been more defensive than college student volunteers about identifying with negative statements about themselves. Resulting depression scores may not present an accurate symptom profile, and would be less likely to obtain meaningful results over time. In addition, mean BDI-II scores were low to begin with, falling in the “mild” range of depression scores at pre-test (yoga group M = 15.67; control group M=13.26) and dropping to the “minimal” range (yoga group M = 9.87; control group M=8.72) at post-test. Only a small percentage of participants scored in the moderate depression range (21% at pre-test and 14% at post test) or severe depression
range (7% at pre-test, and 0% at post test) at pre- and post-test. These results are inconsistent with previous reports indicating that depression rates, suicidal thoughts, suicide attempts, and suicide itself are all higher in children diagnosed with a conduct disorder (Shaffer et al., 1996). It may be that these participants underreported depressive symptoms, were not experiencing depressive symptoms, or that the BDI-II could not adequately capture their symptoms.

Results from the analysis that assessed the moderating effects of callous-unemotional traits on the anxiety measure (only anxiety was considered because results for the depression measure were not significant) were also non-significant, but revealed an interesting trend. Specifically, examination of individual cell means revealed that the yoga/low CU group’s mean anxiety score dropped by more than half from pre-test to post-test (pre-test=8.1; post-test=4.0), while the yoga/high CU group evidenced less than a 20% decrease (pre-test=12.5; post-test=10.2). The trend demonstrated in the present study is consistent with previous research in the association of CU traits with poorer treatments outcomes (see Frick & Dickens, 2006, for review). Contrary to previous research though, *CU traits were not indicative of non-compliance to treatment*. In fact participants with high CU traits attended slightly more yoga sessions than participants with low CU traits (High CU group mean sessions attended= 9.09, SD 3.18; Low CU group mean sessions attended= 8.77, SD 3.18).

In addition to results for the primary hypotheses, the present study has also identified several other interesting findings. One interesting finding that emerged suggests that yoga practice may affect one aspect of anxiety more than others. This effect was demonstrated when the anxiety subscales were considered individually and only the
Worry (not Physiological Anxiety or Social Anxiety) subscale demonstrated significant differences for the time and group interaction. One explanation for the Worry subscale phenomenon is that perhaps it was the most relevant of the subscales for this group of youth. According to the RCMAS-2 technical manual (Reynolds & Richmond, 2008), the Worry subscale is comprised of vague, ill-defined items that are obsessive in nature, and relate to fears of being hurt or emotionally isolated. Higher scores may indicate that the youth has fears or concerns related to environmental pressures, and that the youth may internalize these fears and become subsequently overburdened by trying to relieve this anxiety. Considering the context of the present study, it seems plausible that a group of isolated, institutionalized adolescents with legal problems would identify with these items.

It is unclear exactly how the practice of yoga may have specifically alleviated worrying, but it may be that the attentiveness and mental and physical coordination required to perform the various yoga exercises interrupted participants’ negative ruminations and replaced it with feelings of well-being. Furthermore, the consistent yoga practice provided by the intervention may have first provided yoga group participants with a welcome respite from the constant worries of living in a threatening environment, and then over time, and repeated practice evolved into increased generalized feelings of well-being.

Another compelling finding from the study was that in spite of the non-compliant nature of conduct-disordered youth (APA, 2001; Ipser & Stein, 2007), participants in this study were very compliant with the treatment protocol, attending an average of nine out of the twelve total sessions offered. This entailed presenting for treatment three times a
week for four weeks, in contrast to traditional individual and family therapy that
generally meets one time a week. The yoga sessions were offered during lunch, which
was inconvenient, and provided no benefit of missing class or other less desirable
activities.

Participants were also generally very positive about participation. Since I assisted
the yoga instructor in all classes, I had the opportunity to observe participants’ reactions
and engagement in the different components of the class. It was astonishing to see how
quickly and enthusiastically these youth engaged in the various aspects of the class. For
example, each class traditionally begins with a brief meditation and breathing exercise,
followed by the chanting of “OM”. Following a brief period of self-consciousness, the
group as a whole took the meditation and chanting period very seriously. Any individual
aberrant behavior was quickly extinguished through positive peer pressure.

In addition, it was interesting to observe how engaged these youth were in
performing the *asanas* or yoga poses. Obtaining and holding yoga poses requires interest
and openness, listening and following directions, concentration and self-control, and
coordination and strength. Although conduct-disordered youth generally demonstrate
deficits in many of these areas, these youth demonstrated the willingness to regulate their
behavior and emotions consistently for three weekly classes over a one-month period.

