EFFECTS OF YOGA ON STRESS AMONG COLLEGE STUDENTS IN A POST-KATRINA POPULATION

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EFFECTS OF YOGA ON STRESS AMONG COLLEGE STUDENTS IN A
POST-KATRINA POPULATION

by

Jay Andrew Smith

A Dissertation
Submitted to the Graduate Studies Office
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

August 2007
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ABSTRACT

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Prior research has indicated that undergraduate students do not use college counseling services regularly when confronted with stress. Rather, the students are more likely to engage in physical activity that may have some ameliorative effects and research has shown that traditional exercise, such as walking, does have some effect on stress in this population. However, there are attractive and readily available alternatives to traditional exercise, such as Hatha yoga, that may offer increased benefits over exercise as Hatha yoga is a more comprehensive practice that includes meditative, ethical, and exercise components. This study compared distress states, spiritual growth, physical improvement, and quality of life for individuals participating in comprehensive Hatha yoga practice versus a Hatha yoga regimen having only an exercise component versus a traditional exercise—walking. Differences across time for stress and depression, and interactions for physical variables for both yoga groups are discussed. Possible explanations for results are discussed, with particular attention paid to aspects specific to a post-Katrina population.
ACKNOWLEDGMENTS

I owe my thanks to a number of people who made this project possible. I would like to thank my committee members, Dr. Randy Arnau, Dr. Mitch Berman, Dr. Brad Green, Dr. Tammy Greer, and Dr. Sheree Watson, for your help with both this project and my development over the course of my graduate study. I am grateful to each of you for the contributions you have each made along the way in forming the person and professional I am becoming. Dr. Greer, in particular, as my chair, advisor, and confidante, has guided my personal and professional growth, offering peace and support when I have needed it, not to mention the occasional motivating shove in the right direction. I don’t know that I can capture my gratitude for your encouragement, knowledge, and friendship, except by expressing, “Namaste.” Special thanks go to Dr. Sheree Watson, Audrey Coley, and James and Barbara for so generously offering financial support for this project, and thank you to Dr. Tim Scheett for freely offering your personal time and energy to analyze samples. Thank you, too, to Janine Bennett for all those reminder call to the participants. I must acknowledge the Divine within my research team: Tania Bayne, Brendan Clark, Chantelle Pseekos, and Ashley Wreay. This project would not have been successful without your hours of help and hard work, and your openness to the experience. I am truly humbled by your selflessness, and happy to know that you are my friends and colleagues. As always, thank you to Shannon Drew, for your constant support and affection, and your willingness to read countless drafts without a hint of boredom.
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CHAPTER I
INTRODUCTION

The evaluation of yoga as a comprehensive practice that may be beneficial for stress reduction is much needed. Furnham (2000) has reported that a significant portion of the general population has a favorable attitude toward integrating alternative medicines and treatments into their regimen, and that yoga received one of the highest approval ratings. Other research (Sparber et al., 2000) has indicated that medical populations also favor the use of complementary techniques, including spiritual practice, relaxation, exercise, and imagery, to improve outcomes. Wellness programs rely on this method of treating the “whole” person, including physical, mental, and spiritual development, and when spirituality is included in these systems, enrollment has been seen to increase by as much as 400% (Seaward, 1989).

Unfortunately most of the yoga research from the West seems to focus only on the exercise and relaxation benefits. This is likely the case because the conceptualization here in the West is that of yoga as an alternative to exercise. As it relates to the Selye stress model, the relaxation component of a yoga practice is important because it places the person in a state that is not compatible with the anxiety engendered by stressors (Brown, 1980), however, there are other components to Selye’s and later stress models, specifically the cognitive models, that can be addressed only in a more comprehensive form of yoga. For example, the meditation component of yoga may facilitate a more accepting and passive attitude about the inevitability of stress and the ethical component of yoga may offer guidance on the development of healthy psychosocial attitudes and behaviors that foster social support.
In its original Eastern form yoga is a spiritual practice, and this has important implications for research questions that can be explored, particularly concerning the ethical and moral directives that Selye suggests are key in offering stress relief (Selye, 1978). Walsh (1999) has suggested that, as Western scientists consider the inclusion of Eastern-inspired disciplines in treatment, they should utilize the practices as they were originally intended in order to elicit full benefit. Walsh recommends several criteria the Western scientist should ensure are included in the practice, including the ethical teachings at the core of the original practice. In exploring the benefits of a Hatha yoga practice, one would need to include an exercise component along with breath control, as well as a meditation component and also a spiritual and ethical component (Feuerstein, 1998).

Despite the call for utilizing Eastern techniques in their original form, and the public’s apparent willingness to include a spiritually-integrated complementary regimen in treatment, research in the West has not systematically explored yoga in an integrated form. As one study by Smith, Amutio, Andersen, and Aria (1996) demonstrates, there is wide variation in the focus of research on yoga practices. Yoga with stretching, yoga with breathing, yoga with stretching and breathing, yoga with meditation, and yoga with breathing and meditation are all endorsed differently by various members of their sample of individuals who regularly utilize the practice as a relaxation technique.

In considering yoga as a psychological intervention, and taking it beyond its original function as a spiritual guide to living, it would be prudent to examine the practice from a scientific theoretical position. In order to determine whether and why yoga might have mental health benefits, including stress reduction and its associated physiological
changes, it might be helpful to consider the practice against Selye’s theoretical backdrop. As stressful life events occur (e.g., the ongoing stress of being in college), persons are placed under stress, either eustress or distress. What yoga offers is surely relaxation, with its exercise and breathing components. In the Selye model, the meditation in yoga also offers a reframing or reappraisal process, in which the practitioner learns to respond passively to stressors. However, a traditional Eastern practice, one that incorporates spiritual lessons, should offer the ethical component that Selye describes as necessary to foster psychosocial growth, as well as prevention of negative stress-related outcomes and future bouts of distress.

In a review of the stress-related literature, Hobfoll, Schwarzer, and Chon (1998) note that, particularly as it relates to health outcomes, “stress” has been defined and studied in a variety of ways. This makes discussion of the topic difficult and often confusing, and the result is that the research is often conducted in an atheoretical manner. In an approach similar to that employed in pharmaceutical research, researchers frequently discover an intervention that reduces the effects of stress, then conduct studies to investigate why the interventions might be effective. This approach seems to have been taken in regards to yoga, a practice that is purported to offer stress relief, but has not been investigated to discover why it may function in that capacity.

Selye (1980) proposes a model of stress and its effects on an organism that seems relevant to studying how yoga might offer benefit for stress relief. He suggests that stress occurs as any demand is placed on the body. Both good (eustress) and bad (distress) stress cause physiological responses that may be measured objectively. According to Selye’s theory, an individual cannot avoid stress, because it will occur in response to any
demand. He suggests that managing stress must involve a shift in how the individual either interprets a stressor (appraisal) or how the individual chooses to respond (active versus passive) (Dohrenwend & Dohrenwend, 1981; Lazarus, 1980). Just as the physiological effects of stress on the body may be countered and even buffered by factors that promote physical health, exercise for example, the psychological toll may be mitigated by factors that affect psychological health. For example the development of ethical acts including goodwill, esteem, support, and love for others, and an acceptance that stressors will occur are essential in managing stress because these acts facilitate growth within a larger social context, thus offering continued support when stressful events occur, or recur, in the future (Selye, 1978).

Yoga represents an intervention for stress reduction that has many of the components relevant to Selye’s model. Further, yoga may offer benefits for stress relief that would be consistent with other possible explanations for successful stress management. Beck (1984) has proposed that an individual’s cognitive structure has an effect on how she or he will respond to stressors. When confronted with a stressful event, Beck proposes that the individual first considers how the situation will affect the self. He suggests that an individual then considers the situation, and responds cognitively, “How does this affect me?” The individual conceptualizes the situation in such a way as to answer that question, taking into account all available information, some of which might be distorted. The situation is, thus, appraised and evaluated. As it relates to stressful events, the individual may appraise the situation as a threat to self or self’s interests, and react accordingly, utilizing coping resources available, and weighing costs and benefits. As stated, this is an internal, cognitive appraisal process. In treating stress-related
psychological phenomena, then, cognitive evaluation and restructuring are essential in affecting the individual's mood state (Beck, Rush, Shaw, & Emery, 1979). Yoga, with its emphasis on physical well-being, and its equal emphasis on internal growth, seems a likely candidate for treatment of stress that fits neatly within the context of contemporary stress management techniques.

In the West, claims about the benefits of a regular yoga practice range from stress relief to weight loss, and include increased energy, improved skin tone, and relief from asthma (Hurst, 2004; McGinnis, 2004; Parker-Pope, 2002; Schaeffer, 2000; Schaeffer, 2002). Some authors suggest that a yoga practice may be helpful in dealing with unhealthy desires and attachments, such as overindulgence in eating and spending (Tindle, 2005). Others frequently recommend specific poses or yoga flows (a series of yoga poses) for specific purposes. For example, certain poses are reported to be better for digestive trouble or headaches (Landau, 2000). Whereas it seems likely that many people do experience some benefit from yoga practice, the empirical research on yoga to date has not addressed many of the claims made in the popular press (Saper, Eisenberg, Davis, Culpepper, & Phillips, 2004).

Focusing on stress among college students as an area in need of plausible and effective intervention, the current study examines whether this population will experience stress reduction and its associated physiological changes, as well as the changes one might associate with spiritual growth and development by receiving practice in a yoga group designed as an exercise regimen, versus a yoga group having exercise, meditation, breath-work, and ethical/spiritual teaching components, versus a traditional exercise group, versus a psychoeducation control group.
The Need for an Effective Intervention for Stressed College Students

Psychological services such as counseling are available on most college campuses and are known to be effective at alleviating mild and moderate distress (Draper, Jennings, Baron, Erdur, & Shankar, 2002; Watson, Gordon, Stermac, Kalogerakos, & Steckley, 2003). However, few students report utilizing these services, despite experiencing difficult and potentially dangerous, distress states (Rule & Gandy, 1994). In one study, only about 7% of college students believed they would seek professional counseling (Oliver, Reed, Katz, & Haugh, 1999). Alternatives to psychological services, including traditional exercise and yoga are also readily available on most college campuses and have demonstrated some effectiveness in alleviating emotional distress as well (Berger, Owen, & Man, 1993; Woolery, Myers, Sternlieb, & Zeltzer, 2004). Moreover, these alternative techniques seem very attractive to young, active, relatively healthy college students.

In fact, a 2003 National Intramural-Recreational Sports Association (NIRSA) survey involving 16 colleges and universities around the United States (Downs, 2003) revealed that approximately 75% of students utilize recreational sports programs such as group exercise classes and intramural team sports, as well as facilities such as gym and traditional workout areas. Moreover, participation in these programs ranks high for the student population in determining overall satisfaction and success in the academic setting. Students who utilize recreational sports programs and utilities more than 25 times per month report that the programs are more important in terms of overall satisfaction with the collegiate experience than other campus-associated activities such as sorority/fraternity affiliation, participation in, and viewing of varsity sports, participation
in clubs and organizations, and availability of community resources, such as area
restaurants and cultural venues. Across various school types, from small private colleges
to large public universities, students believe recreational sports are more important to
success and satisfaction than study abroad programs and participation in a part- or full-
time job. Students utilizing recreational sports programs also report feeling less stress,
more happiness, and an enhanced feeling of emotional well being. Generally, across all
students, participation in recreational sports programs is significantly correlated with an
overall sense of happiness with the college experience. When asked about the benefits
experienced from recreational sports participation, students report an improved sense of
emotional well being, reduced stress, and improved self-confidence. The NIRSA study
further revealed that the importance of recreational sports programs increases with
participation, with heavy users (using programs and facilities more than 25 times per
month) placing more emphasis on recreational sports programs than light users (using
programs and facilities up to 25 times per month) and non-users. Also, heavy users
experience more benefit than light users, who in turn experience more benefit than non-
users. These findings from the NIRSA study, which was designed to collect self-report
information on the relative value of recreational sports from students who might represent
the general student population, gives insight into potential of alternative therapies such as
yoga that, if effective, may benefit a population that is not inclined toward more
traditional forms of therapy.

The benefits of exercise might be confounded by other activities associated with
frequent exercise. For example, among college students, heavy users of recreational
sports programs also are less likely to smoke cigarettes and more likely to attend religious
services. However, this same group is more likely to consume more than three alcoholic beverages in a single day, more likely to use illegal substances, more likely to cheat on exams or other assignments, and more likely to miss school because of hangovers (Downs, 2003). A practice like Hatha yoga, with an exercise component along with a system of restraints and admonitions that encourage a healthier lifestyle, may provide psychological benefits that a program focusing on exercise alone cannot provide.

Currently, yoga, as an alternative exercise, is becoming increasingly popular on college campuses. One presentation at the 2004 NIRSA Conference titled “Creating a Yoga Program that ‘Rocks,’” was designed specifically to promote yoga for recreational sports administrators on college campuses. A search of the Big 10 schools’ recreational sports programs reveals that the majority offer yoga classes. Some of these classes have generated enough interest that entire programs are now devoted to “Mind-Body” development. If the larger universities are considered indicative of trends, yoga would appear to be growing into a widely available class on college campuses.

As an alternative and complementary therapy that may have benefits for physical and psychological well-being, Hatha yoga, from the Raja branch of yoga and the form most prevalent in the U.S. (Feuerstein, 1998), is a good candidate. One aspect of Hatha yoga, compared to other branches of yoga, concerns development of the body and physical fitness is one benefit of the practice, making it attractive for those looking for an alternative form of exercise. In a collegiate population, this is an important aspect of the practice, because this population is more likely to utilize exercise or physical activity than seek counseling or therapy.
Overview of Yoga

The word “yoga” is derived from the Sanskrit work “yug” meaning “to yoke” and is understood as the union of the individual self with the Supreme self. As practitioners move beyond the personal realm, they may discover themselves becoming part of something larger than self, with a repertoire of behaviors free from previously learned patterns of maladaptive behavior (Feuerstein, 1998). There are traditionally four major branches of yoga with separate foci: Raja, with a focus on self control; Bhakti, with a focus on emotional devotion; Karma, with a concern for actions and their effects on one’s environment; and Jnana, with a focus on scholarship. Additionally, there are many schools within each of these branches, so that there is a plethora of variation in the particular form a yoga practice takes. Even so, there is a common goal among the variations in style. With all yoga practices, the goal of the practice is movement beyond ordinary consciousness, along with the limitations of personal self, to a liberated state of living in which the practitioner may leave behind old, unhealthy physical, mental, and ethical habits.

In the United States, there are over 11 million practitioners of the various forms of yoga (Herrick & Ainsworth, 2000), with Hatha yoga being the most popular form. Hatha yoga emphasizes the development of the body in anticipation of a spiritual union with the Divine, brought about by meditation and stillness, and accompanied by a broadening awareness of one’s body in relation to the external environment (Tigunait, 2001). Hatha has a physical component which consists of holding postures (asanas) that serve to stretch and strengthen the musculature, and breathwork (pranayama), meditation (pratyahara), and ethical teachings (yamas and niyamas) are also part of the practice.
Kabat-Zinn (1990) has utilized a gentle, “mindful” Hatha yoga practice that involves strength and flexibility training, along with an emphasis on attention to the body’s sensations and responses to the practice. He posits that practicing at one’s individual physical limits, without over-taxing the body, creates an atmosphere in which a person experiences heightened awareness of physical strengths and abilities, in much the same manner as a body scan technique. By changing the body’s position and orientation, he suggests that the person’s internal or mental perspective must also change in response to the change in external environment.

The Exercise Component of Yoga

Evaluating the exercise component of yoga is somewhat problematic. As many as 25 years ago, it was suggested that yoga could not be compared to exercise in the scientific literature because exercise indicates movement, while the muscular involvement in yoga, termed ‘asanas’, is more steady and controlled (Thayer, 2001). It was suggested that tests of flexibility might be a better indicator of the bodily involvement in yoga, with the Wells Sit and Stretch Test being used to demonstrate yoga’s positive effect in the area of flexibility (Funderburk, 1977). However, to more precisely evaluate the value of yoga as exercise, it is necessary to examine the mechanisms of exercise. Duration and intensity are key to understanding why yoga’s exercise component may be highly effective in treating distress states. During exercise, glucose breakdown releases adenosine tri-phosphate (ATP), resulting in available energy for various systems, including muscles and the cardiovascular system (Thayer, 2001). As heart rate and blood pressure increase during acute activity, respiration increases, and the hormones cortisol and adrenaline are released. This series of events is responsible for the
decreased tension experienced during exercise. In addition, both of these hormones are essential for concentration. In moderate exercise, as opposed to vigorous exercise, tension reduction is longer-lasting, so effects may be felt long after the exercise session. Thayer (2001) terms the resulting energetic sensation “calm energy.” He explains that this is energy without tension, and allows the practitioner to remain calm, even if she or he becomes involved in other activities. In a moderate exercise practice such as yoga, decreased muscle tension and improved respiration help the practitioner relax. Mood is affected as the sympathetic nervous system causes norepinephrine release (boosting energy), and the parasympathetic nervous system causes acetylcholine release (conserving the now-available energy). Sympathetic activation also results in cortisol release. A moderate exercise regimen seems to be most effective when it is practiced for about one hour, three to five times per week, at moderate intensity, or 50% of maximum heart rate (Shephard, 1997). Hackney and Viru (1999) report that both moderate and high-intensity exercisers experience favorable cortisol release, with night-time levels decreasing following periods of regular exercise. The exercise effects of yoga, in particular, on cortisol might also be enhanced by the practice’s relaxing quality. Research has shown that cortisol levels respond favorably to relaxation techniques (Cruess, Antoni, Kumar, & Schneiderman, 2000; Cruess, Antoni, McGregor, Kilbourn, Boyers, Alferi, et al., 2000; Van Eck, Berkhof, Nicolson, & Sukon, 1996).

Regular exercise, of moderate intensity and temporal regularity, is positively correlated with diminished distress. Participants who improve their overall fitness utilizing various forms of exercise, both aerobic and anaerobic, are less likely to be distressed by potentially stressful events and have fewer incidents of self-reported illness.
and subsequent visits to a local health center. Physical fitness has been shown to have a “cushioning” effect on life stress (Ensel & Lin, 2004). Regular exercisers report less tension, depression, anger, fatigue, and confusion than those who do not exercise regularly (Berger et al., 1993).

