

**ASSESSING THE IMPACT OF A SIX WEEK, YOGA BASED
PRACTICE OF BODY AWARENESS AND INTENTIONAL
RELAXATION ON AFFECT AND PERCEIVED STRESS IN
ADOLESCENT GIRLS**

Nancy L. Bloemer

Dissertation
submitted to the Faculty of
Holos University Graduate Seminary
in partial fulfillment of the requirements
for the degree of

DOCTOR OF THEOLOGY

Copyright by Nancy L. Bloemer, 2007

All Rights Reserved

The work reported in this thesis is original and carried out by me solely, except for the acknowledged direction and assistance gratefully received from colleagues and mentors.

[full name]

ACKNOWLEDGEMENTS

Thank you first and foremost to the voice of the Creator within me that guided me through every step of this journey, even while I resisted.

Thank you to my brother, Bill Bloemer, Ph. D., who years ago set the bar for my educational pursuits. Thank you to my parents, Barbara Mersch and Bernard Bloemer, who instilled a passion for learning in my very being.

Thank you to my husband and dear partner in life, Frank M. Biro, M. D., who guided and supported me without fail through the darkest and brightest of hours of this educational pursuit. My life is blessed beyond measure with his companionship and love. Thank you to my husband's colleagues in the field of adolescent medicine who both informed and inspired me.

Thank you to the wonderful young women I met in doing the present research. My heart is lifted with the promise of the future held in these bright and energetic young souls. Thank you to Sister Elaine Winter who supported this work without question, even to the point of defending it on my behalf. Thank you to Ms. Andrea Wiederhold who is truly an inspiration to me. I have rarely witnessed such faith and passion in the work of one person.

A sincere thank you, wrapped tightly in an even more sincere and overdue apology, is offered to my family, friends, fellow yoga students, clients and business colleagues. Thank you for your support. And I am truly sorry for the time and energy that was diverted and unavailable to you all throughout this process.

I am eternally grateful for all of the angels and guides (seen and unseen) who miraculously appeared at critical moments to direct, support, nurture, encourage and, at times, correct my course throughout this journey.

Thank you for the courage and foresight of the faculty and staff (past and present) at Holos University Graduate Seminary in establishing, expanding and maintaining the infrastructure for this incredible journey of growth and wonderment.

Thank you to my cheerleader and committee chair, Carolyn Faivre, M.S., Ph. D. I am at once grateful for and humbled by the commitment, expertise and dedication of my entire dissertation committee: Dr. Carolyn Faivre; Karin Cremasco, Ph. D., Th. D., CCI; David Eichler, M.A., Ph. D.; and Mei-fei Elrick, Ph. D. Thank you all for your patience and compassion.

ABSTRACT

Adolescents, particularly females, undergo physical and emotional challenges many of which impact their short and long term health. Self care practices such as yoga have been documented as helpful in coping with stressful circumstances; however few studies have addressed specifically their effectiveness in a population of adolescent girls. The purpose of this study was to assess the impact of a weekly yoga based practice of body awareness and intentional relaxation on self rated affect and perceived stress levels in adolescent girls. The intervention group ($n = 47$) participated in six 50 minute, yoga based sessions over a seven week period. Dependent variable scores were compared to a control group ($n = 40$) over the same time frame. Both groups completed the Positive and Negative Affect Schedule (PANAS) and the Perceived Stress Scale (PSS) one week prior to and one week after the intervention sessions. The perceived stress scores of the adolescent girls who practiced the yoga based practice decreased significantly over time as compared to the control group. Positive affect scores improved over time in the intervention group but only in those adolescent girls who participated in five or more sessions. Negative affect scores did not change significantly over time in either the control or intervention groups. Discussion of possible explanations for the changes observed and implications for future research are included.

Key words: yoga, relaxation techniques, meditation, breathing exercises, relaxation response, mindfulness practices, body awareness, affect, Positive and Negative Affect Schedule, PANAS, adolescent girls, mood, Perceived Stress Scale