Finally, it would appear that participants felt positive about the skills they were
acquiring for several reasons. First, due to the attendance and positive participation as
described above, and second, due to the fact that as information about the yoga classes
was spread throughout the campus by participants, other students approached the
researcher and asked to participate.
It is uncertain what factor or factors led to these positive responses from this group of youth, but it seems likely that participants must have experienced significant subjective rewards such as feelings of relaxation and well-being, such as those described in Peck et al., (2007), which served as a positive reinforcement for continued participation. It is also possible that the participants may have been responding to the positive attention of two nurturing females in non-authority positions, and the chance to participate in a novel activity.

Study Implications

The results of this study contribute to the existing literature in two ways. First, it has tentatively extended current treatment outcome research by indicating that there may be some benefits of yoga practice for the treatment of anxiety in youth with severe behavioral problems. Second, results from this study demonstrate the feasibility of yoga as an intervention with this treatment resistant population. Although these are the findings of one small study, when considering the difficulty of engaging this population in general, the high drop-out rate/non-compliance rate of most current treatment modalities, and the negative long-term prognosis that is associated with conduct disordered youth, further investigation into the benefits and usefulness of yoga as an alternative or complementary therapy appear to be warranted.

Study Limitations and Future Directions

This study has several limitations. First, although study participants were generally compliant and enthusiastic about participating in yoga, this does not imply that groups of conduct-disordered youth became easy to work with through the utilization of yoga as an intervention. Behavioral and interpersonal problems among participants were
not uncommon, but they were manageable. Having an experienced yoga instructor, and an assistant (who is a yoga instructor as well as an experienced clinician with conduct-disordered youth), in the room made it possible to keep participants on task in addition to redirecting behavioral problems. This is an important consideration for future studies.

Second, this study was also limited by the methods utilized for assessing levels of anxiety, depression, and behavior problems. First, in future studies, a qualified person, other than the primary investigator, should administer assessments to avoid any unintentional biases this situation may create. Second, only self-report methods were utilized for assessing anxiety, depression and CU traits. Although both the RCMAS-2 and the BDI-II are well-established measures, results from a self-report measure may not have provided an accurate symptom profile due to the inherent defensiveness of this population. Collateral information or assessments completed by teachers or other informed individuals such as case workers or counselors would have been helpful in providing a more complete symptom profile. Furthermore, engaging these individuals in the research and assessment process may have created more of a collaborative effort, and subsequently resulted in more valid assessment data. Finally, although the use of institutional methods to assess for behavioral problems was planned, these records were subsequently unavailable due to unanticipated program changes. In the future, it would be prudent to prepare for these kinds of problems by multiple methods of data collection for each important variable.

A third limitation of the present study was the lack of complete diagnostic information for each participant. Although the majority of participants were engaged in mental health services in the program, most participants carried diagnoses including
ADHD, Disruptive Behavior Disorder, Oppositional Defiant Disorder, Conduct Disorder, and various Substance Abuse Disorders. Only a few of the study participants were diagnosed with mood or anxiety disorders. This finding is incongruent with previous research which indicates that symptoms of internalizing disorders such as depression and anxiety are evidenced at a higher rate in children with ODD/CD and ADHD/CD (Eiraldi, Power, & Nezu, 1997; Loeber, Burke, et al., 2000; Moffitt, 1993); that depression rates, suicidal thoughts, suicide attempts, and actual suicide are all reportedly higher in children diagnosed with conduct disorder (Shaffer et al., 1996); and that anxiety disorders were reported in 60-70% of clinic referred or institutionalized samples of conduct-disordered children and adolescents (see Russo & Beidel, 1993; Zoccolillo, 1992, for reviews). Since it was unknown if most participants met criteria for any mood or anxiety disorder, it is impossible to know how these comorbid disorders may have affected treatment outcomes.

Fourth, this study is also limited by the use of only pre- and post-test assessments. The collection of follow-up data would have provided information regarding the lasting effects of the treatment.

Finally, the present study was significantly limited by its small sample size. A larger numbers of participants would have increased statistical power and perhaps the ability to find differences among groups.

Although the results of the present study are preliminary at best, they are compelling. Future studies need to assess the willingness of other, larger groups of conduct-disordered youth to participate in yoga. In addition, due to the nature of this population, future studies should use complementary assessment methods, in order to
insure more complete diagnostic profiles, and therefore produce a clearer picture of the benefits of yoga practice. In addition, future studies should assess if conduct-disordered youth are more amenable to one style of yoga versus another. Finally the long-term effects of a yoga intervention should be assessed to determine if participants continue to practice yoga on their own following the intervention period and how the trajectory of the individual’s disorder was affected by yoga practice.
APPENDIX A

University of Miami
CONSENT TO PARTICIPATE IN A RESEARCH STUDY
The effects of yoga on symptoms associated with conduct disorder

The following information describes the research study in which your child is being asked to participate. Please read the information carefully. At the end, you will be asked to sign if you agree to allow your child to participate.

PURPOSE OF STUDY:
The purpose of this study is to find out if practicing yoga improves the emotional and behavioral problems adolescents with severe behavioral problems or conduct disorder experience. Your son is being asked to participate in this research study because he is in a program due to his severe behavioral problems.