Physical activity has also been shown to be effective in coping with current distress, with a review indicating that 90% of studies show a relationship between physical activity and diminished depressive and anxiety symptoms (Byrne & Byrne, 1993). In studies with depressed populations, exercise has been shown to be an effective complementary treatment, often as effective as other interventions, including psychotherapy (Moore & Blumenthal, 1998). Some authors suggest that moderate exercise can be more effective than high intensity exercise in alleviating depressive symptoms (Gauvin, Rejeski, & Norris, 1996), and is also effective in relieving anxiety symptoms (O’Connor, Bryant, Veltri, & Gebhardt, 1993). This finding might have implications for the effectiveness of yoga because the most common forms of yoga do not constitute a high intensity workout. Also pertinent to the study of yoga as exercise, the authors indicate that flexibility and strength training are equally effective at alleviating depressive symptoms. However, the authors note that the literature does not substantiate the conclusion that exercise will prevent the onset of depression or anxiety symptoms. Rather, findings indicate that exercise is effective at diminishing symptoms once they are present.

While there is ample evidence of exercise’s positive benefits, there are several consistent methodological difficulties with the literature on exercise. Authors frequently fail to operationally define exercise and indicate the specific physical activities involved,
making replication and follow-up studies difficult. Often, the studies are quasi-experimental, with subjects drawn from a convenient group, and lack screening for pre-existing psychological symptomatology (Byrne & Byrne, 1993). Some of these liabilities may explain why findings from one meta-analysis of the exercise literature indicate that exercise fared no better than medication or cognitive therapy in treating depression and that the studies in general are too poorly executed to be deemed successful, with only one published study using a post-treatment follow-up (Byrne & Byrne, 1993). Other studies used in the analysis reported results immediately following the intervention, and evidence of the long-term benefits of exercise (long-term meaning more than a few months) are lacking, although there are studies currently being conducted which will have follow-up data up to two years post-intervention (Lawlor & Hopker, 2001).

The Meditation Component of Yoga

Meditation is another component in yogic philosophy which may have benefits for distress states. The goal of the meditation component, or dhyana, is a heightened state of awareness of the here and now. In this state, the yoga practitioner is readied to achieve a sense of oneness with the Infinite (Sturgess, 2002). Meditation requires breathing technique, proper posture, and focused attention. With these components in place, psychologically, the individual is able to enter a state of “balance,” emotionally and mentally (Austin, 2001).

During meditation, as an individual focuses attention, either on an object or a mantra, cortical activity increases in response to a filtering effect created by the thalamus and the limbic system. As attention increases, so does the filtering. The brain, deprived of sensory input, becomes more malleable, rather, more receptive to suggestion such as
what might be provided in a mantra, or an object of concentration (Boos, 2001).

Decreased oxygen consumption, decreased sympathetic nervous system activity, and decreased muscle tension result (Benson, Beary, & Carol, 1974; Jevning, Wallace, & Beidebach, 1992; Wallace, 1970), which inhibits symptoms typically associated with anxiety and distress (Goldberg, 1982).

Meditation has also been found to moderate cortisol response, better enabling the body to manage stressful situations as they arise, which may reduce damage to muscle tissue, prevent hypertension, facilitate growth hormone release, and improve immune functioning (Carlson, 2001). Transcendental meditation subjects have experienced changes in growth hormone, testosterone, and thyroid-stimulating hormone, as well as cortisol, suggesting that the body's hormonal response to stress is bolstered through the use of a meditation intervention (MacLean, Walton, Wenneberg, Levitsky, Mandarino, Waziri, et al., 1997).

While researchers have not found cortisol differences between long-term meditators (average length of practice was 7 ½ years) and the general population, they have found that meditators had a negative feedback mechanism for cortisol, due to other hormonal irregularities in diurnal rhythm patterns (Infante et al., 1998). In examining daily rhythms, meditators have been found to experience lower levels of norepinephrine and epinephrine levels in the morning, indicating an effect of meditation on the sympathetic-adrenal medulla system. In the stressed individual, lowered levels of these hormones might serve as buffers against heart disease by preventing elevated blood pressure (Carlson, 2001).
Studies on mediation have shown that meditation promotes diminished stress and worry (Gillani & Smith, 2001; Janowiak & Hackman, 1994; Williams, Kolar, Reger, & Pearson, 2001), decreased anxiety (Gaylord, Orme-Johnson, & Travis, 1989; Kabat-Zinn et al., 1992; Miller, Fletcher, & Kabat-Zinn, 1995; Pearl & Carlozzi, 1994; Roth & Creaser, 1997), and decreased depressive symptomatology (Fabbro, Muzur, Bellen, Calacione, & Bava, 1999; Shapiro, Schwartz, & Bonner, 1998; Teasdale, Segal, & Williams, 1995). These findings are from diverse populations, including students from medical schools, individuals in inner city neighborhoods, and students on college campuses.

Meditation can produce practical benefits for daily life. For example, school teachers who meditated reported less stress and fewer emotional problems, while those trained in traditional stress management techniques reported increased stress (Winzelberg & Luskin, 1999). Other teachers trained in meditative techniques report less feeling of “burnout” and decreases in state and trait anxiety (Anderson, Levinson, Barker, & Kiewra, 1999).

One form of meditation that has recently begun to be researched is that of mindfulness-based stress reduction (MBSR). This technique is a Western adaptation of a form of Eastern meditation in which stress is reduced and emotions changed through the use of mindfulness. Mindfulness may be described as a highly aware state, during which the practitioner is able to look at events and thoughts in a detached manner, enabling him or her to create appropriate responses to anticipated stressors before stressful events take place (Bishop, 2002). Although Buddhist in its origins, mindful meditation practice has been conceptualized as a non-spiritual or religious technique. Kabat-Zinn (1994, 2005)
describes the mindful outlook as one of nonjudgment, purpose, and attentiveness to the present moment. With these tenets in place, the practitioner is able to become aware of him or herself in a larger context, and experiences a movement toward openness to experience and a return to the self in its most natural state, free from the encumbrances of external and internal pressures.

The mindfulness technique has been used in medical populations with much success. Patients utilizing an MBSR intervention had fewer physical complaints, and stress-related symptomatology decreased over an 8-week period (Reibel, Greeson, Brainard, & Rosenzweig, 2001). Cancer patients have also experienced improved mood and decreased stress using MBSR (Speca, Carlson, Goodey, & Angen, 2000), and chronic pain sufferers report pain stabilization and continued treatment compliance more than one year post-intervention (Kabat-Zinn, Lipworth, & Burney, 1985). In a study involving irritable bowel syndrome patients, meditators experienced fewer gastrointestinal symptoms, as well as decreases in the incidence of backache, headache, and other physical symptoms. In addition, 31% of meditators reported less worry, while the same percentage reported less depression, and 39% reported less anxiety on a side effects questionnaire (Keefer and Blanchard, 2001). These findings, as well as those mentioned earlier, indicate potential for meditation, as a component of a yoga practice, to provide benefit for psychological distress.

In the context of a yoga practice, meditation effects may be expected due to the principles of Benson's relaxation response (Benson, 1975), which proposes that an individual will undergo certain physiological changes in response to a practice that involves quieting the mind, a passive attitude, certain body positions, an appropriate
environment, and mental focus. Smith (1986) has re-stated the idea in cognitive-behavioral terms, stating that relaxation occurs when an individual is passive, receptive, and focused. Goldberg (1982) has suggested that mental focus on an object, a word, or a phrase, paired with a passive attitude and a quiet environment, and a comfortable body position will elicit the relaxation response. Taken in a general way, the casual observer of a yoga class may see where these principles are in effect, creating a scenario that is ripe for relaxation and change to occur.

While the meditation literature is extensive, only a limited number of studies used random assignment and selection, and most have had relatively small sample sizes, limiting generalizability. Relatively few studies have explored the benefits of meditation as practiced in yoga.

The Ethical and Spiritual Components of Yoga

A yoga practitioner uses meditation to focus attention inward, and the asanas (exercises) provide physical support for a spiritual experience to occur. The yogin, or yoga practitioner, is then able to attend to inner functioning, but is also able to attend beyond the self, to the Infinite (Bouanchaud, 1997). Coming into contact with something larger than the self (Decker, 1993), the yogin is driven toward “completeness” (Baldacchino & Draper, 2001). While this may seem enigmatic and therefore difficult to operationalize, one may consider the more concrete benefits that spirituality facilitates. A sense of oneness with everyone allows for contact with others that may result in social support, and offers health promotion through the encouragement or prohibition of certain behaviors (e.g. drugs and alcohol). The individual may also find suffering endurable as a spiritual foundation provides purpose in life (George, Larson, Koenig, & McCullough, 2001).
2000), or may feel some consolation in spiritual lessons (Fitchett, Rybarczyk, DeMarco, & Nicholas, 1999). Some cancer patients report that spirituality and religion provide emotional support, strength to address issues related to their illness, and guidance. In addition, these patients report that the social support and moral direction offered by a spiritual discipline are also important to managing distress (Feher & Maly, 1999).

In treatment settings, spirituality has proven to be effective for various symptoms, both physical and emotional. Religious coping has been shown to reduce blood pressure (Steffen, Hinderliter, Blumenthal, & Sherwood, 2001). Spiritual direction in cancer patients has been effective in health promotion, resulting in better health outcomes (Sparber et al., 2000). Spiritual direction has resulted in an enhanced sense of personal control, and boosts self-esteem (Steffen et al., 2001). Spiritual direction also affects negative affect, and provides a buffer against stress (Kim & Seidlitz, 2002). When spirituality has been integrated with traditional therapy modes, such as cognitive-behavioral therapy, results indicate that outcomes are more favorable than those from a non-integrative approach (Cole & Pargament, 1999; Propst & Ostrom, 1992).

Integral to a religious or spiritual practice is the concept of hopefulness. Hope has been defined in terms of action, motivation toward movement into the future, and expectations of achieving a personal goal, with an emphasis on realizing and working within one’s personal strengths and weaknesses (Snyder, 2000; Stotland, 1969). Snyder (2000) suggests that hope acts as a moderator and mediator in treatment, but he also acknowledges that hope may have a causal role when assessed in interventions. In his model of hope, Snyder describes how an individual’s learning history helps to determine whether goals are attainable and/or important. The individual then pursues goals
according to perceived capacity for attaining them, as well as the strength of the belief that the goals can be attained. Due to its goal-directed nature, hope is said to be an important piece of cognitive-behavioral approaches to therapy (Snyder et al., 2000). Herth (1992) and colleagues (Mickley, Soeken, & Belcher, 1992) have reported that certain aspects associated with hope (i.e., positive readiness, interconnectedness, and temporality) are also correlated with a sense of spiritual well-being, and research has indicated that hope has effects for a variety of outcomes. Hopeful adults with schizophrenia experience less suicidality and fewer psychotic symptoms (Littrell & Herth, 1996). Minkoff, Bergman, Beck, and Beck (1973) reported that a poverty of hope, or hopelessness, is strongly correlated with depression and suicidality, and an increased sense of hope has been associated with improved immune functioning and coping skill (Herth, 1989) and improved academic outcomes (Snyder et al., 2002). Inclusion of an ethical and spiritual component in a yoga practice may have an impact on this variable and, therefore, may offer benefit beyond that of exercise alone.

The Current Study

Smith and Greer (2005) found that depressed, anxious, and stressed college students benefited from both an integrated yoga practice that included a spiritual and ethical framework, and a yoga practice designed primarily as an exercise regimen. Changes over time in distress symptoms, cortisol, and hopefulness suggest that yoga was beneficial. The prior study was limited by its lack of a moderate exercise regimen comparison group, such as a walking group. Lack of random assignment and a small sample size for the yoga as exercise group, however, also limit the extent to which the outcomes for the interventions may be compared, and broad inclusion criteria make
clinical significance difficult to determine. The current study attempted to determine whether inclusion of a spiritual component had an additive effect in the treatment of stressed individuals, and whether either yoga intervention elicited benefits beyond that of a moderate exercise regimen – walking. The following hypotheses were offered for the study:

The primary hypothesis was that all exercise groups (integrated yoga, yoga as exercise, and walking groups) would report reduced stress. Walking and Yoga as Exercise were hypothesized to offer the same benefit, as they both represent moderate forms of exercise. The integrated yoga group, with its combination of spiritual component that has been shown to affect stress, was hypothesized to provide the greatest benefit of all the groups. Symbolically, the hypothesis for resultant stress scores may be represented by the following: Psychoeducation-Control > Walking = Yoga as Exercise > Integrated Yoga

A secondary hypothesis was that measures of spirituality (purpose in life, spiritual meaning, and hopefulness) would be most affected by participation in the integrated yoga group. Further, it was hypothesized that participants in both the walking and psychoeducation-control groups would report no significant change on these variables. In symbol form, the hypothesized pattern of scores for spiritual measures: Psychoeducation-Control = Walking = Yoga as Exercise < Integrated Yoga

Because somatic complaints have been shown to be affected by meditation, it was hypothesized that participants would report fewer complaints, but that integrated yoga would offer the most benefit of all the groups because of its additional spiritual component. It was hypothesized that the walking group would also experience some
benefit, but not as much as either yoga group, and would have more complaints than the
control group, which would have the most reported somatic complaints:

Psychoeducation-Control > Walking > Yoga as Exercise > Integrated Yoga

Because cortisol has been shown to be affected by moderate exercise, it was
hypothesized that all exercise groups would report decreased salivary cortisol. Meditation
has also been shown to affect cortisol, and it was expected that both yoga groups would
report lower cortisol levels than the walking group. The integrated yoga group, with its
additional spiritual practice, was hypothesized to have the lowest cortisol levels at study’s
end: Psychoeducation-Control > Walking > Yoga as Exercise > Integrated Yoga

It was hypothesized that participants in both yoga groups would be more flexible
than participants in either the walking or psychoeducation-control groups:

Psychoeducation-Control = Walking < Yoga as Exercise = Integrated Yoga

It was hypothesized that participants in all exercise groups would have lower
resting heart rates than participants in the psychoeducation-control group at the end of the
study. It was further hypothesized that participants in the yoga groups, with the additional
meditation component and emphasis on diaphragmatic breathing, would have lower
resting heart rates than participants in the walking group: Psychoeducation-Control >
Walking > Yoga as Exercise = Integrated Yoga
CHAPTER II

METHOD

Participants

All students were treated in accordance with the “Ethical Principles of Psychologists and Code of Conduct” (American Psychological Association, 1992). The Human Subjects Protection Review Committee of the University of Southern Mississippi approved all procedures prior to the study being conducted (Appendix A). All participants completed a consent form informing them of potential risks and benefits of participation (Appendix B). Six-hundred eighty-four undergraduates enrolled in psychology courses at The University of Southern Mississippi were screened for inclusion in the study. Students under 18 years of age were not allowed to participate. Students were given course credit for participating in the screening, if allowed by the instructor. After signing a consent form for the screening (Appendix C), students were prescreened by the experimenter using the Stress Scale of the DASS. Participants were also provided with a scheduling worksheet at the time of screening to assist the researcher in determining optimal group meeting times (Appendix D) and were assessed for any physical limitations which would put them at risk in this study. Students with raw Stress Scale scores at or above 10, Depression scores below 36, and Anxiety scores below 30, were considered for inclusion.

DASS inclusion scores were based on several factors. When approximately 400 screenings had been scored, respondents’ scores were plotted, and an examination of the histogram for Stress indicated a lower mean than expected, suggesting that the cutoff score of 15 for Mild Stress be lowered accordingly. Also, for similar reasons, Depression
and Anxiety cutoff scores were raised to 28 and 20, respectively. This eliminated individuals who might have presented with Major Depressive Disorder or Anxiety Disorders.

Five-hundred nine students met selection criteria, and were asked to participate. Participants were told they had the opportunity to volunteer for a study on the effects of various interventions for psychological distress. At the time of invitation, participants were also screened for exclusion based on any physical impediment that would prevent participation in a moderate exercise program, use of a pacemaker, and, if female, current pregnancy or planned pregnancy within the next two months. Students who were interested in participating in the intervention were randomly assigned to an intervention or psychoeducation-control group, and were informed of the time and place of their group session. Students were also informed of the benefits of participation, which included: class credit for participation, if allowed by the instructor, through a Web-based experiment program; one random drawing in each class session for a gift certificate at a local eatery; and, participants with perfect attendance would be eligible for a random drawing for dinner for two at a local upscale restaurant, with one winner from each class.

Participants were randomly assigned to groups as much as possible. Because only two rooms were available for use in the study, classes were necessarily conducted in two consecutive one-hour blocks (i.e., Integrated Yoga Group and Yoga as Exercise Group during one hour, and Walking and Psychoeducation in the following hour). Nearly all participants were able to be randomly assigned to one of the two meeting times, though a very few (the exact number was not tracked per se, but was likely five or fewer participants) were not, and were placed in the time that best fit their respective schedules.
One-hundred thirty-four individuals agreed to enroll in the study, 18 withdrew from the study before the first class session, and 115 completed the study. One participant attended classes, but did not complete questionnaires. Completion of the study required completion of pre-intervention (Time 1) and post-intervention (Time 2) assessments for all participants, in addition to completion of half, or 6 of the 12 class sessions for the assigned group. Thirty-two individuals participated in the integrated yoga group, 25 in the yoga as exercise group, 30 in the walking group, and 28 individuals participated in the psychoeducation control group.

Psychological Measures

Depression Anxiety Stress Scales

The Stress Scale of the Depression Anxiety Stress Scales (DASS; Appendix E; Lovibond & Lovibond, 2002) was used to screen potential participants for current levels of stress. The DASS was developed using non-clinical samples of college undergraduates, and it is suitable for use with both individuals and groups. The DASS short form contains 21 items, each of which loads onto one of three scales. Subjects rate items related to depressive, anxious, or stressed symptomatology from 0 to 3, and scoring is completed on each of the 3 scales. Scale scores are often converted to z-scores, but raw scores may also be used to classify the symptoms endorsed as Normal, Mild, Moderate, Severe, or Extremely Severe. The DASS Depression scale has been shown to correlate well with the Beck Depression Inventory (r = .74), and the Anxiety scale correlates well with the Beck Anxiety Inventory (r = .81). Alpha values on a normative sample for Depression, Anxiety, and Stress scales were 0.81, 0.73, and 0.81, respectively. Reliability has been found to be acceptable for all subscales, with Cronbach’s alpha of .90 for Stress,
.84 for Anxiety, and .91 for Depression scales (Lovibond & Lovibond, 1995). Overlap between the Stress and Anxiety scales suggests that the Stress scale measures general distress, including a sense of over-arousal and difficulty confronting the demands of daily life. Although there are no scales which are directly comparable with the DASS Stress scale, it is sensitive to negative affectivity.