TABLE OF CONTENTS

Section	Page Number
ACKNOWLEDGEMENTS.....	iv
ABSTRACT.....	vi
TABLE OF CONTENTS.....	vii
LIST OF FIGURES	x
LIST OF TABLES.....	xi
CHAPTER 1: STATEMENT OF RESEACH	1
Introduction.....	1
Background of the Problem	2
Purpose of the Study	4
Research Questions.....	4
Research Hypotheses	5
Research Hypothesis.....	5
The Null Hypothesis	5
Scope of the Study	6
Definition of Terms.....	7
Significance of the Study.....	9
CHAPTER 2: REVIEW OF LITERATURE.....	14
Introduction.....	14
Stress and Health.....	14
Emotions and Health.....	18
Pathways of Impact.....	23
Physiological Model	23
Behavioral Model.....	24
Challenges of Adolescence for Young Women.....	26
Yoga and Health	30
Hypotheses Rationale.....	33
Summary	36
CHAPTER 3: RESEARCH METHODOLOGY	41
Introduction.....	41
Research Design.....	42
Research Timetable.....	43
Research Population.....	44
Intervention Group.....	44
Control Group.....	46
Potential Risks for the Research Population.....	47
Discontinuation Option for Research Participants.....	47
Institutional Review Board	48
Dependent Variable Measures	48
Positive and Negative Affect Schedule (PANAS).....	48
Perceived Stress Scale (PSS)	49
Independent Variable	50
Intervention Objectives.....	50

Session Format.....	51
Session Content.....	52
Physical Setting.....	53
Session Recordings.....	53
The Intervention as School Curriculum and Option for Non-Participation.....	54
Role of the Primary Investigator/Intervention Facilitator.....	55
Experimenter Bias.....	55
Procedures.....	56
Intervention Group Procedures.....	56
Control Group Procedures.....	59
Procedural Documentation.....	60
CHAPTER 4: RESEARCH FINDINGS.....	62
Data Collection.....	62
Statistical Analysis.....	63
Statement of the Null and Research Hypotheses.....	63
Alpha Value.....	63
Statistical Test.....	63
Obtained Values.....	64
Perceived Stress Scale (PSS).....	64
Positive Affect (PA).....	65
Negative Affect (NA).....	67
Additional Data Analyses.....	68
Perceived Stress Scale (PSS).....	69
Positive Affect (PA).....	70
Negative Affect (NA).....	72
Summary.....	73
CHAPTER 5:.....	75
DISCUSSION.....	75
Introduction.....	75
Summary of Results.....	75
Discussion of the Results.....	76
Perceived Stress Scale.....	76
Positive and Negative Affect Scale.....	77
Implications within Current Research Models.....	84
Physiological Model.....	84
Behavioral Model.....	85
Affective Personality Model.....	87
Research Limitations.....	88
Design and Internal Validity.....	88
External Validity.....	91
Measurement and Statistical Analysis.....	91
Suggestions for Future Research.....	92
Summary.....	95
REFERENCES and BIBLIOGRAPHY.....	99
APPENDIX A : Statement of Belief.....	116
APPENDIX B : Philosophy of the Intervention.....	119

APPENDIX C : Conceptual Model for Intervention	129
APPENDIX D : Consent and Assent Forms	133
APPENDIX E : Presentation to the Intervention Group.....	145
APPENDIX F : Newsletter Article	147
APPENDIX G : Dependent Variable Measures	148
APPENDIX H : Intervention Sessions	153
APPENDIX I : Sample Relaxation Techniques.....	163

LIST OF FIGURES

Figure	Page Number
Figure 1: Perceived Stress Scale Means	65
Figure 2: Positive Affect Means	66
Figure 3: Negative Affect Means.....	68
Figure 4: Perceived Stress Scale Means with Absence Filter.....	70
Figure 5: Positive Affect Means with Absence Filter.....	71
Figure 6: Negative Affect Means with Absence Filter	73

LIST OF TABLES

Table	Page Number
Table 1: Emotions and Health.....	18
Table 2: Behavioral Model	25
Table 3: Intervention Group Eligibility	45
Table 4: Mean Scores for Perceived Stress Scale.....	64
Table 5: Mean Scores for Positive Affect.....	66
Table 6: Mean Scores for Negative Affect	67
Table 7: Mean Scores for Perceived Stress Scale with Absence Filter	69
Table 8: Mean Scores for Positive Affect with Absence Filter	71
Table 9: Mean Scores for Negative Affect with Absence Filter.....	72
Table 10: Behavioral Model	85
Table 11: Behavioral and Physiological Models	86
Table 12: Affective Personalities.....	87
Table 13: Mean Scores for Total Intervention Group and Absence Filter Group	94

CHAPTER 1: STATEMENT OF RESEACH

Introduction

Ample scientific evidence supports what many have come to understand through experience about the challenges and opportunities of adolescence. Research clearly highlights adolescence as a vulnerable period with lifelong health implications,¹ particularly for young women.² With reported utilization of self care measures such as yoga and meditation on the rise,³ research into the efficacy and effectiveness of these techniques in the adolescent population is not only timely but significant. What self care tools can be confidently offered to adolescent girls to assist them in cultivating physical, mental, emotional and spiritual health during their transition from childhood to adulthood? This text reports research exploring the effectiveness of one approach to self care. The present research investigated the impact of a six week, yoga based program of body awareness and intentional relaxation on self rated scores of perceived stress and affect in a group of adolescent girls. The purpose of the present text is to explain the formation of the research, to clarify its methodology and results, and to assess the practical and scientific implications of the study.