PROCEDURES:
If you agree to have your son participate in the study, he will be asked to participate in the following activities:

1. First, the researcher will provide your son with the opportunity to learn about the study and what he would be asked to do if he chooses to participate. This includes having the opportunity to ask questions, review an agreement or assent form, and decide whether or not he wishes to participate. Your son will be informed that participating or declining participation will in no way affect his expected progress or status in the Baypoint program. In addition, your son will be informed that if he chooses to participate, Baypoint will allow him to apply the time spent participating in study activities (including filling out questionnaires and participation in either study group) towards his total community service hours required as part of the Baypoint program. Points are earned at the end of each session. Points will not be earned if your son is excused from the session at any time due to disruptive behavior.

2. If your son agrees to participate, he will be asked to complete three short questionnaires about his emotional and behavioral functioning at the beginning of the research, and two of the same short questionnaires about his emotional functioning at the end of the research. Completing these questionnaires will take about an hour.

3. In addition, before the research begins, your son’s mental health diagnostic information, and information regarding his daily behavior, school status and progress will be gathered from Baypoint records. Information regarding his daily behavior will be gathered again at the end of the research.

4. Your son will then be randomly (like a coin toss) assigned to one of two study groups. Both groups will meet for sixty minutes, three times a week, for one month. One group will practice yoga with an instructor; the other group will meet for a supervised group study session. Community service points will be awarded
equally for either group assignment. The length of time your son is expected to participate in the study is approximately 8 weeks after assent has been provided.

**RISKS AND/OR DISCOMFORTS:**
This study may involve some risks or discomfort to participants depending on group assignment. If your son is assigned to the study hall group, there is very minimal physical risk expected. If your son is assigned to the yoga group, there are minimal physical risks associated with participation. Physical risks may include: 1) Minimal physical discomfort during practice, and/or soreness or muscle fatigue following practice; 2) The risk of physical injury is possible but unlikely. Although there is minimal risk of physical risk and/or injury, in comparison, these risks are expected to be less likely to occur than the discomforts/injuries associated with training for football, basketball or other traditional sports. In case of physical injury there is a nurse on staff at Baypoint schools.

It is also possible that your son may experience some emotional discomfort during and/or after the completion of study questionnaires which involve the identification of emotional and behavioral problems he may currently be experiencing. Your son will be advised that he may skip any question he does not wish to answer. In case of emotional discomfort, there are mental health professionals on staff at Baypoint schools who are available to meet with your son and address any emotional discomfort he may be experiencing.

**BENEFITS:**

If your son is assigned to the yoga group, it is possible that he will benefit directly from participating in this study by having increased feelings of relaxation and well-being which most people experience after just one yoga session. In addition, improvements in emotional functioning and behavior are also expected following participation due to results from previous research.

**CONFIDENTIALITY:**
In order to safeguard your son’s confidentiality, the following procedures will be followed:

1. ID numbers will be assigned to all participants, and used for identification purposes on all documents and computer entries. The master list which links individual and their ID numbers will be kept in a locked file cabinet in the home of Kym McCabe, a key research team member, and destroyed as soon as possible.
2. All study documents will be kept in a locked cabinet in the home of Kym McCabe, and accessible only to research collaborators. Computer files will be password protected and will identifiable by code numbers only.
3. All results from this study will be reported in group, not individual differences.

By signing this consent, you authorize the Investigators(s) and their staff to access your child’s school records as may be necessary for purposes of this study.
COSTS:
There are no costs associated with your child's participation in this study.

Although injury is unlikely, if injury occurs, treatment will in most cases be available. If your child has insurance, your child’s insurance company may or may not pay for these costs. If your child does not have insurance, or if your child’s insurance company refuses to pay, you will be expected to pay. Funds to compensate for pain, expenses, lost wages and other damages caused by injury are not routinely available.

RIGHT TO DECLINE OR WITHDRAW:
Your child’s participation in this study is voluntary. Your child is free to refuse to participate in the study or withdraw his consent at any time during the study. Your child’s withdrawal or lack of participation will not affect his status or progress in the Baypoint program. The investigator reserves the right to remove your child from the study without your child’s consent at such time that they feel it is in the best interest for your child.

CONTACT INFORMATION:
You may contact Dr. Blaine Fowers, the primary investigator for this study at (305) 284-3001. He will gladly answer any questions you may have concerning the purpose, procedures, and outcome of this project. If you have questions about your rights as a research subject you may contact Human Subjects Research Office at the University of Miami, at (305) 243-3195.

PARTICIPANT AGREEMENT:
I have read the information in this consent form and agree to allow my child to participate in this study. I have had the chance to ask any questions I have about this study, and they have been answered for me. I am entitled to a copy of this form after it has been read and signed.