*Purpose in Life Test*

The Purpose in Life Test (PIL; Appendix F; Crumbaugh & Maholick, 1964) was designed to measure a sense of fulfillment in life. High scorers on the PIL have found a sense of meaning in their daily lives. These individuals also possess a more intrinsic orientation toward religion. Part A of the PIL consists of 20 items, and respondents are asked to rank each item on a 1 to 7 Likert-type scale, using dichotomous end-points (e.g., "completely bored" versus "exuberant, enthusiastic") to complete sentence stems. Though the PIL contains three sections, Part A is typically the only portion used in empirical research, and is the only section being used in the current study. Total scores at or below 91 suggest a lack of meaning in life, and scores at or above 113 suggest a definite sense of purpose in life. The PIL was normed using a wide variety of populations, including: undergraduates, affluent men and women, outpatients in a Southern state, and in-patient clients being treated for alcohol dependence. The PIL has been shown to have split-half reliability from .81 to .92, and test-retest correlations range from .68 to .83. The measure is correlated with both therapists' (r = .38) and clergy members' (r = .47) ratings of individuals' sense of purpose in life.
**Patient Health Questionnaire 15**

The Patient Health Questionnaire 15 (PHQ-15; Appendix G; Kroenke, Spitzer, & Williams, 2002) is designed to measure somatic symptomatology and severity. Respondents are presented with 15 symptoms, and asked to rate the frequency with which they have experienced each symptom over the last four weeks: “not at all,” “several days,” or “more than half the days.” The total symptom score may be classified as “minimal,” “low,” “medium,” or “high.” In an obstetric gynecological sample, alpha coefficients of .80 were reported. Individual items have been shown to have correlations between .20-.29 or .10-.19, with the highest correlation between items accounting for sleep problems and fatigue. Higher scores correlate with declines in overall functioning, as well as depressive symptoms as measured by the PHQ-9. High scores on the PHQ-15 have been found to significantly correlate with all scales of the Medical Outcomes Study Short-Form General Health Survey, which indicates declining functioning.

**Herth Hope Scale**

The Herth Hope Scale (HHS; Appendix H; Herth, 1991) is designed to quantify the amount of hopefulness that an individual may generally apply to him or herself, with hope theoretically related to spiritual connection and perceived social support. Respondents are presented with 30 items, and asked to rate the degree to which the items apply to them: “strongly disagree,” “disagree,” “agree,” or “strongly agree.” The HHS has been found to have good construct validity and reliability (Arnau, 2001), and has been correlated with lower depression scores on the DASS (Mascaro & Rosen, 2006) and Beck Hopelessness Scale (Herth, 1991). The measure has been shown to have test-retest reliability of .89 to .91 over a three-week period, and, among adults, has been found to
have alpha reliability coefficients ranging from .75 to .94. HHS scores have been found to negatively correlate with Neuroticism ($r = -.56$), and to have positive correlations with Conscientiousness ($r = .44$), Extraversion ($r = .43$), Agreeableness ($r = .30$) (Mascaro, Rosen, & Morey, 2004) personality factors of the Big Five. Among physically healthy adults, the overall mean for the pilot sample was 80, with a range of scores from 60 to 90. Test-retest reliability for this sample was high ($r = .90$) over a three-week period. A brief version of the HHS is also available, and correlates highly with the parent scale ($r = .92$).

*Daily Hassles and Uplifts Scales*

The Daily Hassles Scale and Uplifts Scale (DHU; Appendix I; Lazarus & Folkman, 1989) was designed to investigate the process of stress, by identifying sources of stress and coping, as well as potential mediators that may positively affect stress. The measure identifies how an individual appraises events, determining whether they are seen as stressful (a “hassle”) or in a more positive light (an “uplift”). Respondents are presented with the 117 items of the Daily Hassles Scale, and the 135 items of the Daily Uplifts Scale, and are asked to first circle the events which applied to them in a specific time frame (for the purposes of this study, the time was the previous four weeks), and then to rate the severity or amount of uplift experienced on a 0-3 Likert-type scale. Items are face valid, and Hassles scores have been found to be related to affective distress and somatic complaints. Hassles frequency has been found to be relatively stable over time, but ratings for hassles severity has been found to change over time. Study authors suggest that more research is necessary to determine the correlation of uplifts and health, well-being, and level of social functioning. Hassles scores have been shown to be stable over time ($r = .79$), suggesting that the scale may indicate respondents’ most typical hassles.
Hassles scores have also been correlated with life events over a 30-month period (r = .21), and with symptoms of psychological problems. For the current study, total scores were derived from each measure, with the intention of first determining whether further analysis of response frequency would be appropriate.

**Spiritual Meaning Scale**

The Spiritual Meaning Scale (SMS; Appendix J; Mascaro, Rosen, & Morey, 2004) is used to assess “the extent to which an individual believes that life or some force of which life is a function has a purpose, will, or way in which individuals participate.” According to its authors, the SMS assesses the extent to which a person feels that she or he is part of something larger than self, or something that is transcendent, and that meaning buoys hopefulness in the face of difficult situations. The SMS was normed with an undergraduate population with a predominantly Christian spiritual orientation, and has been found to have a coefficient alpha of 0.89. The SMS is correlated with the HHS (r = .62, p<.001), and negatively correlated with the Depression (r = -.42, p<.001) and Anxiety (r = -.19, p<.001) scales of the PAI. In a hierarchical regression analysis, the SMS significantly predicted variance for the HHS (.14, B = .43, p<.0001). Negative relationships with the Snyder Hope Scale, another measure of hopefulness, as well as control of social desirability on item construction, suggest that the SMS is measuring a unique concept that may predict hopefulness. Respondents are asked to rate the 14 items on a 5-point Likert scale: “totally disagree,” “partially disagree,” “I’m in between,” “I partially agree,” “I totally agree.” Total score is calculated as a sum of the responses.
Pre-Intervention Question

Participants were asked a pre-intervention question during the first session. Answers determined their expectations of benefit from participation in the assigned groups. (Appendix K).

Demographic Questionnaire

Demographic information obtained included: gender, ethnicity, age, religious affiliation, health behaviors, and use of nontraditional approaches to healing. Participants were also asked to describe the current stressors they were experiencing, and what they perceived to be part of their problem in effectively managing stress (Appendix L).

Post-Intervention Questions

At the conclusion of the study, participants were asked to rate the instructors and group content, and were provided an opportunity to share their personal experiences of participation in the groups (Appendix M).

Katrina Questionnaire

At the conclusion of the study, participants were administered a brief questionnaire that provided information on changes to lifestyle, beliefs, and behaviors since Hurricane Katrina. Items also provided information on damage to primary residence and time displaced by the storm. A final item asked the participants whether they would be willing to volunteer for a fictional hurricane relief team (Appendix N).

Physical Measures

Salivary Cortisol

Salivary cortisol has been shown to be a reliable indicator of the physiological effects of stressors. Participants provided a saliva sample, collected in plastic vials.
Because salivary cortisol has been shown to increase upon waking (Linkowski et al., 1993), and is sensitive to other mild stressors, participants collected saliva at home, following a method used by Roberts, Wessely, Chalder, Papadopoulos, and Cleare (2004). Participants were provided with detailed instructions, and collected saliva for four minutes, the mornings of the pre- and post-test measurements (Appendix O). They then sealed the container, and refrigerated it until the scheduled appointment for measurement. Samples were centrifuged for five minutes, and were measured using enzyme-linked immunosorbent assay according to manufacturer’s instructions (Salimetrix, Happy Valley).

Flexibility

Participants performed a trunk flexibility test and a shoulder flexibility test (Johnson & Nelson, 1986). These tests are generally accepted as good indicators of a person’s flexibility and physical fitness. During the trunk flexibility test, the participant lay prone on the floor. With his hands in the small of his back, the participant was asked to raise his head as high as possible in a slow, controlled manner. This was repeated 3 times, and the highest score was recorded for analysis. To test shoulder flexibility, the participant again lay prone on the floor, while holding a wooden dowel in his hands, extending from the shoulders. The participant was asked to raise his hands as high as possible in a slow, controlled manner, keeping his upper body on the floor. This was repeated 3 times, and the highest score was recorded for analysis.

Resting Heart Rate

Participants in each group were assessed for resting heart rate (RHR). Lowered RHR is considered to be an indicator of overall good physical health. RHR was measured
with a Polar Heart Rate Monitor, according to manufacturer's instructions. Measurements were taken when participants completed questionnaires, at pre and post-intervention, following their first ten minutes of sitting quietly to complete questionnaires.

Procedure

Intervention

Prior to their first class meeting, participants were individually administered the Pre-Intervention Question, demographic questionnaire, PIL, PHQ-15, HHS, Daily Hassles and Uplifts, and SMS. They were also assessed for flexibility and resting heart rate. Saliva tubes were distributed with instructions, and participants returned their samples at the first group meeting. Subjects were instructed, and agreed, to maintain their current eating habits for the duration of the study.

Participants met individually once at the end of the study to repeat the DASS, PIL, PHQ-15, HHS, Daily Hassles and Uplifts, and SMS, and were again assessed for flexibility and resting heart rate. They also completed the post-intervention questions and Katrina Questionnaire. Saliva tubes were distributed during the last group session and were collected when participants returned to complete questionnaires and perform physical measures. All saliva samples were stored at -80°C until assay.

Members of the research team met weekly during the five months prior to the beginning of the study. In their training sessions, they were each provided with hands-on instruction in the various interventions, with special attention paid to the yoga as exercise and integrated yoga groups. Classes were rehearsed so that each instructor provided verbatim verbal instruction, with focus on tone and quality of speech in addition to content. Instructors were also provided with suggestions for impromptu utterances in
each of the interventions. Instructors were aware of the content of the group lessons, and, though they were randomly assigned to the groups, they were not blind to the interventions they were assigned to instruct.

**Intervention Groups**

*Integrated Yoga Group.* The integrated yoga group engaged in a Hatha style yoga practice that incorporated gentle movements and a mindful perspective. Class material for both yoga interventions was drawn from various sources relevant to the study, including works by Baptiste (2002), Carroll and Kimata (2000), Chatlani (2003), and Kirk and Boon (2004). Each class began with a 10-minute warm-up, stretching and breathing to prepare for exercise. This was accompanied by a 10-minute meditation for the day, based on one of the yamas or niyamas of yogic philosophy. Participants were instructed to reflect on this statement as they executed the day’s poses, and were reminded of the phrase, as well as appropriate associated reflections that pertained to the pose being taught. Participants were guided through a traditional sun salutation for 10 minutes, then were taught poses that were specific to the yama or niyama for 10 minutes. As they executed poses, the participants received hands-on instruction to ensure they were performing the poses correctly and safely. Following the postures, participants were instructed to lie in corpse pose, and were guided through a relaxation exercise for approximately 10 minutes. Each yoga session lasted approximately 50 minutes. There were two sessions per week, for six weeks, with 20-minute homework assignments once per week. Classes were taught by teams of two researchers: one to model and provide verbal instruction, and one to walk through the classroom and make physical adjustments. Scripts for each class may be found in Appendices P through V.
Yoga as Exercise Group. The yoga as exercise group followed the same postural outline as the yoga group, but the focus was on stretching and strengthening, with no spiritual or ethical content. Instruction was provided to ensure all poses were being performed correctly and safely. Following the postures, participants were instructed to lie in corpse pose, and were guided through a relaxation exercise for approximately 10 minutes. Each yoga session lasted approximately 50 minutes. There were two sessions per week, for six weeks, with 20-minute homework assignments once per week. Classes were taught by teams of two researchers: one to model and provide verbal instruction, and one to walk through the classroom and make physical adjustments. Scripts for each class may be found in Appendices W through CC.

Walking Group. Participants were provided with instruction, and guided through the process of designing a personalized walking program, consistent with guidelines provided by the American Heart Association (American Heart Association, 1995). Participants received instruction in stretching and pacing, using rate of perceived exertion (RPE) and “talk-test” as individual guides, with speed and duration incrementally increased on a weekly basis to avoid injury. Participants completed 10 minutes of stretching and instruction in a group exercise room, then moved to an indoor track for walking. As they progressed around the track, they were accompanied by two researchers. These researchers walked along with participants, asking them to gauge their RPE and ability to speak without losing breath, in order to ensure that all participants were performing the exercise correctly. Participants began the study with 10 minutes of stretching, 10 minutes of instruction, 20 minutes walking, and 10 minutes stretching and cool-down. Instruction decreased, and walking increased, in increments of two minutes.
per session, so that participants completed 40 total minutes walking on the last day of the intervention. Participants were provided with homework in the form of an instructional sheet, and were instructed to practice the homework one time per week out-of-session. The homework provided was estimated to take twenty minutes to complete. Class outlines and format may be found in Appendices DD and EE.

**Psychoeducation-Control Group.** Information regarding various interventions for stress management were taught during each session in a lecture style format. Lecture content included information adapted from *The Relaxation & Stress Reduction Workbook* (Davis, Eshelman, & McKay, 2000), and *The Stress Management Handbook* (Leyden-Rubenstein, 1998). Lecture content included theories of stress, coping, and the stress-illness relationship, but participants did not receive explicit instruction in any of the methods described. Two researchers were present at each class: one who provided instruction, and one who managed group sign-in sheets, random drawing, and distribution of homework. Weekly homework consisted of selected readings from *Stress Management for Dummies* (Elkin, 1999), and each took approximately 20 minutes to complete.
CHAPTER III

RESULTS

Scores for measures completed incorrectly were removed before analyses were conducted. For the Daily Hassles and Uplifts measure, only 48% of protocols were completed correctly, though all scores were used in analyses as it is unclear which participants were intentional in their responding. Certain saliva samples were excluded based on collection problems, including: activity just prior to collection, eating and/or drinking just prior to collection, allowing samples to become overheated (e.g., in participant’s car), and providing sample while intoxicated. Remaining scores for completers were included in analyses. Completers’ mean (SD) DASS screening scores were 19.03 (7.20) for the stress scale, 11.00 (7.29) for the depression scale, and 9.17 (7.20) for the anxiety scale. One-way ANOVAs revealed that there were no differences between completers and non-completers at Time 1.

Demographics data for completers indicated that their average age was 21.30 (5.20), and that 39 males and 76 females completed the study. Sixty-six percent of completers self-identified as Caucasian, 29% identified as African-American, four percent identified as Latino, and the remainder identified as “Other.” Fourteen percent of completers were employed full-time (at least 30 hours per week), and 36.5% were not employed. Eighty-one percent of completers were taking a full load of classes (between 12 and 18 hours), and 10.4% were taking an overload of classes, with 7.8% of completers attending classes only part-time.

Eighty-four percent of completers identified as Christian, with the majority (52.5%) of these individuals reporting a Baptist affiliation, and 20% reporting a Catholic
affiliation. The majority of completers (43.5%) reported attending church services at least one or two days per month, 30.5% reported attending services at least once per week, and 7.8% reported that they never attend church services. Over half of completers (53.9%) reported that they prayed at least once weekly, and 28.7% reported that they prayed at least once daily. Sixty-three percent of completers reported that they would consider non-traditional approaches to healing, and 8.7% reported that they were currently practicing yoga, with four participants practicing yoga on a daily or weekly basis. Over half of completers (62.7%) expected their participation in the respective groups to be “quite” or “very beneficial,” and only one completer expected that group participation would have “no benefit.”

More than half of participants (57%) reported that their living arrangements were affected by Hurricane Katrina, with 55.1% reporting minimal damage to their primary residence, and 18.7% reporting severe damage. Nearly 87% of participants reported being without power and/or water for periods of a few days to longer than one week, following Katrina, and roughly 24% being displaced for a few days, and roughly 39% being displaced for longer than one week. Six participants reported that they were still displaced at the end of the study. The majority of participants (70.5%) reported being “as” concerned about their grades as they were before the storm, and 23.8% reported that they were “more” or “much more” concerned about grades. More than half (61.3%) of participants reported that their grades were “the same” as they were before Hurricane Katrina, and 68.9% reported attending class “as often” as they did prior to the storm. Most participants (74.5%) reported that they had kept “the same basic beliefs and activities” that were in place before the storm, roughly 70% attended church “as often” as
they did before, and 16.2% reported attending church “more” or “much more” often than they did before Katrina. Nearly 70% (68.2%) of participants reported that, since the storm, they prayed or meditated “as often” as they had prior, and 29% reported praying or meditating “more” or “much more” often. When asked whether they would be willing to volunteer for a fictional relief organization that was being organized on campus, 59% declined.

Though there were no pre-existing differences by group, several demographic variables were correlated at Time 1 among completers. These correlations may be seen in Table 1, with sex entered as “1” for Male, and “2” for Female. Hours studied per week were positively correlated with age ($r = .21$ ($p = .02$)). Hours worked per week were positively correlated with age ($r = .30$ ($p < .001$)), and negatively correlated with church ($r = -.25$ ($p = .01$)) and prayer ($r = -.23$ ($p = .02$)) frequency. Prayer frequency was also correlated with sex ($r = .29$ ($p < .001$)), church frequency ($r = .46$ ($p < .001$)), and amount donated to church ($r = .39$ ($p < .001$)). Church frequency was correlated with sex ($r = .29$ ($p < .001$)), as well as amount of church donations ($r = .22$ ($p = .02$)). Regarding health behaviors, age and cigarette use were positively correlated ($r = .19$ ($p = .04$)), and cigarette use was negatively correlated with prayer frequency ($r = -.19$ ($p = .04$)). Alcohol consumption was similarly negatively correlated with prayer frequency ($r = -.28$ ($p < .001$)), in addition to church donations ($r = -.24$ ($p = .01$)). Alcohol consumption was also negatively correlated with sex ($r = -.19$ ($p = .04$)), with females reporting less alcohol consumption. Exercise was positively correlated with amount of church donations ($r = .19$ ($p = .04$)).
Demographic variables were also related to several dependent variables at Time 1 (see Table 2). Hopefulness was correlated with sex ($r = .19$ ($p = .05$)) and prayer frequency ($r = .20$ ($p = .04$)). Sex was also correlated with somatic complaints ($r = .33$ ($p < .001$)). Anxiety was correlated with number of hours worked per week ($r = .19$ ($p = .05$)). A sense of purpose in life was correlated with church attendance ($r = .19$ ($p = .04$) and prayer frequency ($r = .20$ ($p = .03$)), and amount donated to church ($r = .20$ ($p = .04$)), as well as number of hours per week spent studying ($r = .23$ ($p = .01$)). Spiritual meaning showed similar correlations with church ($r = .20$ ($p = .04$)) and prayer ($r = .22$ ($p = .02$)) frequency, and amount of church donations ($r = .22$ ($p = .02$)).