The first chapter introduces the study via a brief historical perspective of the concepts integral to the study and overview of the research questions which prompted the design of this investigation. Chapter Two complements chapter one through a review of the literature specific to the topics involved in the present research, namely the health implications of adolescence as they apply to young women, the impact of stress and affect (emotion) on health, and the effectiveness of self care practices similar to the one

proposed in the present research. Specific research methodology utilized in the present research will be detailed in Chapter Three and its accompanying appendices. Chapter Four will specify results of the statistical analyses applied to the data collected in the study. The final chapter of this text will discuss this study's implications for future scientific inquiry and for practical application. The study's limitations will also be addressed in the Chapter Five. The appendices of this document contain copies of documents and procedures utilized in the study. Also in appendix form ([Appendix A](#)) is a "statement of belief" issued by the study's primary investigator (PI) as a step toward complete disclosure of research biases.

Background of the Problem

Research has shown that when faced with a threat to current homeostasis or balance, the body responds with a cascade of physiological changes that enable the body to either fight or flee the stressful situation.⁴ A distinction is made in the literature between good stress (eustress) and bad stress (distress). "While the mind is aware of the difference, the body is not and will experience wear and tear in any case."⁵ The initial physiological, behavioral and cognitive responses to physical or emotional stress have been found to be for the most part health enhancing and in many cases necessary for survival. Illness and disease, however, can also be a byproduct of the body's stress response. This occurs primarily in one of two pathways. Illness can occur when the response to stress is either insufficient (hypo) or inappropriate (hyper) to address the present threat; or when the body cannot regulate the response and return to homeostasis once the stress response has been activated. In either case the stress response which originally preserves health transforms into a health depleting mechanism associated in the

research literature with a vast array of disease processes including cardiovascular disease, immune disorders, cancer and mental illness.⁶ One factor important in triggering the physiological response to a particular circumstance is the subjective perspective of the stressor. Subjective ratings of stressful events have been shown in the literature as a better way to assess health outcomes than simply tallying the number of stressful events in one's life.⁷

Research has found that emotions are potential stressors to the body equal to the physical stressors of everyday living in their capacity for health enhancement or health depletion.⁸ Acting through much the same physiological mechanisms of the stress response, emotions have been shown both to enhance health and to promote disease processes.⁹

Practices such as yoga, meditation, and intentional relaxation have emerged both in popular culture and in the scientific literature as promising self care measures to temper the physiological responses to physical and emotional stress that can lead to disease and discomfort. Evidence, detailed in the following literature review chapter, is mounting regarding the health enhancing impact of a wide array of these types of practices.¹⁰ The present research adds to the growing body of evidence regarding these types of self care practices through an investigation into the impact of a yoga based practice of body awareness and intentional relaxation on adolescent girls.

Adolescence is a particularly stressful and emotional period of transition in life. How the physical, mental, emotional and social demands of this time of rapid transition are met influence health and wellbeing for years to come.¹¹ Previous studies have revealed that young women fall prey to negative health outcomes of adolescence far more

often than their male counterparts.¹² While a plethora of research explores the potential health hazards of adolescence peculiar to young women, precious little is revealed in the literature about the effectiveness of self care measures, such as yoga and meditation, for this particular population.

Purpose of the Study

The present study investigated the impact of a six week, yoga based practice of body awareness and intentional relaxation on self rated perceived stress and affect (or emotional state) in adolescent girls. (Terms integral to the present study are defined later in this chapter.) As will be discussed in the following literature review chapter, a great deal is known now about the relationships among emotions, perceived stress and health. Less, however, is understood about the specific mechanisms of impact and about techniques for influencing those pathways. What the present research adds to the current body of evidence is a scientific assessment of a self care measure that may offer a way to mediate the influence of emotions and perceived stress on health. From a practical perspective, the purpose of the present research was to ascertain the effectiveness of the intervention in the lives of adolescent girls. In short, is the intervention beneficial for young women during the physically and emotionally stressful transition of adolescence?

Research Questions

The impetus of the current study was drawn from research comparing 90 minute interventions of yoga, African dance and a biology lecture within a group of college students.¹³ In this study, participants selected one of the three intervention sessions. Self assessment measures of affect (specifically, emotional states) and perceived stress were taken before and after each one time session. The study found that negative affect and

perceived stress scores significantly declined in those who participated in the yoga and African dance sessions. Positive affect scores, however, improved only in those who participated in the African dance session. The study suggests that yoga could be a valuable tool for impacting affect and perceived stress, but what about its applicability to adolescent girls? In light of other research (reviewed in Chapter Two) regarding the impact of affect and perceived stress on health, could these promising results involving affect and perceived stress be replicated in a younger, female population? Are the results found in this study lasting? In other words, would a practice of more than one session in duration render different results regarding affect and perceived stress? And finally, how would measures of affect and perceived stress be impacted if participation in the intervention were not based on self selection?