____________________________  ____________________
Name of Child Participant  Date

____________________________  ____________________
Signature of Parent/Legal Guardian  Date

____________________________  ____________________
Signature of person obtaining consent  Date
University of Miami

YOUTH ASSENT TO PARTICIPATE IN A RESEARCH STUDY

The effects of yoga on symptoms associated with conduct disorder

Primary Investigator: Dr. Blaine Fowers
tel: (305) 284-3001

We are doing a research study about yoga and kids with severe behavioral problems. We want to find out if practicing yoga helps kids with these kinds of problems feel better and act better. The reason we are asking you is because you are in a program/Baypoint because of problems you have had.

If you decide you want to be part of this study, you will be asked to participate in the following activities:

1. Complete three short forms about your feelings, and how you think and act. The forms will be read aloud to you, and the whole thing should take about an hour.
2. Allow us to gather information from Baypoint records about your behavior, any emotional problems you may be having, your school status and progress.
3. We will then randomly assign (like a coin toss) all boys who have agreed to participate to one of two study groups. Both groups will meet for sixty minutes, three times a week, for one month. One group will practice yoga with an instructor; the other group will meet for a supervised group study session.
4. After the one month of group activities, we will ask you to fill out the two forms about your feelings again. We will also look at Baypoint’s records to see how you have been behaving.
5. The whole study, including one month of group participation and filling out the forms before and after, will take about eight weeks.

Baypoint will award you community service points for the time you participated in the study filling out questionnaires or in group activity. For example, if you participated for 24 hours, you will be awarded 24 community service points. If you do not attend a session, for any reason, or are excused for disruptive behavior, you will not be awarded points for that session.

There are some things about this study you should know:

1. Filling out forms about your feelings, might make you feel uncomfortable. If that happens to you, Baypoint counselors are available to help you work out your feelings.
2. If you are in the study hall group, it not likely that you will feel physically uncomfortable or get hurt.
3. If you are in the yoga group, you could feel some physical discomfort during or after practice. This is because you are probably going to be doing physical activities you are not used to. It is also possible, but not likely, that you could get hurt. If you get hurt, there is a nurse on staff at Baypoint schools. If you need more care, your insurance may or may not cover these expenses. Your parents will need to pay for your care if your insurance will not cover these expenses.
Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. If you are in the yoga group, we think you might benefit by feeling more positive and relaxed following each practice.

When we are finished with this study we will write a report about what was learned. This report will not include your name or that you were in the study.

You do not have to be in this study if you do not want to be. If you decide to stop after we begin, that’s okay too. No one will be mad at you if you decide not to do this study. If you do not participate in this study, it will not affect your status or progress at Baypoint. You may ask questions about the study at any time.

Do you have any questions?

If you decide you want to be in this study, please sign your name.

I agree ______ I do not agree ______ to participate in this study which I have read or which has been explained to me by ______________________

_____________________________________________________________(Sign your name here) (Date)

_____________________________________________________________(Signature of Person Obtaining Assent) (Date)
Circle one answer for each sentence. Please press hard when marking your responses.

1. Often I feel sick in my stomach. ........................................... Yes No
2. I am nervous. ................................................................ Yes No
3. I often worry about something bad happening to me. ...... Yes No
4. I fear other kids will laugh at me in class. ......................... Yes No
5. I have too many headaches. .............................................. Yes No
6. I worry that others do not like me. ...................................... Yes No
7. I wake up scared sometimes. ............................................ Yes No
8. I get nervous around people. ............................................ Yes No
9. I feel someone will tell me I do things the wrong way. ...... Yes No
10. I fear other people will laugh at me. ................................. Yes No

Continue with Item 11 unless you have been told to stop here.

11. I have trouble making up my mind. ................................. Yes No
12. I get nervous when things do not go the right way for me. Yes No
13. Others seem to do things easier than I can. ..................... Yes No
14. I like everyone I know. ................................................... Yes No
15. Often I have trouble getting my breath. ......................... Yes No
16. I worry a lot of the time. ............................................... Yes No
17. I feel bad if people laugh at me. ................................. Yes No
18. I am afraid of a lot of things. ..................................... Yes No
19. I am always kind. ......................................................... Yes No
20. I get mad easily. ......................................................... Yes No
21. I worry about what my parents will say to me. ................. Yes No
22. I feel that others do not like the way I do things. ............. Yes No
23. I am afraid to give a talk to my class. ........................... Yes No
24. I always have good manners. ...................................... Yes No

What I Think and Feel (RCMAS-2)
AutoScore™ Form

Cecil R. Reynolds, Ph.D., and Bert O. Richmond, Ed.D.

Directions
First fill in the background information. If you don’t know your ID number, ask your examiner.