Correlations among dependent variables at Time 1 may be seen in Table 3. Stress was correlated with depression ($r = .57$ ($p < .001$)), anxiety ($r = .61$ ($p < .001$)), somatic complaints ($r = .30$ ($p < .001$)), purpose in life ($r = -.20$ ($p = .03$)), and resting heart rate ($r = .22$ ($p = .02$)). Depression was also correlated with anxiety ($r = .41$ ($p < .001$)), hopefulness ($r = -.21$ ($p = .03$)), somatic complaints ($r = .18$ ($p = .05$)), purpose in life ($r = -.43$ ($p < .001$)), and spiritual meaning ($r = -.26$ ($p = .01$)). Anxiety was also correlated with somatic complaints ($r = .41$ ($p < .001$)). Hopefulness was correlated with purpose in life ($r = .44$ ($p < .001$)), spiritual meaning ($r = .35$ ($p < .001$)), and shoulder ($r = .27$ ($p < .001$)) and trunk ($r = .28$ ($p < .001$)) flexibility. Purpose in life and spiritual meaning were also correlated ($r = .49$ ($p < .001$)), and shoulder and trunk flexibility were correlated with one another ($r = .39$ ($p < .001$)).

Correlations indicate that female participants were more likely to engage in prayer more frequently, attend church more often, and consume less alcohol than males. The older a participant, the more likely he or she was to work and study more hours per week,
and was also more likely to use cigarettes. Those participants who prayed more frequently were less likely to consume alcohol or use cigarettes, and had higher scores for hope, spiritual meaning, and purpose in life. Those who reported more anxiety also reported more stress and more somatic complaints.
Table 1

Correlations among demographic variables at Time 1 (N=115)

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Note. *p<.05, **p<.01.
### Table 2

**Correlations between demographic and dependent variables at Time 1**

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Note. *p<.05, **p<.01.
Table 3

**Correlations among dependent variables at Time 1**

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**Note.** *p<.05, **p<.01
Main Analyses

Results were analyzed using a Mixed Model ANOVA (or ANCOVA when there were pre-existing demographic differences). In the Mixed Model analyses, study group was the grouping variable (integrated yoga group, yoga as exercise group, walking group, psychoeducation control group), and time of administration of questionnaires and physiological measures (pre, post) was the repeated measures variable. Mixed Model Analyses revealed a main effect of time for depression ($F(1,110) = 12.07, p<.001$), with Depression mean for completers decreasing from 9.72 (7.76) to 7.08 (7.54). There was also a main effect of time for stress ($F(1,110) = 21.10, p<.001$), with Stress mean for completers decreasing from 17.47 (9.14) to 13.40 (9.11), but no time by group interactions on either Depression or Stress. There were no effects for group, and no interactions, for any of the other psychological dependent variables. In the analyses, church attendance, prayer frequency, and church donations were covaried with Herth Hope, Purpose in Life, and Spiritual Meaning Scale scores. Sex and number of credit hours were covariates for Patient Health. Number of credit hours and number of hours worked per week were covariates for Anxiety.

Because Daily Hassles are understood to moderate stress, and because Daily Hassles correlated with Stress, Depression, and Anxiety at Time 2, Time 2 Daily Hassles were analyzed as a moderator variable for Stress. Results were not significant for Stress, Depression, Anxiety, or Hope, which was also included in the analysis for moderator effects.
Means for each of the dependent variables may be seen in Table 4. Cohen’s d was calculated on each variable, for each group, in order to determine effect size. Results may be seen in Table 5.

Table 4

**Means (and Standard Deviations) for dependent variables at Time 1**

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Table 5. **Effect sizes for mean differences between Time 1 and Time 2 for each dependent variable, by group.**

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With regard to physiological dependent variables, a significant Time x Group interaction was obtained for resting heart rate (F(3,111) = 6.75, p<.001). This interaction is graphed in Figure 1.
Follow-up analysis of simple effects indicated an effect across time for the integrated yoga group ($F(1, 115) = 34.88, p<.001$), the yoga as exercise group ($F (1,115) = 18.70, p<.001$), and the walking group ($F(1,115) = 22.97, p<.001$), but not for the questionnaire control group. The integrated yoga group’s mean resting heart rate fell from 76.81 (SD = 8.98) at Time 1 to 67.81 (SD = 8.68) at Time 2. Mean resting heart rates for the yoga as exercise group also indicated a significant difference between Time 1 ($M = 75.28, SD = 10.17$) and Time 2 ($M = 66.96, SD = 8.76$), and the walking group similarly indicated a significant difference from Time 1 ($M = 76.60, SD = 9.28$) to Time 2 ($M = 67.80, SD = 9.49$). There were also main effects of time ($F(1,111) = 55.65$, $p<.001$), with mean heart rate falling from 76.43 (SD = 9.48) to 69.97 (SD = 10.02), and group ($F(3,111) = 2.80, p=.04$). Tukey’s HSD indicated a trend toward significance between yoga as exercise and psychoeducation control groups, though the comparison was not significant.
A significant Time x Group interaction was also obtained for trunk flexibility (F(3, 109) = 7.51, p<.001). Analysis of simple effects indicated a difference over time for the integrated yoga group (F(1,113) = 11.17, p<.01) and the yoga as exercise group (F(1,113) = 14.12, p<.01), but not for the walking or psychoeducation control groups. The integrated yoga group's mean trunk flexibility increased from Time 1 (M = 38.97, SD = 6.51) to Time 2 (M = 41.56, SD = 6.06). Mean trunk flexibility ratings for the yoga as exercise group also indicated a mean increase from Time 1 (M = 38.98, SD = 7.01) to Time 2 (M = 41.40, SD = 6.25). Though there was no main effect for group, there was a significant effect of time for trunk flexibility (F(1,109) = 11.37, p<.001), with mean flexibility measurement increasing from 39.13 (SD = 6.66) to 40.42 (SD = 6.48). The interaction is plotted in Figure 2.

![Figure 2. Interaction for trunk flexibility.](image-url)
Shoulder flexibility also yielded a Time x Group interaction (F(3,109) = 3.96, p=.01), which is plotted in Figure 3. As was the case with trunk flexibility, analyses of simple effects at Times 1 and 2 indicated significant differences across time for both the integrated yoga group (F(1,113) = 8.68, p=.01), and the yoga as exercise group (F(1,113) = 13.16, p=.001), but not the walking or psychoeducation control groups. Shoulder flexibility for the integrated yoga group increased from Time 1 (M = 40.28, SD = 13.37) to Time 2 (M = 43.56, SD = 13.41), and also for the yoga as exercise group from Time 1 (M = 43.26, SD = 16.61) to Time 2 (M = 48.20, SD = 15.98). This variable yielded no effect for group, but did indicate an effect of time (F(1,109) = 10.72, p<.001), with a mean increase from 41.40 (SD = 15.18) to 43.65 (SD = 14.45).

![Figure 3. Interaction for shoulder flexibility.](image)

There was not a Time x Group interaction, or an effect of time, for salivary cortisol, though there was an effect of group (F(3,92) = 8.37, p<.001). Tukey’s HSD revealed significant mean differences between the integrated yoga (M = 63.14, SD = 11.34) and yoga as exercise (M = 90.29, SD = 12.36) groups. The yoga as exercise
group’s mean salivary cortisol was also different from that of the walking (M = 50.95, SD = 11.12) and psychoeducation control (M = 56.95, SD = 11.56) groups.
CHAPTER IV
DISCUSSION

The current study was conducted as a follow-up and elaboration on a study that had promising findings indicating that yoga may be an effective intervention for general distress. It was thought that the screening criteria were too broad in the original study, and this was addressed in the current study by limiting inclusion criteria to only those persons who endorsed elevated stress without elevations on the DASS depression and anxiety scales that may have suggested severe anxiety disorders. In addition to elaborating on the previous study, the current study was designed to refine the procedures involved in the yoga intervention, and enable generalization to a broader population and broader study. In an effort to increase generalizability and address any treatment effects that may have been due to a single experimenter instructing all classes and obtaining all measures with the individual participants, both tasks involving a great amount of attention and one-on-one time with each participant, a research team was trained and involved in group instruction and measure collection. A psychoeducation-control condition was also utilized in place of a questionnaire-control group to address effects that may have been due to experimenter attention.

In the previous study, effects were observed in a short time, only four weeks into the intervention, or after eight sessions were offered. In the current study, differences across time for physiological measures, including resting heart rate and tests of flexibility, suggest that the exercises taught in class were performed correctly. Significant differences across time for resting heart rate in both yoga groups, as well as the walking group, suggest that all of the exercise groups were experiencing physiological benefits.
beyond that of the psychoeducation control group. Stress and depression scores fell across time for all participants, and though there were no significant interactions by group, the direction of mean scores for each group suggests that the integrated yoga, yoga as exercise, and walking groups were self-reporting benefit beyond that of the control group.

Effects across time may be partially due to the participants' collective expectation that the interventions, including psychoeducation control condition, held promise as relief from stressors, as evidenced by the majority of participants expecting the intervention to be, at least, "quite beneficial," and only one participant expecting no benefit at all. Narrowing the inclusion criteria may have had little effect in this particular experiment, if one generalizes the findings to a broader sample of this particular collegiate population. It is unknown whether persons with more severe symptoms would have reported different effects, but it is possible, based on the current findings, that the placebo effect would have been minimized, and a broader range of scores with higher DASS subscale elevations would have shown larger effects.

Although protocols from the previous study were somewhat detailed, they lacked elaboration that would allow exact replication by other experimenters. This weakness was addressed with detailed instructions and a rigorously trained research team. Despite the attempt to make instruction as uniform as possible, it is likely that there was still some variation between instructors due simply to level of experience. Though instructors were randomly assigned to the interventions, each had different abilities and areas of expertise within each intervention. For example, three of the five instructors trained for this study were unfamiliar with the traditional forms of yoga with their spiritual framework. One of
these three instructors is a certified personal fitness and yoga instructor, making her particularly strong as an instructor for yoga as exercise. Because she had no prior knowledge of the spiritual teachings of yoga, however, it is possible that she was unable to provide the integrated yoga classes she taught with the same quality spiritually focused impromptu instructional language that one of the more seasoned traditional yoga instructors was able to provide. This may have contributed to increases in within group variance, making group differences difficult to detect.

Although the current study presented challenges because of multiple instructors, and differences in prior training, it also had several strengths. Among these, the tightly scripted approach to instruction ensured that the yoga classes were indeed different in content. Anecdotal evidence suggests that, if one were to take a yoga class in a gym setting, which is where this study was conducted, the instructors may draw upon their training in Hatha yoga devoid of spiritual content, but will combine spiritual aspects from personal experience. This may be due to the instructors’ own independent study, or it may be due to efforts to satisfy participants’ expectations that yoga will be a spiritual experience. Whatever the case, the delineation between yoga as exercise, which is what those gym classes are designed to be, and a traditional yoga practice, referred to in the current study as integrated yoga, becomes blurred. Scripting and providing the research team with background information and instruction contributed to the integrity of the interventions offered. Further, randomization of participants to groups as much as possible, and randomization of instructors to conditions increased the likelihood that each participant’s reported effects were genuine and that observed effects would be due to interventions offered. Assuming that instructors had strengths and weaknesses in certain
areas, that they were able to effectively deliver instruction is evidenced in the physiological effects of increased flexibility for the integrated yoga and yoga as exercise groups, and decreased resting heart rate in all groups except the psychoeducation control group.

The prior study did not indicate changes on spiritual measures, but did indicate increased hopefulness, for both integrated yoga and yoga as exercise groups. In order to better assess the spiritual change that one might expect from participation in the integrated yoga intervention, the Spiritual Meaning Scale (SMS) was added to the battery. Specifically, the SMS has been designed to measure the extent to which an individual identifies with a power higher than self, or feels connection with something larger than self, to a greater degree than the PIL (Mascaro, Rosen, & Morey, 2004). This measure, then, seems particularly well-suited to measuring the changes that were hypothesized for the integrated yoga group. Mascaro and Rosen (2006) found that the SMS is negatively correlated with the Depression scales of the DASS, and correlates with Herth’s hope measure. Results from the current study support both of these findings about the SMS. In examining the data from the current study, the general trend in SMS, DASS Depression, and HHS scores, though not significant, is consistent with previous research. Although the integrated yoga intervention was designed with a spiritual focus, the participants did not report significant changes on variables assessing spiritual development.

In examining the question of spiritual change in the study’s sample, it seems relevant to consider both the environmental context of the study itself and the participants’ collective spiritual beliefs. This study was conducted in the wake of
Hurricane Katrina, with participants being screened and beginning the interventions roughly six months after the storm. The university where the study was conducted was in an affected region, the majority of students had permanent residences in areas affected by the storm, and repairs and reconstruction in the region were ongoing throughout the duration of the study. Although it is likely that participants were affected by that event, individuals who experienced severe psychological effects were screened out because of their elevated scores on the DASS Depression and Anxiety subscales.

Although individuals participating in the current study did not endorse severely elevated depression and anxiety scores, it is possible that they experienced some psychological distress because of the hurricane. If salivary cortisol is used an one physiological marker for stress, participants in the current study may be considered more stressed than completers in the prior study by Smith and Greer (2005). In the original study, conducted two years prior with the same population, the mean cortisol score for completers was 23.43 (15.72), though in the current study, completers’ mean cortisol score was 63.78 (36.55). This suggests that, within this particular population, changes had occurred in the interim period between the studies.

Prior to the end of the study, a questionnaire was developed and administered to assess the participants’ experiences with Katrina, and to determine whether the participants had experienced any lifestyle changes since the storm. Though a majority of participants reported being without water and/or power for periods of a few days to more than one week, at least minimal damage to their primary residence, and being displaced for periods of a few days to being still displaced at the study’s conclusion, the majority of participants (74.5%) reported making no changes to basic religious beliefs and activities.
Roughly 70% of participants also reported that they were attending church and praying or meditating as often as they did before the storm.

In such an environmentally impacted sample, one might anticipate that scores on self-report measures of psychological distress, such as the DASS, that includes reported stress, depression, and anxiety, would be elevated. Some authors, however, suggest that traumatic events, including natural disasters, have the potential effect of causing “post-traumatic growth,” or PTG (Tedeschi, Park, & Calhoun, 1998). An underlying theme of PTG is that, in the face of loss and devastation, individuals may find new reserves of psychological strength and a renewed sense of community. The result is a transformative process in which individuals develop new coping mechanisms, using previously employed systems as a base. PTG suggests that individuals who have experienced some phenomenon develop better, newer adaptation skills. Schaefer and Moos (1998) have proposed a model of PTG in which a personal system (including sociodemographics, health status, and self-efficacy) and an environmental system (including social supports from family and others, and aspects of community, home, and financial resources) act to affect how an individual will respond to a critical event, such as Hurricane Katrina. Following such an event, the authors suggest that cognitive appraisal and coping responses may lead to positive outcomes. These outcomes may include improved use of social supports and better relationships, altruism, and/or better coping skills to help regulate affect (Schaefer & Moos, 1992).

Hurricane Katrina caused an initial devastating blow to the region, but its effects also lingered throughout the course of the current study. Schaefer and Moos (1998) suggest that an acute level of distress, followed by ongoing related stress, may result in
more opportunity for personal growth and transformation. For the participants in the current study, then, they may have been in the process of evaluating and adapting to the extended storm effects. In addition, certain individuals seem to be better candidates for this type of growth, and this may be especially relevant to the sample included in the current study. Finkel and Jacobsen (1977) found that persons in their 20’s and younger 30’s were better able to adapt and “convert” traumatic experiences into positive ones. They found that, the older an individual was at the time of a traumatic stressor, the less likely she or he would be to perform the “conversion” task. Carr et al. (1995) similarly found that younger individuals coped better than people aged 45 or older in a post-disaster environment, and the authors suggest that the possibility of a lifetime to repair the environment may have an effect, as well as the general physical health associated with youth.

Following a natural disaster, research has shown that individuals often seek the support of others (Coffman, 1994), and that individuals who have been affected by the same disaster show more empathy and concern for their peers (Saylor, Swenson, & Powell, 1992). After Hurricane Hugo, Kaniasty and Norris (1995) found that individuals with pre-existing social supports fared better than their counterparts who lacked social resources. Puddifoot (1995) suggests that a “shared community” experience of a natural disaster leads to a cohesive sense of community, which may lead to a greater degree of perceived support. The study sample may have benefited from their inclusion in a larger university campus community, as well as an implicit sense of connection with the community at large.
In addition to age and social systems, participants may also have been affected by their pre-existing spiritual and religious belief system(s). The vast majority (84%) of the sample identified as Christian, with less than 10% of participants reporting that they “never attended” church services. In addition to an apparent devotion to attendance, this sample also may be understood as behaving in a religious lifestyle, with nearly 84% of participants praying on a weekly or more frequent basis. That nearly all (90%) of participants report regularly donating money at church, too, suggests that this group may be understood as devout in their general Christian make-up, possibly creating a ceiling effect for the spirituality measures.

In coping with traumatic events, some individuals use their pre-existing spiritual beliefs to cope (Pargament, 1990) and reframe the experience (Overcash, Calhoun, Cann, & Tedeschi, 1996). Some individuals also find that they have a stronger conviction post-event than they did prior. This is perhaps one of the most salient points in considering the lack of spiritual change in the current sample, especially in consideration of the lack of change in the integrated yoga group. An alternative to the ceiling effect explanation may be that, by introducing a spiritual belief system that may be understood by some of the participants as inconsistent with their pre-existing belief system, they may have been unable to allow for spiritual exploration and the cognitive dissonance it might engender.

Rather than consider the current study as failing in its efforts to elicit psychological, physical, and spiritual change over time, it is equally possible to examine the findings as evidence of a hardy and resilient population. The participants’ responses to the environmental stressors in place at the time of the study, and their self-reported devotion to a belief system that was in place prior to the study being conducted may have
buoyed them in such a way as to promote PTG, or to at least minimize potential traumatic effects. In the current study, the overall youth of the sample may have offered them some benefit as they faced, and continue to face, the struggles of living in a Katrina-affected region. They may also have benefited from Katrina’s relatively low number of fatalities, as reported for the state of Mississippi (Bourque, Siegel, Kano, & Wood, 2006). Rubonis and Bickman (1991) found that more extensive community-wide bereavement could stifle the opportunity for PTG. Finding themselves in the relatively structured environment of a university campus, with its attendant social constructs, the participants may also be finding benefit in the social networks that were in place prior to the storm. Other social supports may also have been active for the participants, either through campus, church ministries, or government-sponsored organizations, that were outside the knowledge of the researchers. Too, the researchers themselves may have been experiencing a parallel process with the participants, though information on this possibility is unavailable.

Examining the current study’s results through the lens of Selye’s theory, one might expect that the participants in the integrated yoga group, one with an ethical component, would display more altruistic behaviors. However, there were no group differences in participants who would be willing to volunteer for a hurricane relief organization, and more than half of all participants declined to participate. The cognitive aspect of stress relief is likely important to consider in this population, and cognitive appraisal results are not available. The Daily Hassles and Uplifts would have provided information on how participants appraised the events that occurred just prior to, and during, the study. Unfortunately, the cognitive appraisal process that was active within
the study participants cannot be determined, as very few respondents completed the DHU correctly, making the scores unreliable.

In considering further study, it seems likely that the current study results are aberrant when compared with prior yoga research, and must be considered as much the effects of the interventions offered as they are the results of a community-wide traumatic event. Smith and Greer's prior study (2005) offered the promise of a spiritual and physical practice that might benefit stressed individuals, with robust findings for decreased self-report of psychological distress and positive physiological change over a brief period of time. In the current study, it was hypothesized that all exercise groups would report decreased stress, but that the integrated yoga group would experience the most benefit of all groups, as it incorporates exercise, meditation, and spirituality, creating an additive effect. Though both yoga groups reported greater flexibility benefit, and all exercise groups experienced reduced resting heart rate, suggesting better overall health, the integrated yoga group did not experience the cortisol effects or changes in hope that occurred in the first study. Results of the current study likely do not contraindicate these findings, however, and replication may be beneficial in determining possible favorable effects.

Certain suggestions may be advisable when considering replication. Downward trends for mean depression, anxiety, and stress scores among the yoga groups, though not significant in the current study, suggest that change may have been occurring at a slower pace than in the previous study, and a longer duration may elicit favorable results on self-reporting mood measures. The slower rate of change in the current study may be due to the factors previously mentioned that are specific to this population and sample, but
longer experience in the integrated yoga and yoga as exercise groups may also allow any stressed population more opportunity to apply the skills learned in class to daily life. The integrated yoga group, in particular, may require more attention to the spiritual aspects of the practice. It seems that the asanas (postures) had a physical effect, as evidenced by both yoga groups’ increased flexibility and decreased resting heart rate. Integration of the ethical and spiritual lessons of yoga, the yamas and niyamas, may require more education and practice in order to result in noticeable changes on spiritual measures.

Physical measurement seems to suggest that the yoga groups experienced changes above and beyond both the walking and psychoeducation control groups. Salivary cortisol, however, did not reflect a physiological change on a biochemical level. In saliva collection for the current study, steps were taken to minimize spoilage of the samples. From careful and thorough individualized instruction on how to collect the samples, to elimination based on activity or consumption of foods or liquids just prior to collection, precaution was used in order to produce the best possible sample for analysis. In spite of this, salivary cortisol results are precarious because of their fluctuations dependent on conditions that are not easily controlled by the experimenter. In future studies, it may be advisable to include Immunoglobulin-A or other stress markers that are more robust than cortisol.

Replication within another population may also be advisable, or within the current study’s population at a later date, in order to allow the region to recover from Hurricane Katrina. That the hurricane would have some effect on the outcome of the current study is an unfortunate given, but results indicate that, within this population, individuals are amenable to attempts to relieve the stress that may be associated with living in the region.
APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

The University of Southern Mississippi
118 College Drive #5147
Hattiesburg, MS 39406-
Tel: 601.266.6820

Institutional Review Board
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 21, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects. Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data. Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 26021401
PROJECT TITLE: Effects of Yoga on Stress
PROPOSED PROJECT DATES: 01/01/06 to 06/30/06
PROJECT TYPE: Dissertation or Thesis
PRINCIPAL INVESTIGATORS: Jay Andy Smith
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Psychology
FUNDING AGENCY: N/A
HSPRC COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 02/14/06 to 02/13/07

Lawrence A. Hosman, Ph.D. HSPRC Chair 2006 Date
Title of Study: Effects of Group Participation on Stress in College Students

The purpose of the current study is to determine if participation in structured groups improves psychological functioning. Specifically, this study will attempt to determine if changes in stress, health, and well being are affected by group participation.

If you choose to participate in this study, you will be assigned to one of four groups: two yoga groups, a walking group, or an education group. Each group will meet twice a week, for seven weeks, with each meeting lasting approximately one hour, for a total of 14 hours. Also, you will be asked to complete a questionnaire packet, provide two saliva samples, and perform physical measures that the researcher will demonstrate to you at the time of the experiment. Questionnaires and physical measures will be completed at the beginning and end of the study, during your regular group meeting time. You will be asked to appear in person to complete each of these data collection sessions, in addition to your weekly group meetings. Finally, there will be one 20-minute homework assignment each week. The homework will be similar to the group activities.

You understand that if you participate in this study, you will provide saliva samples on two (2) occasions that will be analyzed for a variety of proteins and hormones associated with immune function. You understand that the collection of saliva will require you to sit quietly for fifteen (15) minutes and then collect your own saliva for four (4) minutes on each occasion. You understand that collection containers will be provided to you for each collection time.

You understand that you will have your flexibility measured by a trunk flexibility test. This test will require you to lie prone on a mat on the floor. You will place your hands behind your back and raise your head up as high as you can in a slow and controlled manner. You will repeat this three (3) times.

You understand that you will have your flexibility measured by a shoulder flexibility test. This test will require you to lie prone on a mat on the floor, while holding a wooden dowel with your hands. You will then raise your hands up as high as you can in a slow and controlled manner while keeping your chin on the mat. You will repeat this three (3) times.

You understand that there are no known risks associated with the collection of saliva. Furthermore, you understand that all collection and storage containers will be pre-labeled with a subject code that will not reveal your identity.

You understand that the only known risk associated with flexibility testing is a strain or sprain of the muscle or connective tissue. To minimize the risk of a strain or sprain, you...
will be allowed to warm-up and stretch as much as you feel you need to, prior to performing the flexibility tests.

It is important to note that, if you are assigned to participate in the yoga or walking groups, you will be required to complete an Assumption of Risk form upon arriving at each group meeting. The Assumption of Risk states: “Anyone who participates in Rec Sports activities will be doing so at his/her own risk. Rec Sports and the University are not liable for any accident, injury, loss or damage to personal property suffered by a participant while in facilities managed by Rec Sports or participating in any Rec Sports activity. Rec Sports and the University do not carry any insurance program to cover participants. Participation in any Rec Sports is on a voluntary basis. All participants are strongly encouraged to undergo a health evaluation and consult with their personal physician indicating fitness level appropriateness for strenuous activity prior to participating in any Rec Sports activity.” Your participation in this study is completely voluntary, and you are free to withdraw at any time. Through participation in this study, you may benefit from participation in groups designed to alleviate distress, including: depression, anxiety, or stress.

All information obtained during this study is confidential. We protect your privacy by withholding participants’ names and other identifying information from all persons not connected with the study. In addition, you will be assigned a “password” that will be used to group your questionnaires and physical measurements, and further ensure that confidentiality is maintained. This research has been approved by the Institutional Review Board of the University of Southern Mississippi. You may ask questions regarding this study, questionnaires, and physical measurements at any time. Should you have questions, please contact J. Andy Smith at 266-4588, or Dr. Tammy Greer at 266-6336. Any questions or concerns about rights as a participant should be directed to the Chair of the Institutional Review Board, USM Box 5147, (601) 266-6820.

You will receive a copy of this Informed Consent to keep for yourself.

If you are not able to participate in any form of physical exercise, please check here ____

If you agree to participate in this study, complete the following information.

Name _________________________________

E-mail _________________________________

Phone _________________________________
APPENDIX C

INFORMED CONSENT FOR SCREENING

We are interested in selecting participants for a study on alternative treatments for psychological distress in college students. Some of you will be chosen for participation in this study, and some of you won’t, based on information obtained from the screening instrument. You will receive more information about the study if you are chosen to participate, using the contact information that you provide below. The study will involve twice-weekly participation sessions, and additional time will be required to complete physical measures and questionnaires. You will receive one point of extra credit for participating in the screening, if your professor allows extra credit. You will likely receive the maximum amount of extra credit allowed by your instructor, if extra credit is allowed, by participation in this study.

Because we are examining psychological distress, you will be provided with a list of psychological services available in the Hattiesburg area.

Contact information:

Name ________________________________

E-mail ________________________________

Phone ________________________________

Alternate phone ________________________________

Alternate phone ________________________________
APPENDIX D

SCHEDULING FORM

Below, please put an “X” through times when you are in class, or when you know you will have to work. This will assist the researcher in determining optimal times for group meetings.

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APPENDIX E

DEPRESSION ANXIETY STRESS SCALES

Instructions: Please read each statement and circle a number 0, 1, 2, or 3 that indicates how much the statement applies to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 – Did not apply to me at all
1 – Applied to me to some degree, or some of the time
2 – Applied to me to a considerable degree, or a good part of the time
3 – Applied to me very much, or most of the time

1) I found it hard to wind down 0 1 2 3
2) I was aware of dryness of my mouth 0 1 2 3
3) I couldn’t seem to experience any positive feeling at all 0 1 2 3
4) I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion) 0 1 2 3
5) I found it difficult to work up the initiative to do things 0 1 2 3
6) I tended to over-react to situations 0 1 2 3
7) I experienced trembling (e.g. in the hands) 0 1 2 3
8) I felt that I was using a lot of nervous energy 0 1 2 3
9) I was worried about situations in which I might panic and make a fool of myself 0 1 2 3
10) I felt that I had nothing to look forward to 0 1 2 3
11) I found myself getting agitated 0 1 2 3
12) I found it difficult to relax 0 1 2 3
13) I felt down-hearted and blue 0 1 2 3
14) I was intolerant of anything that kept me from getting on with what I was doing 0 1 2 3
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<td>15) I felt I was close to panic</td>
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<td>16) I was unable to become enthusiastic about anything</td>
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<td>17) I felt I wasn’t worth much as a person</td>
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<td>18) I felt I was rather touchy</td>
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<td>19) I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)</td>
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<td>20) I felt scared without any good reason</td>
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<td>21) I felt that life was meaningless</td>
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## APPENDIX F

### PURPOSE IN LIFE TEST, PART A

Please complete each item by marking a single response.

1. I am usually:

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</table>

2. Life seems to me:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>completely always exciting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>routine</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

3. In life I have:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>no goals or very clear aims at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>aims at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. My personal existence is:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>utterly very purposeful and meaningful</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>meaningless without purpose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Every day is:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>exactly constantly new and different</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>the same</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. If I could choose, I would:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>prefer never like nine more lives just like this one</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>to have been born</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. After retiring, I would:

1. loaf 2. completely 3. the rest of my life

8. In achieving life goals, I have:

1. made no progress whatsoever 2. 3. 4. 5. 6. 7. progressed to complete fulfillment

9. My life is:

1. empty, filled only with despair 2. 3. 4. 5. 6. 7. running over with exciting good things

10. If I should die today, I would feel that my life has been:

1. completely worthless 2. 3. 4. 5. 6. 7. very worthwhile

11. In thinking of my life, I:

1. often wonder why I exist 2. 3. 4. 5. 6. 7. always see a reason for my being here

12. As I view the world in relation to my life, the world:

1. completely confuses me 2. 3. 4. 5. 6. 7. fits meaningfully with my life
13. I am a:

1  2  3  4  5  6  7
very very
irresponsible responsible
person person

14. Concerning man's freedom to make his own choices, I believe man is:

1  2  3  4  5  6  7
completely absolutely free
bound to make all life
by life
limitations of choices
heredity and
environment

15. With regard to death, I am:

1  2  3  4  5  6  7
unprepared prepared and
and unafraid
frightened

16. With regard to suicide, I have:

1  2  3  4  5  6  7
thought of it never given it
seriously as a second thought
a way out

17. I regard my ability to find a meaning, purpose, or mission in life as:

1  2  3  4  5  6  7
practically very great
none

18. My life is:

1  2  3  4  5  6  7
out of my in my hands and
hands and I am in control
controlled by of it
external factors
19. Facing my daily tasks is:

1  2  3  4  5  6  7
a painful
and boring
experience

a source of
pleasure and
satisfaction

20. I have discovered:

1  2  3  4  5  6  7
no mission
or purpose in
life

clear-cut goals
and a satisfying
life purpose
## APPENDIX G

### PATIENT HEALTH QUESTIONNAIRE: 15-ITEM

### SOMATIC SYMPTOM SEVERITY SCALE

During the *past four weeks*, how much have you been bothered by any of the following problems?

<table>
<thead>
<tr>
<th></th>
<th>Not bothered at all</th>
<th>Bothered a little</th>
<th>Bothered a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Stomach pain</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>b. Back pain</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>c. Pain in your arms, legs, or joints (knees, hips, etc.)</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>d. Menstrual cramps or other problems with your periods (women only)</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>e. Headaches</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>f. Chest pain</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>g. Dizziness</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>h. Fainting spells</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>i. Feeling your heart pound or race</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>j. Shortness of breath</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>k. Pain or problems during sexual intercourse</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>l. Constipation, loose bowels, or diarrhea</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>m. Nausea, gas, or indigestion</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>n. Feeling tired or having low energy</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>o. Trouble sleeping</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
APPENDIX H
HERTH HOPE SCALE

Listed below are a number of statements regarding hope. Read each statement and decide whether it applies to you personally. There are no right or wrong answers. Place a check [X] in the appropriate box indicating how often the statement has applied to you in the past week or two.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never applies to me</th>
<th>Seldom applies to me</th>
<th>Sometimes applies to me</th>
<th>Often applies to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am looking forward to the future.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I sense the presence of loved ones.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. I have deep inner strength.</td>
<td></td>
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<tr>
<td>4. I have plans for the future.</td>
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<tr>
<td>5. I have inner positive energy.</td>
<td></td>
<td></td>
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<tr>
<td>6. I feel scared about my future.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. I keep going even when I hurt.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8. I have a faith that gives me comfort.</td>
<td></td>
<td></td>
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<tr>
<td>9. I believe that good is always possible.</td>
<td></td>
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</tr>
<tr>
<td>10. I feel at a loss, no where to turn.</td>
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<tr>
<td>11. I feel time heals.</td>
<td></td>
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<tr>
<td>12. I have support from those close to me.</td>
<td></td>
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</tr>
<tr>
<td>13. I feel overwhelmed and trapped.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I can recall happy times.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15. I just know there is hope.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I can seek and receive help.</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th>Never applies to me</th>
<th>Seldom applies to me</th>
<th>Sometimes applies to me</th>
<th>Often applies to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>I am immobilized by fears and doubts.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I know my life has meaning and purpose.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I see the positive in most situations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I have goals for the next 3-6 months.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>I am committed to finding my way.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I feel all alone.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>I have coped well in the past.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I feel loved and needed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I believe that each day has potential.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>I can't bring about positive change.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>I can see a light even in a tunnel.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>I have hope even when plans go astray.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>I believe my outlook affects my life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>I have plans for today and next week.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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APPENDIX I

DAILY HASSLES AND UPLIFTS SCALES

Hassles Scale: Hassles are irritants that can range from minor annoyances to fairly major pressures, problems, or difficulties. They can occur few or many times in any given time period. Listed below are a number of ways in which a given person can feel hassled.

When you respond to the 117 items, you must have a specific time period in mind. Read each item and circle 0 if the item was no hassle for you in the last four weeks. If it was a hassle, indicate how severe the hassle occurred by circling 1, 2, or 3.

Range of severity

0 = None or did not occur
1 = Somewhat Severe
2 = Moderately Severe
3 = Extremely Severe

Please respond to every question, and go on to the next page to begin.
How much of a hassle was this for you?

<table>
<thead>
<tr>
<th>Issue</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misplacing or losing things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troublesome neighbors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social obligations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inconsiderate smokers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troubling thoughts about your future</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts about death</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health of a family member</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enough money for clothing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enough money for housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concerns about owing money</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concerns about getting credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concerns about money for emergencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Someone owes you money</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial responsibility for someone who doesn’t live with you</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting down on electricity, water, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking too much</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal use of drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too many responsibilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decisions about having children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-family members living in your house</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care for pet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Planning meals 0 1 2 3
Concerned about the meaning of life 0 1 2 3
Trouble relaxing 0 1 2 3
Trouble making decisions 0 1 2 3
Problems getting along with fellow workers 0 1 2 3
Customers or clients give you a hard time 0 1 2 3
Home maintenance (inside) 0 1 2 3
Concerns about job security 0 1 2 3
Concerns about retirement 0 1 2 3
Laid-off or out of work 0 1 2 3
Don’t like current work duties 0 1 2 3
Don’t like fellow workers 0 1 2 3
Not enough money for basic necessities 0 1 2 3
Not enough money for food 0 1 2 3
Too many interruptions 0 1 2 3
Unexpected company 0 1 2 3
Too much time on hands 0 1 2 3
Having to wait 0 1 2 3
Concerns about accidents 0 1 2 3
Being lonely 0 1 2 3
Not enough money for health care 0 1 2 3
Fear of confrontation 0 1 2 3
Financial security 0 1 2 3
Silly practical mistakes 0 1 2 3
Inability to express yourself 0 1 2 3
Physical illness 0 1 2 3
Side effects of medication 0 1 2 3
Concerns about medical treatment 0 1 2 3
Physical appearance 0 1 2 3
Fear of rejection 0 1 2 3
Difficulties with getting pregnant 0 1 2 3
Sexual problems that result from physical problems 0 1 2 3
Sexual problems other than those resulting from physical problems 0 1 2 3
Concerns about health in general 0 1 2 3
Not seeing enough people 0 1 2 3
Friends or relative too far away 0 1 2 3
Preparing meals 0 1 2 3
Wasting time 0 1 2 3
Auto maintenance 0 1 2 3
Filling out forms 0 1 2 3
Neighborhood deterioration 0 1 2 3
Financing children's education 0 1 2 3
Problems with employees 0 1 2 3
Problems on job due to being a woman or man 0 1 2 3
Declining physical abilities 0 1 2 3
Being exploited 0 1 2 3
Concerns about bodily functions 0 1 2 3
Rising prices of common goods 0 1 2 3
Not getting enough rest 0 1 2 3
Not getting enough sleep 0 1 2 3
Problems with aging parents 0 1 2 3
Problems with your children 0 1 2 3
Problems with persons younger than yourself 0 1 2 3
Problems with your lover 0 1 2 3
Difficulties seeing or hearing 0 1 2 3
Overloaded with family responsibilities 0 1 2 3
Too many things to do 0 1 2 3
Unchallenging work 0 1 2 3
Concerns about meeting high standards 0 1 2 3
Financial dealings with friends or acquaintances 0 1 2 3
Job dissatisfactions 0 1 2 3
Worries about decision to change jobs 0 1 2 3
Trouble with reading, writing, or spelling abilities 0 1 2 3
Too many meetings 0 1 2 3
Problems with divorce or separation 0 1 2 3
Trouble with arithmetic skills 0 1 2 3
Gossip 0 1 2 3
Legal problems 0 1 2 3
Concerns about weight 0 1 2 3
Not enough time to do the things you need to do 0 1 2 3
Television 0 1 2 3
Not enough personal energy 0 1 2 3
Concerns about inner conflicts 0 1 2 3
Feel conflicted over what to do 0 1 2 3
Regrets over past decisions 0 1 2 3
Menstrual (period) problems 0 1 2 3
The weather 0 1 2 3
Nightmares 0 1 2 3
Concerns about getting ahead 0 1 2 3
Hassles from boss or supervisor 0 1 2 3
Difficulties with friends 0 1 2 3
Not enough time for family 0 1 2 3
Transportation problems 0 1 2 3
Not enough money for transportation 0 1 2 3
Not enough money for entertainment and recreation 0 1 2 3
Shopping 0 1 2 3
Prejudice and discrimination from others 0 1 2 3
Property, investments, or taxes 0 1 2 3
Not enough time for entertainment and recreation 0 1 2 3
Yardwork or outside home maintenance 0 1 2 3
Concerns about news events 0 1 2 3
Noise 0 1 2 3
<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Uplifts Scale: Uplifts are events that make you feel good. They can be sources of peace, satisfaction, or joy. Some occur often, others are relatively rare.