The sentences on this form tell how some people think and feel about themselves. Read each sentence carefully, then circle the word that shows your answer. Circle Yes if you think the sentence is true about you. Circle No if you think it is not true about you. Give an answer for every sentence, even if it is hard to choose one that fits you. Do not circle both Yes and No for the same sentence. If you want to change an answer, draw an X through your first answer and then circle your new choice.

There are no right or wrong answers. Only you can tell us how you think and feel about yourself. Remember, after you read each sentence, ask yourself, “Is it true about me?” If it is, circle Yes. If it is not, circle No.

Date: __________________

Name or ID number: __________________

Age: ______ Grade _____ Gender: [ ] Girl [ ] Boy

Race/Ethnicity: [ ] American Indian/Alaska Native
[ ] Asian
[ ] Black/African American
[ ] Hispanic/Latino
[ ] Native Hawaiian/Pacific Islander
[ ] White
[ ] Other

School: __________________

Examiner: __________________

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25. It is hard for me to get to sleep at night. ......................................................... Yes No
26. I worry about what other people think about me. ............................................. Yes No
27. I feel alone even when there are people with me. ............................................. Yes No
28. I get teased at school. ......................................................................................... Yes No
29. I am always good. .............................................................................................. Yes No
30. My feelings get hurt easily. ................................................................................ Yes No
31. My hands feel sweaty. ......................................................................................... Yes No
32. I worry about making mistakes in front of people. ........................................... Yes No
33. I am always nice to everyone. ............................................................................ Yes No
34. I am tired a lot. .................................................................................................... Yes No
35. I worry about what is going to happen. .............................................................. Yes No
36. Other people are happier than I am. ................................................................. Yes No
37. I am afraid to speak up in a group. ..................................................................... Yes No
38. I tell the truth every single time. .......................................................................... Yes No
39. I have bad dreams. .............................................................................................. Yes No
40. I get angry sometimes. ....................................................................................... Yes No
41. I worry about being called on in class. .............................................................. Yes No
42. I worry when I go to bed at night. ....................................................................... Yes No
43. It is hard for me to keep my mind on my schoolwork. ....................................... Yes No
44. I sometimes say things I should not say. ......................................................... Yes No
45. I worry about someone beating me up. .............................................................. Yes No
46. I wiggle in my seat a lot. ....................................................................................... Yes No
47. A lot of people are against me. ........................................................................... Yes No
48. I have told a lie. .................................................................................................... Yes No
49. I worry about saying something dumb. ............................................................. Yes No
Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

<table>
<thead>
<tr>
<th>1. Sadness</th>
<th>6. Punishment Feelings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I do not feel sad.</td>
<td>0 I don’t feel I am being punished.</td>
</tr>
<tr>
<td>1 I feel sad much of the time.</td>
<td>1 I feel I may be punished.</td>
</tr>
<tr>
<td>2 I am sad all the time.</td>
<td>2 I expect to be punished.</td>
</tr>
<tr>
<td>3 I am so sad or unhappy that I can’t stand it.</td>
<td>3 I feel I am being punished.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Pessimism</th>
<th>7. Self-Dislike</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I am not discouraged about my future.</td>
<td>0 I feel the same about myself as ever.</td>
</tr>
<tr>
<td>1 I feel more discouraged about my future than I used to be.</td>
<td>1 I have lost confidence in myself.</td>
</tr>
<tr>
<td>2 I do not expect things to work out for me.</td>
<td>2 I am disappointed in myself.</td>
</tr>
<tr>
<td>3 I feel my future is hopeless and will only get worse.</td>
<td>3 I dislike myself.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Past Failure</th>
<th>8. Self-Criticalness</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I do not feel like a failure.</td>
<td>0 I don’t criticize or blame myself more than usual.</td>
</tr>
<tr>
<td>1 I have failed more than I should have.</td>
<td>1 I am more critical of myself than I used to be.</td>
</tr>
<tr>
<td>2 As I look back, I see a lot of failures.</td>
<td>2 I criticize myself for all of my faults.</td>
</tr>
<tr>
<td>3 I feel I am a total failure as a person.</td>
<td>3 I blame myself for everything bad that happens.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>4. Loss of Pleasure</th>
<th>9. Suicidal Thoughts or Wishes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I get as much pleasure as I ever did from the things I enjoy.</td>
<td>0 I don’t have any thoughts of killing myself.</td>
</tr>
<tr>
<td>1 I don’t enjoy things as much as I used to.</td>
<td>1 I have thoughts of killing myself, but I would not carry them out.</td>
</tr>
<tr>
<td>2 I get very little pleasure from the things I used to enjoy.</td>
<td>2 I would like to kill myself.</td>
</tr>
<tr>
<td>3 I can’t get any pleasure from the things I used to enjoy.</td>
<td>3 I would kill myself if I had the chance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Guilty Feelings</th>
<th>10. Crying</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I don’t feel particularly guilty.</td>
<td>0 I don’t cry anymore than I used to.</td>
</tr>
<tr>
<td>1 I feel guilty over many things I have done or should have done.</td>
<td>1 I cry more than I used to.</td>
</tr>
<tr>
<td>2 I feel quite guilty most of the time.</td>
<td>2 I cry over every little thing.</td>
</tr>
<tr>
<td>3 I feel guilty all of the time.</td>
<td>3 I feel like crying, but I can’t.</td>
</tr>
</tbody>
</table>
11. Agitation
0  I am no more restless or wound up than usual.
1  I feel more restless or wound up than usual.
2  I am so restless or agitated that it's hard to stay still.
3  I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest
0  I have not lost interest in other people or activities.
1  I am less interested in other people or things than before.
2  I have lost most of my interest in other people or things.
3  It's hard to get interested in anything.

13. Indecisiveness
0  I make decisions about as well as ever.
1  I find it more difficult to make decisions than usual.
2  I have much greater difficulty in making decisions than I used to.
3  I have trouble making any decisions.

14. Worthlessness
0  I do not feel I am worthless.
1  I don’t consider myself as worthwhile and useful as I used to.
2  I feel more worthless as compared to other people.
3  I feel utterly worthless.

15. Loss of Energy
0  I have as much energy as ever.
1  I have less energy than I used to have.
2  I don't have enough energy to do very much.
3  I don’t have enough energy to do anything.

16. Changes in Sleeping Pattern
0  I have not experienced any change in my sleeping pattern.
1a  I sleep somewhat more than usual.
1b  I sleep somewhat less than usual.
2a  I sleep a lot more than usual.
2b  I sleep a lot less than usual.
3a  I sleep most of the day.
3b  I wake up 1-2 hours early and can’t get back to sleep.

17. Irritability
0  I am no more irritable than usual.
1  I am more irritable than usual.
2  I am much more irritable than usual.
3  I am irritable all the time.

18. Changes in Appetite
0  I have not experienced any change in my appetite.
1a  My appetite is somewhat less than usual.
1b  My appetite is somewhat greater than usual.
2a  My appetite is much less than before.
2b  My appetite is much greater than usual.
3a  I have no appetite at all.
3b  I crave food all the time.

19. Concentration Difficulty
0  I can concentrate as well as ever.
1  I can’t concentrate as well as usual.
2  It’s hard to keep my mind on anything for very long.
3  I find I can’t concentrate on anything.

20. Tiredness or Fatigue
0  I am no more tired or fatigued than usual.
1  I get more tired or fatigued more easily than usual.
2  I am too tired or fatigued to do a lot of the things I used to do.
3  I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
0  I have not noticed any recent change in my interest in sex.
1  I am less interested in sex than I used to be.
2  I am much less interested in sex now.
3  I have lost interest in sex completely.

NOTICE: This form is printed with both blue and black ink. If your copy does not appear in blue, it has been photocopied in violation of copyright laws.

Subtotal Page 2
Subtotal Page 1
Total Score
ICU
(Youth Version)

Name: ______________________

Date Completed: ______________

**Instructions:** Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number (0-3) for each statement. Do not leave any statement unrated.

<table>
<thead>
<tr>
<th></th>
<th>Not at all true</th>
<th>Somewhat true</th>
<th>Very true</th>
<th>Definitely True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I express my feelings openly.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. What I think is “right” and “wrong” is different from what other people think.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I care about how well I do at school or work.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I do not care who I hurt to get what I want.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I feel bad or guilty when I do something wrong.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I do not show my emotions to others.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I do not care about being on time.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I am concerned about the feelings of others.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I do not care if I get into trouble.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I do not let my feelings control me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. I do not care about doing things well.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. I seem very cold and uncaring to others.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. I easily admit to being wrong.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14. It is easy for others to tell how I am feeling.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15. I always try my best.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16. I apologize (“say I am sorry”) to persons I hurt.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17. I try not to hurt others’ feelings.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18. I do not feel remorseful when I do something wrong.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. I am very expressive and emotional.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20. I do not like to put the time into doing things well.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>The feelings of others are unimportant to me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------</td>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td></td>
<td>I hide my feelings from others.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I work hard on everything I do.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I do things to make others feel good.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Unpublished rating scale by Paul J. Frick, Department of Psychology, University of New Orleans (pfrick@uno.edu).
Bay Point Schools
Student (Behavior Management & Accountability) Report
Report by Student Alphabetical Order (for period of 19 May - 4 June, 2006) (Finalized Report)
Prepared by: Mr. Charles J. Boldwyn

Shift Managers:
AM: Mr. Stanley Hyppolite
PM: Mr. Ryan Johnson
Night: Mr. Anthony Ancrum

Case Managers:
Mr. Mike Magri-Director
Mr. Donald Stuckey
Ms. Mildred Washington

"Dedicated to building a safer community through positive peer pressure & education, one youth at a time."