When you respond to the items, you must have a specific time period in mind. Read each item and circle 0 if the item was no uplift for you in the last four weeks. If it was an uplift, indicate how often the uplift occurred by circling 1, 2, or 3.

Range of severity

0 = None or did not occur
1 = Somewhat Often
2 = Moderately Often
3 = Extremely Often

Please respond to every question, and go on to the next page to begin.
<table>
<thead>
<tr>
<th>Event</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting enough sleep</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Practicing your hobby</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Being lucky</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Saving money</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Nature</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Liking fellow workers</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Not working (on vacation, laid-off, etc.)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Gossiping (&quot;shooting the bull&quot;)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Successful financial dealings</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Being rested</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Feeling healthy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Finding someone presumed lost</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Recovering from illness</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Staying or getting in good physical shape</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Being with children</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>&quot;Pulling something off;&quot; getting away with something</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Visiting, phoning, or writing someone</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Relating well with your spouse or lover</td>
<td>0 1 2 3</td>
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<tr>
<td>Completing a task</td>
<td>0 1 2 3</td>
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<tr>
<td>Giving a compliment</td>
<td>0 1 2 3</td>
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<tr>
<td>Meeting family responsibilities</td>
<td>0 1 2 3</td>
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<tr>
<td>Relating well with friends</td>
<td>0 1 2 3</td>
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<tr>
<td>Being efficient</td>
<td>0 1 2 3</td>
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<tr>
<td>Experience</td>
<td>Score</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Meeting your responsibilities</td>
<td>0 1 2 3</td>
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<tr>
<td>Quitting or cutting down on alcohol</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Quitting or cutting down on smoking</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Solving an ongoing practical problem</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Daydreaming</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Weight</td>
<td>0 1 2 3</td>
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<tr>
<td>Financially supporting someone who doesn’t live with you</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Sex</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Friendly neighbors</td>
<td>0 1 2 3</td>
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<tr>
<td>Having enough time to do what you want</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Divorce or separation</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Eating out</td>
<td>0 1 2 3</td>
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<tr>
<td>Having enough (personal) energy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Resolving inner conflicts</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Being with older people</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Finding no prejudice or discrimination when you expect it</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Cooking</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Capitalizing on an unexpected opportunity</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Using drugs or alcohol</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Life being meaningful</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Being well-prepared</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Eating</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Relaxing</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
Having the “right” amount of things to do 0 1 2 3
Being visited, phoned, or sent a letter 0 1 2 3
The weather 0 1 2 3
Thinking about the future 0 1 2 3
Spending time with family 0 1 2 3
Home (inside) pleasing to you 0 1 2 3
Being with younger people 0 1 2 3
Buying things for the house 0 1 2 3
Reading 0 1 2 3
Smoking 0 1 2 3
Shopping 0 1 2 3
Buying clothes 0 1 2 3
Giving a present 0 1 2 3
Getting a present 0 1 2 3
Becoming pregnant or contributing thereto 0 1 2 3
Having enough money for health care 0 1 2 3
Traveling or commuting 0 1 2 3
Doing yardwork or outside housework 0 1 2 3
Having enough money for health care 0 1 2 3
Health of a family member improving 0 1 2 3
Resolving conflicts over what to do 0 1 2 3
Thinking about health 0 1 2 3
Being a “good” listener 0 1 2 3
Socializing (parties, being with friends, etc.) 0 1 2 3
Making a friend 0 1 2 3
Sharing something 0 1 2 3
Having someone listen to you 0 1 2 3
Your yard or outside of house is pleasing 0 1 2 3
Looking forward to retirement 0 1 2 3
Having enough money for entertainment and recreation 0 1 2 3
Entertainment (movies, concerts, TV, etc.) 0 1 2 3
Good news on local or world level 0 1 2 3
Getting good advice 0 1 2 3
Recreation (sports, games, hiking, etc.) 0 1 2 3
Paying off debts 0 1 2 3
Using skills well at work 0 1 2 3
Past decisions “panning out” 0 1 2 3
Growing as a person 0 1 2 3
Being complimented 0 1 2 3
Having good ideas at work 0 1 2 3
Improving or gaining new skills 0 1 2 3
Job satisfying despite discrimination due to your sex 0 1 2 3
Free time 0 1 2 3
Expressing yourself well 0 1 2 3
Laughing 0 1 2 3
Vacationing without spouse or children 0 1 2 3
Liking work duties 0 1 2 3
Having good credit 0 1 2 3
Music 0 1 2 3
Getting unexpected money 0 1 2 3
Changing jobs 0 1 2 3
Dreaming 0 1 2 3
Having fun 0 1 2 3
Going someplace that’s different 0 1 2 3
Deciding to have children 0 1 2 3
Enjoying nonfamily members living in your house 0 1 2 3
Pets 0 1 2 3
Car working/running well 0 1 2 3
Neighborhood improving 0 1 2 3
Children’s accomplishments 0 1 2 3
Things going well with employee(s) 0 1 2 3
Pleasant smells 0 1 2 3
Getting love 0 1 2 3
Successfully avoiding or dealing with bureaucracies or institutions 0 1 2 3
Making decisions 0 1 2 3
Thinking about the past 0 1 2 3
Giving good advice 0 1 2 3
Praying 0 1 2 3
Meditating 0 1 2 3
Fresh air 0 1 2 3
Confronting someone or something 0 1 2 3
Being accepted 0 1 2 3
Giving love 0 1 2 3
Boss pleased with your work 0 1 2 3
Being alone 0 1 2 3
Feeling safe 0 1 2 3
Working well with your fellow workers 0 1 2 3
Knowing your job is secure 0 1 2 3
Feeling safe in your neighborhood 0 1 2 3
Doing volunteer work 0 1 2 3
Contributing to a charity 0 1 2 3
Learning something 0 1 2 3
Being "one" with the world 0 1 2 3
Fixing/repairing something (besides at your job) 0 1 2 3
Making something (besides at your job) 0 1 2 3
Exercising 0 1 2 3
Meeting a challenge 0 1 2 3
Hugging and/or kissing 0 1 2 3
Flirting 0 1 2 3

Have we missed any of your uplifts? If so, write them in:
One more thing: Has there been a change in your life that affected how you answered this scale? If so, tell us what it was:
<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no particular reason why I exist.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>We are meant to make our own special contribution to the world.</td>
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<tr>
<td>I was meant to actualize my own potentials.</td>
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<tr>
<td>Life is inherently meaningful.</td>
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<tr>
<td>I will never have a spiritual bond with anyone.</td>
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<tr>
<td>When I look deep within my heart, I see a life I am compelled to pursue.</td>
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<td></td>
<td></td>
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<tr>
<td>My life is meaningful.</td>
<td></td>
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<tr>
<td>In performing certain tasks, I can feel something higher or transcendent working through me.</td>
<td></td>
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<tr>
<td>Our flawed and often horrific behavior indicates that there is little or no meaning inherent in our existence.</td>
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<tr>
<td>I find meaning even in my mistakes and sins.</td>
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<td></td>
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<tr>
<td>I see a special purpose for myself in this world.</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>There are certain activities, jobs, or services to which I feel called.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>There is no reason or meaning underlying human existence.</td>
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<td></td>
<td></td>
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<tr>
<td>We are all participating in something larger and greater than any of us.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX K

PRE-INTERVENTION QUESTION

Please indicate your response to the following items by circling the appropriate number for your response.

Based on your knowledge of the type of group you are assigned to, how beneficial do you expect your participation in the group to be?

1  – Not beneficial at all
2  – Somewhat beneficial
3  – Quite beneficial
4  – Very beneficial
APPENDIX L

DEMOGRAPHIC QUESTIONNAIRE

For the following questions, please circle or indicate the response which best describes you.

1. Age: _______ Years  
2. Sex (circle one): M  F

3. Ethnicity (circle one):  
   a) African-American  b) Asian-American  c) Caucasian  
   d) Indian  e) Latin American/Hispanic  f) Native American  g) Other _________

4. Religious preference (circle one):  
   a) Christian (denomination: _______________)  
   b) Buddhist  c) Hindu  d) Jewish  e) Non-denominational  f) Other _________  
   g) I do not have a religious preference  h) I am not religious/spiritual

5. I generally attend church services (circle one):  
   a) 7 days a week  b) 3-6 days a week  
   c) 2 days a week  d) 1 day a week  e) 2 days per month  f) 1 day per month  
   g) 6-12 days per year  h) 2-6 days per year  i) 1 day per year  j) never  
   k) Other ____________

6. How often do you pray? (circle one)  
   a) Hourly  b) Daily  c) Weekly  
   d) Monthly or more  e) Never

7. When I attend, I give money to a church (circle one):  
   a) Always  b) Routinely  
   c) Occasionally  d) Never

8. Over the course of a year, how much money do you give to a church?  
   $______________ average per year

9. Do you use any of the following techniques: meditation, rosary prayer, chanting, prayer beads)?  Yes ___  No ___
10. Do you practice yoga? Yes ____ No ____

If so, how often do you practice yoga? a) Daily  b) Weekly  c) Monthly  
d) Yearly  e) Almost Never

11. Are you currently receiving psychological services such as counseling?

Yes ____  No ____

12. On average, how many hours per week do you spend studying?

________ hours per week

13. How many credit hours are you taking this semester?

________ credit hours

14. How many hours do you work per week?

________ hours per week

15. Do you participate in any of the following recreational activities, either as an 
organized sports activity, or just for fun? Circle the ones you participate in, and 
indicate in the blank the amount of time you spend in each activity per week.

a) Aerobics ____  b) Bicycling ____  c) Running ____

d) Walking ____  e) Tennis ____  f) Swimming ____

g) Softball ____  h) Football ____  i) Basketball ____

j) Racquetball ____  k) Volleyball ____  l) Martial Arts ____

m) Baseball ____  n) Pilates ____  o) Kick-Boxing ____

p) Weightlifting ____  q) Other _____________________

16. Would you ever consider using nontraditional approaches to healing (alternative 
medicine)?  Yes ____  No ____

17. How many cigarettes do you smoke per day? ________
18. How many alcoholic beverages (e.g. one beer, one glass of wine, one mixed drink) do you consume per week? ________

19. If you elect to participate in this study, you may be asked to participate in moderate exercise. Do you have any medical condition which would prevent you from participating? Yes _____ No _____

20. Have you had surgery on your back, or do you have fused vertebrae? Yes _____ No _____

20. Are you currently pregnant, or are you planning pregnancy in the next two months? Yes _____ No _____

21. Do you wear a pacemaker? Yes _____ No _____

22. List below any current situations or experiences that you believe are causing you to feel stressed:
APPENDIX M

POST-INTERVENTION QUESTIONNAIRE

Please indicate your response to the following items by circling the appropriate number for your response.

1. Based on your group experience, how likable did you find your instructor?
   
   1 - Not likable
   2 - Somewhat likable
   3 - Quite likable
   4 - Very likable

2. How helpful do you think participating in the group was?
   
   1 - Not at all helpful
   2 - Somewhat helpful
   3 - Quite helpful
   4 - Very helpful

3. If this group were offered again, how likely would you be to recommend it to others?
   
   1 - Not at all likely
   2 - Somewhat likely
   3 - Quite likely
   4 - Very likely

4. How eager would you be to participate in a similar group if it were offered?
   
   1 - Not at all eager
   2 - Somewhat eager
   3 - Quite eager
   4 - Very eager

5. In the last 8 weeks (beginning with the first week you began participation in this study), have you engaged in any of the following activities beyond what was required as part of your group participation? Please circle the letter of those in which you have participated, then write the number of times you have participated in the activity in the blank (estimate to the best of your ability).
   
   a. Yoga
   b. Meditation
   c. Challenging thoughts
   d. Progressive muscle relaxation
   e. Psychological counseling

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6. Are you scheduled to graduate after this (fall) semester?
   1 – Yes  
   2 – No  

7. Are you currently on academic probation?
   1 – Yes  
   2 – No  

8. In what way, if any, has participation in this group changed your lifestyle habits?  
(Please feel free to use the remainder of this page to respond.)
APPENDIX N

KATRINA QUESTIONNAIRE

Please answer the following questions by circling the number that seems most correct to you:

Since Hurricane Katrina, I have been:

1 – Much less concerned about grades since Hurricane Katrina
2 – Less concerned about grades since Hurricane Katrina
3 – As concerned about grades as I was before Hurricane Katrina
4 – More concerned about grades since Hurricane Katrina
5 – Much more concerned about grades since Hurricane Katrina

Since Hurricane Katrina, I have attended classes:

1 – Much less often than I did before Hurricane Katrina
2 – Less often than I did before Hurricane Katrina
3 – As often as I did before Hurricane Katrina
4 – More often than I did before Hurricane Katrina
5 – Much more often than I did before Hurricane Katrina

Since Hurricane Katrina, I have thought of my grades as being:

1 – Much less important than before Hurricane Katrina
2 – Less important than before Hurricane Katrina
3 – As important as before Hurricane Katrina
4 – More important than before Hurricane Katrina
5 – Much more important than before Hurricane Katrina

My grades since Hurricane Katrina:

1 – Are much lower than they were before Hurricane Katrina
2 – Lower than they were before Hurricane Katrina
3 – The same as they were before Hurricane Katrina
4 – Higher than they were before Hurricane Katrina
5 – Much higher than they were before Hurricane Katrina

Since Hurricane Katrina, I attend church:

1 – Much less often than I did before Hurricane Katrina
2 – Less often than I did before Hurricane Katrina
3 – As often as I did before Hurricane Katrina
4 – More often than I did before Hurricane Katrina
5 – Much more often than I did before Hurricane Katrina
Since Hurricane Katrina, I pray or meditate:

1 – Much less often than I did before Hurricane Katrina
2 – Less often than I did before Hurricane Katrina
3 – As often as I did before Hurricane Katrina
4 – More often than I did before Hurricane Katrina
5 – Much more often than I did before Hurricane Katrina

Since Hurricane Katrina, I have:

1 – Not considered making any changes to my basic beliefs or activities
2 – Considered making changes to my basic beliefs or activities
3 – Made changes to my basic beliefs or activities

Since Hurricane Katrina, I have thoughts about God and meaning in life:

1 – Much less often than I did before Hurricane Katrina
2 – Less often than I did before Hurricane Katrina
3 – As often as I did before Hurricane Katrina
4 – More often than I did before Hurricane Katrina
5 – Much more often than I did before Hurricane Katrina

Were your living arrangements affected by Hurricane Katrina?

1 – No
2 – Yes

After Hurricane Katrina, I was without power and/or water for:

1 – I was not without power and/or water
2 – I was without power and/or water for a few hours
3 – I was without power and/or water for a few days
4 – I was without power and/or water for longer than one week

What type of damage did Hurricane Katrina cause to your primary residence?

1 – Does not apply to me
2 – I had no damage to my primary residence
3 – I had minimal damage to my primary residence
4 – I had severe damage to my primary residence
How long were you displaced by Hurricane Katrina?

1 - Does not apply to me
2 - I was displaced for a few days by Hurricane Katrina
3 - I was displaced for longer than one week by Hurricane Katrina
4 - I am still displaced by Hurricane Katrina

I have been asked to solicit volunteers for a campus-based hurricane relief organization that is just being formed. I have been told that they need people in every position, as they are just getting started, and that they can use people for just as much or as little time as they have to offer. My understanding is that, even if you have an hour to give them, they would be glad to have the help. Volunteering would not involve travel, and they say that they can work around your schedule. If you're interested in volunteering, please circle “Yes” or “No” below, and indicate whether I have permission to release your contact information to the people in charge.

1 - No, I am not interested in volunteering at this time
2 - Yes, I am interested in volunteering, and you may provide the organization with my contact information

Signature __________________________________
Print name ________________________________
Date ________________________________
1. Spit into the labeled tube. (If you have trouble producing saliva, chew sugarless gum.)
2. Be sure you have reached the fill line, marked on the side of the tube.
3. Carefully replace cap on tube, and place in cooler or fridge if possible.
4. Record actual time of collection in hours and minutes, below:

Drink as much water as you need, when you need it.

It is best to leave the tube by your bed when you go to sleep. As soon as you wake, before you get out of bed, and before you eat or drink anything, take the saliva sample. If you forget, and either rise or eat/drink before you collect the sample, please include that information with the time, above.

RESTRICTIONS:

NO CAFFEINE on day of testing
NO ALCOHOL the night before collection
NO FOOD OR DRINK for five minutes prior to sample
APPENDIX P

IY MEDITATION SCRIPT

Model appropriate posture, sitting on your mat, crossed legs, hands resting on your knees, as the class enters the room. They should follow suit.

"Let us begin. Cross your legs. It's okay if you can't put one over the other; do what's comfortable for you. We'll be holding this position for a few minutes. Be sure your chin is level, lengthening the throat to let as much air in as possible. Straighten your back and shoulders. Think of looking like a soldier at attention. Tail bone rooted firmly in the floor. Bring your hands to rest on your knees, palms up or down. If you know what a lock is (model), you can do that, too. Just do what feels most comfortable for you. Take a deep breath in, and as you exhale, allow your eyes to close, let your shoulders and back relax into this position.

Take another deep breath in, and let it out. Another deep breath in, and let it out. Take one more deep breath in, and let it a-a-a-l-l-l out. Just relax into this pose, allowing your mind to become still, allowing your breath to become deeper, more even, and more natural, until you find your own natural rhythm. (Let them breathe on own for about 30 seconds.)

Become aware of your breath. Notice how your belly expands and contracts as your breath deepens. Notice how your ribs feel as they expand and contract, how the air is cool on your in-breath and warm on the out-breath, cool on the in-breath and warm on the out-breath. (Pause.)

Become aware of the sounds in this room. Notice the sounds of others breathing around you, the sounds of the air conditioner, (use a couple of sounds that you notice). Become aware of everything your senses are bringing in. Notice the temperature of the room, how the air feels as it moves across your hair, the smell of the room, the way the light from the windows moves across your eyelids, how it's different than the light from the lights (engage your senses – notice a few things).