<table>
<thead>
<tr>
<th>(Positive Reinforcement Hours)</th>
<th>Positive Reinforcement Points</th>
<th>Major Code of Conduct Violations (Logs)</th>
<th>Code of Conduct Violations</th>
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<tbody>
<tr>
<td>(LE = Log Entry) (U) = Unknown</td>
<td>(PCH) = Phone Call Home (1/week, family only) per telephone calling records prepared &amp; submitted weekly by Counselors.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
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</tbody>
</table>

Academics
(as of 5/25 per Mr. Wyckoff)
Grades will remain posted until grade review. Mr. Boldwyn on a sick leave or by a mass report email
APPENDIX C

Yoga class protocol

The yoga intervention will consist of 12 individual yoga classes. Participants will attend three, one-hour yoga classes weekly, for four weeks. Yoga instruction will be provided by a certified yoga instructor.

All classes will include breathing exercises (Pranayama), physical exercise (Asana) and meditation. Each session will commence with a series of flowing physical postures known as sun salutations A & B. Poses and sequencing may be modified to meet any physical limitations of participants. Modifications in sequencing and individual poses are not considered a hindrance to achieving the full benefits of practice.

Sun Salutation A consists of:

- Samasthithi _standing
- Urdhva Hastasana – arms up
- Uttanasana – forward bend
- Ardha Uttansana – half forward bend
- Chaturanga Dandasana – bottom of a push up
- Urdhva Mukha Svanasana – upward dog
- Adho Mukha Svanasana – downward facing dog – 5 breaths
- Ardha Uttanasana- half forward bend
- Uttanasana – forward bend
- Urdhva Hastasana – arms up
- Samasthiti – standing
Sun Salutation B consists of:

Samasthithi _ standing
Utkatasana – chair pose
Uttanasana – forward bend
Ardha Uttansana – half forward bend
Chaturanga Dandasana – bottom of a push up
Urdhva Mukha Svanasana – upward dog
Adho Mukha Svanasana – downward facing dog
Virabhadrasana 1  warrior 1 - (rt. foot forward )–
Chaturanga Dandasana – bottom of a push up
Urdhva Mukha Svanasana – upward facing dog
Adho Mukha Svanasana – downward facing dog
Virabhadrasana 1 – warrior 1 – (lt. foot forward)
Chaturanga Dandasana – bottom of a push up
Urdhva Mukha Svanasana – upward facing dog
Adho Mukha Svanasana – downward facing dog – 5 breaths
Ardha Uttansana – half forward bend
Uttanasana – forward bend
Utkatasana – chair pose
Samasthithi

Each sun salutation is repeated 5 times.
After completing the sun salutations a series of standing, sitting, inversions and cooling poses are practiced. Several poses are selected from each category. Each pose is held for approximately 5 breaths:

Standing -

- Padangusthasana – thumb to foot
- Pada Hastasna – hand to foot
- Utthita Trikonasana – extended triangle pose
- Parivrtta Trikonasana – revolved triangle pose
- Utthita Parsvakonasana – extended side angle pose
- Parivrtta Parsvakonasana – revolved side angle pose
- Prasarita Padottansana A,B,C,D – spread foot stretching pose
- Parsvottanasana – sideways stretching pose
- Utthita Hasta Padangusthasana – extended hand thumb foot pose)
- Ardha Baddha Padmottanasana – half bound lotus stretching pose
- Utkatasana -chair
- Virabhadrasana 1 & 2 – warrior

Seated-

- Paschimottanasana A,B,C,D – west (back) stretching pose
- Purvottanasana – east (front) stretching pose
- Ardha Baddha Padma Paschimottanasana – half bound lotus forward stretch
- Triang Mukhaekapada Paschimottanasana –one foot face back forward stretch
- Janu Sirsasana A,B,C – head to knee pose
- Marichyasana A, B, C, D -
Navasana – boat pose

Bhujapidasana

Kurmasana – tortoise sleeping pose

Garbha Pindasana -

Kukkutasana – rooster pose

Baddha Konasana – bound angle pose

Upavishta Konasana – seated angle pose

Supta Konasana – sleeping angle pose

Supta Padangusthasana– sleeping thumb to foot pose

Supta Parsvasahita – lateral sleeping thumb to foot pose

Udbhaya Padangusthasana – both thumbs to feet pose

Urdhva Mukha Paschimottanasana – upward facing forward stretch pose

Setu Bandhasana – bridge pose

Urdhva Dhanurasana – upward facing bow pose

Inversions -

Salamba Sarvangasana – shoulder stand

Halasana – plough pose

Karnapidasana – knees to ear pose

Urdhva Padmasana – elevated lotus pose

Pindasana – embryo pose

Matsyasana – fish pose

Uttana Padasana – extended foot pose

Sirsasana – head stand
Cool down -

Baddha Padmasana – bound lotus pose

Yogamudra – yoga seal

Padmasana – lotus pose

Utpluthih – lifted lotus pose

Savasana – corpse pose

Following Savasana participants will be instructed to take a comfortable seated position and will be guided through a simple Pranayama (breathing exercise). The Pranayama exercise will consist of inhaling for the count of 4 and exhaling for the count of 4, for 10 rounds. Following Pranayama, participants will be instructed to continue sitting for a simple meditation consisting of focusing on the breath and stilling the body for approximately five minutes.
Table 1