Become aware of your own body in this space. Become aware of your own breathing, how it’s slowed, how it’s becoming deeper, more even, more natural.

Throughout this exercise, and throughout this class, other thoughts will try to come into your head. This is just the mind doing what it’s supposed to do. Remember that anything that comes into your mind, urges to move, the urge to scratch, or thoughts about school and things outside of this class, they’re all just thoughts. We’re going to push those thoughts gently aside, without any judgment, they’re not wrong, they’re not right, they’re just thoughts. Push them gently aside, and know that you can come back to them later, that your mind will bring them back to you again, but for now, allow yourself to let them all go, and be relaxed in this space.
Bring your attention now to the very top of your head. Notice what you find there. Is it warm? Cool? Does noticing it make you want to scratch? Whatever you notice there, just notice it. We’re not going to change a thing, just let it be as it is, take it all in.

Move your attention down now to your forehead. Notice if there is any tension, any tightness all through your forehead. Whatever you notice, just make a note of it, don’t change it, don’t move it, just notice.

Bring your attention now to the rest of your face. Notice if there is any tension around your eyes, in your cheeks, in your lips, your mouth, even in your chin. And, remember, just notice. No judgment, no changing, just notice.

Keep moving your attention down to your neck, your throat. Notice if there is any tension there.

And, keep moving your attention into your shoulders, your biceps, your triceps, all the way into your fingertips. Notice if there is any tension, any tightness, and if your mind wants you to move or adjust, remember that that’s just a thought. Push it gently aside, and come right back to focusing on your body, noticing what’s there.

Bring your attention back up to your shoulders, and move into your upper back, your lower back. Into your chest and your belly. Notice any tension. Just observe it.

Keep moving your attention into your hips, your bottom, your thighs, into your knees, your calves, and, finally, all the way into your feet. Notice any tension, any tightness.

Now, bring your attention right back to the top of your head, and focus all your attention right there (Pause.) See all those spots of tension and tightness you just noticed all over your body. See them all at once, and just imagine that each of them is a tiny dot of bright, white light. See them glowing all your body, like strands of little lights. (Pause.) See them growing brighter and brighter and brighter, until your whole body is covered in bright, white light. We’re going to put out that light, using our breath. When I tell you to, we’ll take some deep breaths in, and we’ll use our breath to put out the lights until everything is dark and calm. So, now, take a deep breath in, and imagine that it’s going right to those lights, swirling around them, and, as you exhale, imagine that breath taking some of that light with it. See the lights dim just a bit. Take another deep breath in, letting it go right to the light that’s left, and, as you breathe out, let it take some more light with it. Take one last, deep breath in, and, as you exhale, let it take any light that’s left with it. See those lights fading all over your body, letting everything go black. (Pause.)

Allow your breathing to continue, deep and even and natural. Enjoy your body in this relaxed state, your mind still, calm, and peaceful. Just keep breathing these nice, deep, slow breaths as I introduce what we’ll be doing, today. (Read affirmation. Pause.)
Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one more deep breath in, and as you let it out, let your eyes flutter open. Wiggle your fingers, your toes, and bring the soles of your feet together for our stretching exercises.”
APPENDIX Q

IY CLASS 1 OUTLINE

"First of all, welcome to the class and to the study. You already know that you’ve been assigned to a yoga group, so let’s learn a little more about what you’re going to be doing.

First things first, it’s important that everything remain confidential. Everything that’s said and done in the group stays in the group. People have different reactions to things, and we want to be sure everyone feels safe in knowing that, if something happens that’s really personal, that not everyone will know about it. Another thing about confidentiality is that you’re in a specially designed group that may LOOK really similar to the other class, but let me assure you that they are indeed quite different. What we ask is that you keep the class content to yourself until the end of the study. After the study’s over, if you have a friend in the other group, and you want to compare notes about the things you did, you’re welcome to do so. Until then, though, the exercises we do, and the instructions we give you, have to remain our little secret. Any questions?

Okay, every class will follow the same basic plot. We’ll start with a meditation, so you’ll want to be sure you’re in the room on time. That will prevent others being distracted. Before you come in, be sure you sign the sheet outside the door. That’s how we’ll know that you were here, and that’s what we’ll use to assign credits on Experimetrix. While you’re out there, go ahead and take off your shoes, and turn off all cell phones, pagers, and anything else that can make noise. So, meditation to start the class, and then we’ll do some warm-up stretches, what we call a “flow” of poses, and then you will finish each class with a relaxation exercise. Once a week, we’ll ask you to do something that we learned in class while you’re at home. Twenty minutes of exercise, max.

Today, we’ll be going really slowly through the stretches and the flow to be sure everyone’s doing it right. You’ll notice that one of us in the black shirts and name tags will be going around the room to make adjustments. We’ll be adjusting you throughout every class to protect you and to help you do the exercises correctly so that you can get the most benefit. The one thing we ask is that you do your best, giving every class your best effort, and that you do your best to attend every session. If you happen to miss a class, you don’t really need to contact anyone. There will be reminder calls every week. If you miss a class, someone will call you to leave a reminder about your class meeting times.”

Go slowly through the stretching routine. Hold each stretch long enough that they get a good stretch (10 to 20 seconds each), and that any major adjustments can be made.

Go slowly through the sun salutation. Hold each pose long enough that adjustments can be made. Do the flow five times, with the last one being smooth and quick.

“We said that every class would end with a relaxation exercise, and we’re going to guide you through the first one, now. So, lie on your mat, on your back, letting your arms rest at
your sides with palms up, letting your feet and ankles relax. Once you’re there, let’s all take a deep breath in, and let it all out. Take another deep breath in, and let it out. And, take one last deep breath in, and let it a-a-a-a-l-l out, allowing your eyes to close. Just continue your nice, deep breaths, allowing your breath to become deeper, more even, until you fall into your own natural rhythm. We’re going to tense every muscle in your body on my cue. We’ll start with the soles of your feet, and we’ll work our way up your body until everything, every little muscle is tense, and, then, using our breath, we’ll let all that tension go at once, leaving our body completely relaxed.

Now, let’s begin by tensing your feet, curling your toes as tight as you can. Continue up to your ankles, tensing them as tight as you can. Hold that tension, and move it into your calves, tightening them as tight as you can. Holding all that tension, take it into your shins, your knees, your upper legs, your thighs, your bottom, until your whole lower body is tense. Now, let it get a little tighter. A little tighter.

Hold all that tension, and move it into your stomach, tightening your abs, take it into your lower back, your upper back, your chest. Take the tension down into your biceps, your triceps, forearms, and, finally, all the way into your hands, balling your hands into fists.

Hold all that tension, and take it now into your neck, your throat, and, finally, your face. Tense every muscle in your face as tight as you can, squinting as hard as you can.

And, now, make all the tension all over your body just a little tighter. A little tighter. And, now, so tight that your whole body just shakes. Take one de-e-e-ep breath in, and as you breathe out, let all that tension go.

Feel your body heavy on the mat, muscles completely relaxed. Focus only on your breathing, noticing the rise and fall of your stomach, feeling completely relaxed.

(Let them hold pose for at least one minute, depends on class time remaining. Watch the clock!)

Keeping your eyes closed, roll onto your left side, pulling your knees into your chest, and give yourself a hug, keeping your eyes closed and your breathing slow and deep.

(Hold for about 30 seconds.)

Keeping your eyes closed, let go of your legs, letting them relax. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and, as you let it out, allow your eyes to flutter open.

Take your time getting up. Don’t move too quickly. Be sure you wipe down your mat before you leave, and we’ll see you at the next class.

Namaste.”
APPENDIX R

IY CLASSES 2 AND 7 OUTLINE - AHIMSA

Meditation

Affirmation for the day: We affirm compassion and respect for all living beings, in thought, word, and deed. We will refrain from causing harm or pain to any being. We will rise above anger, hatred, jealousy, and resentment by practicing love and respect for all. We walk the path of selfless love, and know that, in love, there is no place for violence.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

- Tadasana/Mountain pose
- Arch back
- Dive forward to Uttanasana/Standing Forward Bend
- Lift to Urdhva Mukha Uttasana/Flat back
- Hands to the floor, jump or walk feet back to Plank
- Lower to Chaturanga Dandasana/Low push-up
- Lower to floor, and raise to Cobra
- Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
- Jump or walk feet forward to Standing Forward Bend
- Lift to Urdha Mukha Uttassana/Flat back
- Raise to Tadasana

Guided movement

“Come to the center of your mat, and assume prayer pose. As we got through our days, we’re faced with all sorts of demands, on our bodies, on our hearts, on our minds. We assume postures as the situation demands. Today, we look at the posture we assume when things do not go our way. Do we respond from a place of peace, showing our compassion and love for everyone around us, or do we respond with anger, resentment, and hostility? Today’s pose is Warrior, and we’ll do several forms of it. As you do each, ask yourself, “Which of these feels most familiar, most comfortable to my body?” Chances are, the type of warrior you are in this room is the type of warrior others see outside this space. Ask yourself, could you assume another posture? Can you be a peaceful warrior, even when demands are causing you to strain?”
Warrior II (arms extended)
Raise to Warrior I (arms above)
Peaceful Warrior
Warrior III (step into lunge, reaching forward, lift supporting leg, flat back)

Sivasana (Repeat affirmation)
APPENDIX S

IY CLASS 3 AND 8 OUTLINE - SAUCHA

Meditation

Affirmation for the day: We are committed to self-transformation and purity. In its pure state, our soul will be allowed to unfold into brilliant radiance. We live in order, releasing ourselves from attachments, and negative attitudes, feelings, and emotions. Our bodies and minds are clear reflections of God’s light.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

Tadasana/Mountain pose
Arch back
Dive forward to Uttanasana/Standing Forward Bend
Lift to Urdhva Mukha Uttasana/Flat back
Hands to the floor, jump or walk feet back to Plank
Lower to Chaturanga Dandasana/Low push-up
Lower to floor, and raise to Cobra
Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
Jump or walk feet forward to Standing Forward Bend
Lift to Urdha Mukha Uttassana/Flat back
Raise to Tadasana

Guided movement

“Today we will be practicing Saucha, which means to practice purity in thought, word, and deed. It also means to maintain cleanliness both within the body and without, practicing purity in body, mentality, and environment, and developing social relationships that are built upon a mutual respect for love and truth. Today, we will use the breath to focus on a path toward purity and growth, and to allow ourselves to be filled with life-giving energy. As we performs today’s poses and breathing exercise, let’s ask ourselves if these bodies are pure from within, and note how energized we feel when we show love and respect for ourselves, which we will also show to everyone around us.”
Warm-up for pranayama
Utrasana/Camel pose
Matsyasana/Fish pose
Alternate-nostril breathing (in for 4, hold for 4, out for 4)

Sivasana (Repeat affirmation)
APPENDIX T

IY CLASS 4, 9, & 12 OUTLINE - SATYA

Meditation

Affirmation for the day: We express truth in thought, word, and deed. We live in truth and love, and willingly share them with others. We see the divine within every person we meet, and in our honesty, allow love and goodwill to flow freely to everyone around us.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

Tadasana/Mountain pose
Arch back
Dive forward to Uttanasana/Standing Forward Bend
Lift to Urdhva Mukha Uttasana/Flat back
Hands to the floor, jump or walk feet back to Plank
Lower to Chaturanga Dandasana/Low push-up
Lower to floor, and raise to Cobra
Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
Jump or walk feet forward to Standing Forward Bend
Lift to Urdha Mukha Uttasana/Flat back
Raise to Tadasana

Guided movement

“Come to the center of your mat, and assume prayer pose. Today, we will practice satya, non-lying, or living in truth. Being dishonest, exaggerating, manipulating others for our own good – all these are against our essential good nature. In order to improve ourselves, we must first be honest within. Becoming honest with ourselves, we open the door to being honest and thoughtful with others. Today, we will experience living in truth. We will know peace of mind, and freedom from anxiety and worry. Be aware of your thoughts, and note whether they are self-serving. Allow yourself to be true to your innermost self, offering support and care for every person. Observe yourself, and be aware of what is, and let your thoughts and actions reflect the present moment.”
DO THIS IN PAIRS AFTER IT'S BEEN TAUGHT

Tadasana/Mountain pose
Vrksasana/Tree pose
Step into Warrior I, arms up
Move into Warrior III, arms stay in line, extend forward to
flat back, bottom leg lifts to level
Drop leg, fall back to Warrior I
Back to Mountain
Repeat other side

Sivasana (Repeat affirmation)
APPENDIX U

IY CLASS 5 & 10 OUTLINE - SANTOSHA

Meditation

Affirmation for the day: Whatever comes in life, we can accept, and will remain calmly centered within. We live in the present moment, and are open and receptive to the changes life may bring. The spirit of God is content and peaceful, and dwells within us. Because of this, we may know happiness and peace in any moment.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

- Tadasana/Mountain pose
- Arch back
- Dive forward to Uttanasana/Standing Forward Bend
- Lift to Urdhva Mukha Uttrassana/Flat back
- Hands to the floor, jump or walk feet back to Plank
- Lower to Chaturanga Dandasana/Low push-up
- Lower to floor, and raise to Cobra
- Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
- Jump or walk feet forward to Standing Forward Bend
- Lift to Urdha Mukha Uttrassana/Flat back
- Raise to Tadasana

Guided movement

“Come to the center of your mat, and assume prayer pose. Today, we’ll practice contentment, or acceptance of things as they are. We will live in the present moment, with no expectation or anticipation of the next moment. We will be free from longing, allowing our minds to become still, and we may become content, calm, and free from attachments. When this occurs, happiness and peace are allowed to flow constantly within. Today, we will allow ourselves to be content in the present moment. We will use our bodies to explore being pleased with the present, and free ourselves from desires that may prevent us from knowing peace. Accept what comes in this hour, even if we’re uncomfortable, not approving or disapproving. Let the hour unfold, and accept what comes, remaining calm, peaceful, and relaxed.”
Dhanurasana/Bow pose
Down to child pose
Ustrasana/Camel pose
Down to child pose
Out to Downward Facing Dog
Jump to hands – sit
Lie back, and up to Setu Bandhasana/Bridge pose
Lower to floor – hands behind – press to backbend
Lower to floor – bring soles of feet together
Let legs open to Supta Baddha Konasana – close eyes

Sivasana (Repeat affirmation)
APPENDIX V

IY CLASS 6 & 11 OUTLINE – AHIMSA

Meditation

Affirmation for the day: We affirm compassion and respect for all living beings, in thought, word, and deed. We will refrain from causing harm or pain to any being. We will rise above anger, hatred, jealousy, and resentment by practicing love and respect for all. We walk the path of selfless love, and know that, in love, there is no place for violence.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

- Tadasana/Mountain pose
- Arch back
- Dive forward to Uttanasana/Standing Forward Bend
- Lift to Urdhva Mukha Uttasana/Flat back
- Hands to the floor, jump or walk feet back to Plank
- Lower to Chaturanga Dandasana/Low push-up
- Lower to floor, and raise to Cobra
- Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
- Jump or walk feet forward to Standing Forward Bend
- Lift to Urdhva Mukha Uttassana/Flat back
- Raise to Tadasana

Guided movement

“Come to the center of your mat, and assume prayer pose.
Yoga teaches us that we’re all connected, that the Divine which dwells within me, dwells within you, within him, within her. We possess great reserves of hope, strength, and love, and we have the capacity to share those with others, when we practice compassion and respect for all beings, in thought, word, and deed. Today, we will honor one another, and honor our connection to all living beings. We all know someone in our past, who always seemed possessed of strength, who always seemed to offer support. They may be living or dead, but they are the person we think of, when we think of someone who always seems to have the inner strength to persevere any situation. Think about that person now. Think about your connection with them, and how that has affected you. We all know someone who seems to need our strength, or our shoulder to lean on. Think about that person now. Now, think about yourself, your strength, your own inner Divine and its
peace. Today, we honor our connections without and within ourselves, and we will practice being grateful for the strength, hope, and love in these connections. Let us be grateful for what we possess within ourselves, and let us be grateful that our bodies allow us to communicate strength, hope, love, and peace.”

Person I – person in past – see their strength reflected
Warrior II (arms extended)
Person II – person in need – allow them to see your peace
Warrior II (arms extended)
Person III – self – see own strength reflected
Warrior II (arms extended)
Person IV – see your partner – look into their eyes, and allow them to see hope and love, allow them to see the Divine which dwells within you both
Peaceful Warrior

Sivasana (Repeat affirmation)
APPENDIX W
YE MEDITATION SCRIPT

Model appropriate posture, sitting on your mat, crossed legs, hands resting on your knees, as the class enters the room. They should follow suit.

"Let us begin. Cross your legs. It’s okay if you can’t put one over the other; do what’s comfortable for you. We’ll be holding this position for a few minutes. Be sure your chin is level, lengthening the throat to let as much air in as possible. Straighten your back and shoulders. Think of looking like a soldier at attention. Tail bone rooted firmly in the floor. Bring your hands to rest on your knees, palms up or down. If you know what a lock is (model), you can do that, too. Just do what feels most comfortable for you. Take a deep breath in, and as you exhale, allow your eyes to close, let your shoulders and back relax into this position.

Take another deep breath in, and let it out. Another deep breath in, and let it out. Take one more deep breath in, and let it a-a-a-l-l-l out. Just relax into this pose, allowing your mind to become still, allowing your breath to become deeper, more even, and more natural, until you find your own natural rhythm. (Let them breathe on own for about 30 seconds.)

Become aware of your breath. Notice how your belly expands and contracts as your breath deepens. Notice how your ribs feel as they expand and contract, how the air is cool on your in-breath and warm on the out-breath, cool on the in-breath and warm on the out-breath. (Pause.)

Become aware of the sounds in this room. Notice the sounds of others breathing around you, the sounds of the air conditioner, (use a couple of sounds that you notice). Become aware of everything your senses are bringing in. Notice the temperature of the room, how the air feels as it moves across your hair, the smell of the room, the way the light from the windows moves across your eyelids, how it’s different than the light from the lights (engage your senses – notice a few things).

Become aware of your own body in this space. Become aware of your own breathing, how it’s slowed, how it’s becoming deeper, more even, more natural.

Throughout this exercise, and throughout this class, other thoughts will try to come into your head. This is just the mind doing what it’s supposed to do. Remember that anything that comes into your mind, urges to move, the urge to scratch, or thoughts about school and things outside of this class, they’re all just thoughts. We’re going to push those thoughts gently aside, without any judgment, they’re not wrong, they’re not right, they’re just thoughts. Push them gently aside, and know that you can come back to them later, that your mind will bring them back to you again, but for now, allow yourself to let them all go, and be relaxed in this space.
Bring your attention now to the very top of your head. Notice what you find there. Is it warm? Cool? Does noticing it make you want to scratch? Whatever you notice there, just notice it. We’re not going to change a thing, just let it be as it is, take it all in.