Means Scores and Standard Deviations for measures of Anxiety and Depression at Pre- and Post-Test

<table>
<thead>
<tr>
<th>Measure</th>
<th>Group</th>
<th>Pre-Test</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>RCMAS-2</td>
<td>Total Yoga group</td>
<td>10.6</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>Yoga/High CU</td>
<td>12.5</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>Yoga/Low CU</td>
<td>8.1</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>Total Control group</td>
<td>8.9</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>Control/High CU</td>
<td>6.2</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>Control/Low/CU</td>
<td>10.2</td>
<td>10.4</td>
</tr>
<tr>
<td>BDI-II</td>
<td>Total Yoga group</td>
<td>15.5</td>
<td>8.9</td>
</tr>
<tr>
<td></td>
<td>Yoga/High CU</td>
<td>18.8</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Yoga/Low CU</td>
<td>11.1</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>Total Control group</td>
<td>12.4</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>Control/High CU</td>
<td>11.0</td>
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</tr>
<tr>
<td></td>
<td>Control/Low/CU</td>
<td>13.1</td>
<td>9.1</td>
</tr>
</tbody>
</table>
Table 2

Multivariate Analyses of Variance Degrees of Freedom, F Ratios and p-values for Time and Group X Time

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>F ratio</th>
<th>Sig.</th>
<th>partial eta squared</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
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<td>5.1</td>
<td>.012</td>
<td>.25</td>
<td>36</td>
</tr>
<tr>
<td>Group X Time</td>
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<td>.268</td>
<td>.08</td>
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Table 3
Descriptive Statistics BDI-II and RCMAS-2 at Time 1 and Time 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI-II Time 1</td>
<td>Yoga Group</td>
<td>24</td>
<td>15.7</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>Control Group</td>
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<td>13.6</td>
<td>9.7</td>
</tr>
<tr>
<td>BDI-II Time 2</td>
<td>Yoga Group</td>
<td>24</td>
<td>10.1</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Control Group</td>
<td>18</td>
<td>8.7</td>
<td>7.3</td>
</tr>
<tr>
<td>RCMAS-2 Time 1</td>
<td>Yoga Group</td>
<td>21</td>
<td>10.6</td>
<td>6.6</td>
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<tr>
<td></td>
<td>Control Group</td>
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<td>8.9</td>
</tr>
<tr>
<td>RCMAS-2 Time 2</td>
<td>Yoga Group</td>
<td>21</td>
<td>7.6</td>
<td>5.8</td>
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<td></td>
<td>Control Group</td>
<td>16</td>
<td>8.4</td>
<td>9.6</td>
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Table 4

One-Way Repeated Measures Analysis of Variance for Depression and Anxiety

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
<th>partial eta squared</th>
<th>N</th>
</tr>
</thead>
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</tr>
<tr>
<td>BDI-II</td>
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<td>13.35</td>
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<td>.250</td>
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<tr>
<td>Group X Time</td>
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<td>2.19</td>
<td>.052</td>
<td>.820</td>
<td>.001</td>
<td>42</td>
</tr>
<tr>
<td>RCMAS-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
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<td>43.92</td>
<td>43.92</td>
<td>3.99</td>
<td>.053</td>
<td>.102</td>
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<td>40.46</td>
<td>3.68</td>
<td>.063</td>
<td>.095</td>
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Table 5

Means and Standard Deviations for RCMAS-2 Subscales

<table>
<thead>
<tr>
<th>Subtest</th>
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<th>Pretest</th>
<th>Posttest</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>( M )</td>
<td>( SD )</td>
</tr>
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<td>Yoga</td>
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<td>3.1</td>
</tr>
<tr>
<td></td>
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<td>4.0</td>
</tr>
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<td>Yoga</td>
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<td>2.1</td>
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<tr>
<td></td>
<td>Control</td>
<td>1.69</td>
<td>2.6</td>
</tr>
<tr>
<td>Physiological Anxiety</td>
<td>Yoga</td>
<td>4.38</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.94</td>
<td>3.0</td>
</tr>
</tbody>
</table>
APPENDIX E

Figures

Figure 1 Inventory of Callous-Unemotional Traits Scree Plot
Figure 2 Interaction of Group and Time for Worry Subscale
Figure 3 Anxiety Scores for Yoga and Control Groups by Low and High CU Traits
REFERENCES