Move your attention down now to your forehead. Notice if there is any tension, any tightness all through your forehead. Whatever you notice, just make a note of it, don’t change it, don’t move it, just notice.

Bring your attention now to the rest of your face. Notice if there is any tension around your eyes, in your cheeks, in your lips, your mouth, even in your chin. And, remember, just notice. No judgment, no changing, just notice.

Keep moving your attention down to your neck, your throat. Notice if there is any tension there.

And, keep moving your attention into your shoulders, your biceps, your triceps, all the way into your fingertips. Notice if there is any tension, any tightness, and if your mind wants you to move or adjust, remember that that’s just a thought. Push it gently aside, and come right back to focusing on your body, noticing what’s there.

Bring your attention back up to your shoulders, and move into your upper back, your lower back. Into your chest and your belly. Notice any tension. Just observe it.

Keep moving your attention into your hips, your bottom, your thighs, into your knees, your calves, and, finally, all the way into your feet. Notice any tension, any tightness.

Now, bring your attention right back to the top of your head, and focus all your attention right there (Pause.) See all those spots of tension and tightness you just noticed all over your body. See them all at once, and just imagine that each of them is a tiny dot of bright, white light. See them glowing all your body, like strands of little lights. (Pause.) See them growing brighter and brighter and brighter, until your whole body is covered in bright, white light. We’re going to put out that light, using our breath. When I tell you to, we’ll take some deep breaths in, and we’ll use our breath to put out the lights until everything is dark and calm. So, now, take a deep breath in, and imagine that it’s going right to those lights, swirling around them, and, as you exhale, imagine that breath taking some of that light with it. See the lights dim just a bit. Take another deep breath in, letting it go right to the light that’s left, and, as you breathe out, let it take some more light with it. Take one last, deep breath in, and, as you exhale, let it take any light that’s left with it. See those lights fading all over your body, letting everything go black. (Pause.)

Allow your breathing to continue, deep and even and natural. Enjoy your body in this relaxed state, your mind still, calm, and peaceful. Just keep breathing these nice, deep, slow breaths as I introduce what we’ll be doing, today. (Read affirmation. Pause.)
Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one more deep breath in, and as you let it out, let your eyes flutter open. Wiggle your fingers, your toes, and bring the soles of your feet together for our stretching exercises.”
APPENDIX X

YE CLASS 1 OUTLINE

"First of all, welcome to the class and to the study. You already know that you've been assigned to a yoga group, so let's learn a little more about what you're going to be doing.

First things first, it's important that everything remain confidential. Everything that's said and done in the group stays in the group. People have different reactions to things, and we want to be sure everyone feels safe in knowing that, if something happens that's really personal, that not everyone will know about it. Another thing about confidentiality is that you're in a specially designed group that may LOOK really similar to the other class, but let me assure you that they are indeed quite different. What we ask is that you keep the class content to yourself until the end of the study. After the study's over, if you have a friend in the other group, and you want to compare notes about the things you did, you're welcome to do so. Until then, though, the exercises we do, and the instructions we give you, have to remain our little secret. Any questions?

Okay, every class will follow the same basic plot. We'll start with a meditation, so you'll want to be sure you're in the room on time. That will prevent others being distracted. Before you come in, be sure you sign the sheet outside the door. That's how we'll know that you were here, and that's what we'll use to assign credits on Experimetrix. While you're out there, go ahead and take off your shoes, and turn off all cell phones, pagers, and anything else that can make noise. So, meditation to start the class, and then we'll do some warm-up stretches, what we call a "flow" of poses, and then you will finish each class with a relaxation exercise. Once a week, we'll ask you to do something that we learned in class while you're at home. Twenty minutes of exercise, max.

Today, we'll be going really slowly through the stretches and the flow to be sure everyone's doing it right. You'll notice that one of us in the black shirts and name tags will be going around the room to make adjustments. We'll be adjusting you throughout every class to protect you and to help you do the exercises correctly so that you can get the most benefit. The one thing we ask is that you do your best, giving every class your best effort, and that you do your best to attend every session. If you happen to miss a class, you don't really need to contact anyone. There will be reminder calls every week. If you miss a class, someone will call you to leave a reminder about your class meeting times."

Go slowly through the stretching routine. Hold each stretch long enough that they get a good stretch (10 to 20 seconds each), and that any major adjustments can be made.

Go slowly through the sun salutation. Hold each pose long enough that adjustments can be made. Do the flow five times, with the last one being smooth and quick.

"We said that every class would end with a relaxation exercise, and we're going to guide you through the first one, now. So, lie on your mat, on your back, letting your arms rest at
your sides with palms up, letting your feet and ankles relax. Once you’re there, let’s all take a deep breath in, and let it all out. Take another deep breath in, and let it out. And, take one last deep breath in, and let it a-a-a-a-l-l out, allowing your eyes to close. Just continue your nice, deep breaths, allowing your breath to become deeper, more even, until you fall into your own natural rhythm. We’re going to tense every muscle in your body on my cue. We’ll start with the soles of your feet, and we’ll work our way up your body until everything, every little muscle is tense, and, then, using our breath, we’ll let all that tension go at once, leaving your body completely relaxed.

Now, let’s begin by tensing your feet, curling your toes as tight as you can. Continue up to your ankles, tensing them as tight as you can. Hold that tension, and move it into your calves, tightening them as tight as you can. Holding all that tension, take it into your shins, your knees, your upper legs, your thighs, your bottom, until your whole lower body is tense. Now, let it get a little tighter. A little tighter.

Hold all that tension, and move it into your stomach, tightening your abs, take it into your lower back, your upper back, your chest. Take the tension down into your biceps, your triceps, forearms, and, finally, all the way into your hands, balling your hands into fists.

Hold all that tension, and take it now into your neck, your throat, and, finally, your face. Tense every muscle in your face as tight as you can, squinting as hard as you can.

And, now, make all the tension all over your body just a little tighter. A little tighter. And, now, so tight that your whole body just shakes. Take one de-e-e-ep breath in, and as you breathe out, let all that tension go.

Feel your body heavy on the mat, muscles completely relaxed. Focus only on your breathing, noticing the rise and fall of your stomach, feeling completely relaxed.

(Let them hold pose for at least one minute, depends on class time remaining. Watch the clock!)

Keeping your eyes closed, roll onto your left side, pulling your knees into your chest, and give yourself a hug, keeping your eyes closed and your breathing slow and deep.

(Hold for about 30 seconds.)

Keeping your eyes closed, let go of your legs, letting them relax. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and, as you let it out, allow your eyes to flutter open.

Take your time getting up. Don’t move too quickly. Be sure you wipe down your mat before you leave, and we’ll see you at the next class.

Thank you.”
APPENDIX Y
YE CLASS 2 & 7 OUTLINE

Meditation

Affirmation for the day: We take this hour to take care of ourselves and our bodies. We will focus on our breath, calming our minds, and strengthening our bodies. Even now, our breathing is slowing, our heart is beating more slowly, and we are becoming quite relaxed. We will use this hour to take a little time out of our day, using our bodies to their potential.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

Tadasana/Mountain pose
Arch back
Dive forward to Uttanasana/Standing Forward Bend
Lift to Urdhva Mukha Uttasana/Flat back
Hands to the floor, jump or walk feet back to Plank
Lower to Chaturanga Dandasana/Low push-up
Lower to floor, and raise to Cobra
Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
Jump or walk feet forward to Standing Forward Bend
Lift to Urdha Mukha Uttassana/Flat back
Raise to Tadasana

Guided movement

“Come to the center of your mat, and bring your hands together at your sternum. Let’s take just a moment to enjoy being relaxed and calm before we begin today’s pose. Isn’t it nice to just take some time for yourself? Isn’t this something that your body appreciates? Today, we’ll be learning a new pose called Warrior, and we’ll do several forms of it. As you do each, notice how it’s working your lower body, especially through your quads and glutes. This pose will involve your upper body, too. Be sure you’re keeping tension in your arms, chest, and back, so that, if I were to try moving your arms, it would be difficult for me. Is everyone ready to begin?”
Warrior II (arms extended)
Raise to Warrior I (arms above)
Peaceful Warrior
Warrior III (step into lunge, reaching forward, lift supporting leg, flat back)

Sivasana (Repeat affirmation)
APPENDIX Z

YE CLASS 3 & 8 OUTLINE

Meditation

Affirmation for the day: We take this hour to take care of ourselves and our bodies. We will focus on our breath, calming our minds, and strengthening our bodies. Even now, our breathing is slowing, our heart is beating more slowly, and we are becoming quite relaxed. We will use this hour to take a little time out of our day, using our bodies to their potential.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

Tadasana/Mountain pose
Arch back
Dive forward to Uttanasana/Standing Forward Bend
Lift to Urdhva Mukha Uttasana/Flat back
Hands to the floor, jump or walk feet back to Plank
Lower to Chaturanga Dandasana/Low push-up
Lower to floor, and raise to Cobra
Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
Jump or walk feet forward to Standing Forward Bend
Lift to Urdha Mukha Uttassana/Flat back
Raise to Tadasana

Guided movement

“Come to the center of your mat, and bring your hands together at your sternum. Let’s take just a moment to enjoy being relaxed and calm before we begin today’s pose. Isn’t it nice to just take some time for yourself? Isn’t this something that your body appreciates? Today, we’ll be learning some new poses called camel and fish, and we’ll also learn a way of breathing that can reduce stress, called alternate nostril breathing. As we go through the poses, you’ll be working on your back, especially on strengthening, but also working on flexibility. The breathing exercise is something you can practice anytime, and you’ll probably find that it slows down and deepens your breath, and slows your heartrate.”
Warm-up for pranayama
Utrasana/Camel pose
Matsyasana/Fish pose
Alternate-nostril breathing (in for 4, hold for 4, out for 4)

Sivasana (Repeat affirmation)
APPENDIX AA
YE CLASS 4, 9, & 12 OUTLINE

Meditation

Affirmation for the day: We take this hour to take care of ourselves and our bodies. We will focus on our breath, calming our minds, and strengthening our bodies. Even now, our breathing is slowing, our heart is beating more slowly, and we are becoming quite relaxed. We will use this hour to take a little time out of our day, using our bodies to their potential.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

Tadasana/Mountain pose
Arch back
Dive forward to Uttanasana/Standing Forward Bend
Lift to Urdhva Mukha Uttasana/Flat back
Hands to the floor, jump or walk feet back to Plank
Lower to Chaturanga Dandasana/Low push-up
Lower to floor, and raise to Cobra
Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
Jump or walk feet forward to Standing Forward Bend
Lift to Urdha Mukha Uttassana/Flat back
Raise to Tadasana

Guided movement

“Come to the center of your mat, and bring your hands together at your sternum. Let’s take just a moment to enjoy being relaxed and calm before we begin today’s pose. Isn’t it nice to just take some time for yourself? Isn’t this something that your body appreciates? Today, we’ll be learning some new poses called Mountain and Tree, and we’ll keep using Warrior, which you learned in our last class. We’ll do this in pairs, because we’ll be working in balance, and you may want some extra support. These poses are going to work your lower body, really use your core muscles, too, to keep your upper body in correct alignment. Keep everything nice and tight, smooth and controlled.”
DO THIS IN PAIRS AFTER IT'S BEEN TAUGHT
Tadasana/Mountain pose
Vrksasana/Tree pose
Step into Warrior I, arms up
Move into Warrior III, arms stay in line, extend forward to
flat back, bottom leg lifts to level
Drop leg, fall back to Warrior I
Back to Mountain
Repeat other side

Sivasana (Repeat affirmation)
APPENDIX BB

YE CLASS 5 & 10 OUTLINE

Meditation

Affirmation for the day: We take this hour to take care of ourselves and our bodies. We will focus on our breath, calming our minds, and strengthening our bodies. Even now, our breathing is slowing, our heart is beating more slowly, and we are becoming quite relaxed. We will use this hour to take a little time out of our day, using our bodies to their potential.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

- Tadasana/Mountain pose
- Arch back
- Dive forward to Uttanasana/Standing Forward Bend
- Lift to Urdhva Mukha Uttasana/Flat back
- Hands to the floor, jump or walk feet back to Plank
- Lower to Chaturanga Dandasana/Low push-up
- Lower to floor, and raise to Cobra
- Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
- Jump or walk feet forward to Standing Forward Bend
- Lift to Urdha Mukha Uttassana/Flat back
- Raise to Tadasana

Guided movement

“Come to the center of your mat, and bring your hands together at your sternum. Let’s take just a moment to enjoy being relaxed and calm before we begin today’s pose. Isn’t it nice to just take some time for yourself? Isn’t this something that your body appreciates? Today, we’ll be learning a series of poses, or a flow. We’ll start in bow, then move into child pose, then camel, back to child pose, and then we’ll assume downward facing dog. We’ll do a jump forward, then lie back and do some work on our backs. It’s going to be complex and may be difficult, especially when we get to the backbend, but it’s going to work all your core muscle groups. We’ll be flexing and strengthening your back, your arms, and it’s going to open your hip flexors. It may really get your hearts pumping, too, but we’re going to end lying down, ready for our relaxation exercise. Let’s begin.”
Dhanurasana/Bow pose
Down to child pose
Ustrasana/Camel pose
Down to child pose
Out to Downward Facing Dog
Jump to hands – sit
Lie back, and up to Setu Bandhasana/Bridge pose
Lower to floor – hands behind – press to backbend
Lower to floor – bring soles of feet together
Let legs open to Supta Baddha Konasana – close eyes

Sivasana (Repeat affirmation)
APPENDIX CC

YE CLASS 6 & 11 OUTLINE

Meditation

Affirmation for the day: We take this hour to take care of ourselves and our bodies. We will focus on our breath, calming our minds, and strengthening our bodies. Even now, our breathing is slowing, our heart is beating more slowly, and we are becoming quite relaxed. We will use this hour to take a little time out of our day, using our bodies to their potential.

Stretching

Sun salutation - Repeat 5 times. Pause between each series. “Focus on a spot, straight ahead. Notice your breathing, your heartbeat, it’s probably increased a bit, beating harder in your chest. Take a deep breath in, and let it out. Take another deep breath in, and let it out. Take one last deep breath in, and let it all out. Notice that your breathing has slowed, that your heart is slowing down.”

- Tadasana/Mountain pose
- Arch back
- Dive forward to Uttanasana/Standing Forward Bend
- Lift to Urdhva Mukha Uttasana/Flat back
- Hands to the floor, jump or walk feet back to Plank
- Lower to Chaturanga Dandasana/Low push-up
- Lower to floor, and raise to Cobra
- Turn toes under, and raise to Adho Mukha Svanasana/Downward facing dog
- Jump or walk feet forward to Standing Forward Bend
- Lift to Urdha Mukha Uttassana/Flat back
- Raise to Tadasana

Guided movement

“Come to the center of your mat, and bring your hands together at your sternum. Let’s take just a moment to enjoy being relaxed and calm before we begin today’s pose. Isn’t it nice to just take some time for yourself? Isn’t this something that your body appreciates? Today, we’ll use the Warrior poses that you’ve already learned. The last class, we focused on your back and we worked your hips, too, so we’re going to give your back and inner thighs a break. Now, another thing we’ll do is work on our meditation skills that we’ve been using in the first part of our classes. So, what you’re going to do is pair up with someone. We’ll be using Warrior pose, but you’re going to do it facing someone, so that, while you’re working your body, you’re also working on your focus. You’ll be looking someone else right in the eye, and I want you to hold the pose as long as you can. You can change legs when you need to, but keep your gaze in the same place all the way
through the exercise. Treat it like a game, kind of like that game you played when you were little, and you wanted to see who would laugh first.”

Warrior II (arms extended) – 4 times, switching legs
Peaceful Warrior

Sivasana (Repeat affirmation)
APPENDIX DD

WALKING GROUP GENERAL FORMAT

1. Discussion and general lecture

2. Stretching (hold all stretched for 10-20 seconds)
   - Neck
   - Shoulder circles
   - Chest stretch
   - Chest pull
   - Side bends
   - Hamstring stretch
   - Calf stretch

3. Warm-up
   Walk for 5 minutes at a 1 or 2 PRE, should be able to talk

4. Walking in Zone for allotted time
   - If they start low PRE should be 3-6
   - If they start moderate PRE should be 4-9
   - If they start high PRE should be 6-10
   - They should be able to talk, but not sing.

5. Cool-down
   Walk for 5 minutes at a 1 or 2 PRE, should be able to talk

6. Cool-down stretches
   - Thigh
   - Alternate thigh
   - Inner thigh
   - Calf
APPENDIX EE

SCHEDULE OF DISCUSSIONS AND EVENTS FOR WALKING GROUP

Session 1:
Discussion
- Begin with description of group makeup and future group activities
- Obstacles: talk about other activities that can get in the way of walking
  - TV, videogames, snacking, etc.
- Assess what the group knows about fitness and exercise
- Assess what they know about walking in particular
Activity
  - 1-mile fitness test

Session 2:
Discussion
- Goal setting – how to set realistic/specific goals
  - Mention what makes goals quantifiable, how to set time limits
  - Distinguish between long and short-term goals
  - Conclude with discussion of the goal ladder
- Explain how to customize an individualized workout plan
- Explain the talk test and PRE
Activity
  - Walking
    - 5’ warm-up
    - 10’ Zone
    - 5’ cool-down

Session 3:
Discussion
- Finding the right shoes for walking
Activity
  - Walking
    - 5’ warm-up
    - 12’ Zone
    - 5’ cool-down

Session 4:
Discussion
- Hydration and appropriate apparel
Activity
  - Walking
    - 5’ warm-up
    - 14’ Zone
    - 5’ cool-down

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Session 5:
Discussion
Posture and alignment
Activity
Walking
5' warm-up
16' Zone
5' cool-down

Session 6:
Discussion
Breathing
Activity
Walking
5' warm-up
18' Zone
5' cool-down

Session 7:
Discussion
When and when not to walk
Activity
Walking
5' warm-up
20' Zone
5' cool-down

Session 8:
Discussion
Outdoor walking conditions and problems
Dogs, heat, traffic, uneven ground, night, safety
Activity
Walking
5' warm-up
22' Zone
5' cool-down

Session 9:
Discussion
Heat and hydration
Activity
Walking
5' warm-up
24' Zone
5' cool-down
Session 10:
Discussion
Advanced walking techniques
Activity
Walking
5' warm-up
26' Zone
5' cool-down

Session 11:
Discussion
Treadmill walking
Activity
Walking
5' warm-up
28' Zone
5' cool-down

Session 12:
Discussion
Answer any questions they might have about continuing the program
What to do with their individualized program next
Activity
Walking
5' warm-up
30' Zone
5' cool-down
Goodbyes and Thank you


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