Research Hypotheses

With these questions in mind, the present research was designed to investigate the following hypotheses:

Research Hypothesis

Self rated measures of perceived stress as well as positive and negative affect will change significantly in the intervention group of adolescent girls after participation in a six week, yoga based practice of body awareness and intentional relaxation as compared to a control group of adolescent girls.

The Null Hypothesis

Self rated measures of perceived stress as well as positive and negative affect will not change significantly in the intervention group after participation in a six week, yoga

based practice of body awareness and intentional relaxation as compared to a control group of adolescent girls.

Scope of the Study

The intervention in this study developed from the approach to self care practiced and taught professionally for over 20 years by the study's primary investigator (PI).¹⁴ It is an eclectic approach to practical self care drawing from hatha yoga, medical massage therapy theory and practice, relaxation techniques, a variety of meditation, guided imagery and visualization practices, Hawaiian shamanism and various other mystical philosophies. While ample anecdotal evidence can be drawn from the PI's professional experience of both teaching and practicing this approach, the present research represents the first time it was applied to the rigors of scientific investigation.

The intervention in this research included yoga based breathing exercises, gentle stretches and intentional relaxation techniques. While the format for each session was consistent (as described in the methodology chapter), the specific contents of the sessions were intentionally flexible enough to allow for the uniqueness of each circumstance. It is important to clarify that the intervention of the study was the specified time taken to practice mindfulness through body awareness and to experience the relaxation response through intentional relaxation. Thus, the study was not designed to establish the effectiveness of a specified regimen. The scope of the research was to ascertain the impact of taking the time to practice these types of techniques on affect and perceived stress in adolescent girls.

Definition of Terms

Yoga Based: What is typically practiced in and understood as “yoga” in America is a form of yoga called hatha yoga. The various disciplines of yoga familiar to many Americans such as Anusara, Ashtanga (sometimes called Power Yoga), Bikram (also referred to as Hot Yoga), Integral, and Iyengar are all variations on the same themes of hatha yoga which include physical exercise (asanas or postures), breathing practices (pranayama), and various forms of meditative relaxation.

In the system of hatha yoga, the asanas are non-strenuous stretches that increase flexibility and tone and strengthen the musculature, stabilize and balance the nervous system and promote circulation in all major organs and glands. The practices also help to promote psychological equanimity. The regular performance of the combined hatha yoga postures and practices has been clinically observed by medical practitioners throughout the world to enhance overall health and both prevent and reverse disease.¹⁵

The breathing exercises, gentle stretches and relaxation practices for the intervention proposed in the present study were based in hatha yoga. The research hypothesis for the present study was not concerned with demonstrating the effectiveness of “hatha yoga” per se. Mastery of specific yoga postures or philosophical perspectives was not the focus of the six week intervention. The purpose of this research was to investigate the impact of a regular practice based in hatha yoga of body awareness and intentional relaxation on the affect and perceived stress levels of adolescent girls – a “person centered” (rather than regimen focused) practice flexible enough to integrate a wide array of self care techniques. Techniques utilized in the intervention sessions while based in hatha yoga practices, were not limited to them. The six yoga based sessions focused solely on physical and mental relaxation in a non-judgmental atmosphere of self awareness. The philosophical, cultural and historical perspectives associated with

practice of hatha yoga were not presented, discussed or implied at any time during the sessions.

Body Awareness: Within the context of this research, body awareness was defined as an intentional, non-judgmental awareness of the body in movement and in stillness through yoga based stretches and postures (asanas). The intention of this aspect of the intervention was to practice techniques for being present without goals, objectives, criticism or judgment. This aspect of the intervention most closely aligns with what is termed “mindfulness” in research literature. Mindfulness includes a wide variety of techniques, such as meditation, yoga, and walking, designed to “enhance the ability to remain immersed nonjudgmentally in the present moment.”¹⁶ The present research intervention encouraged mindfulness as it is described in the literature by using awareness of the body as a mental focal point. The intervention in the present study was not concerned with a list of specific techniques to be repeated with the goal of obtaining some level of physical or mental mastery. Rather, the intervention encouraged mindfulness via a moment by moment, non-critical awareness of the body in present time consciousness. The intervention offered an experiential introduction to a variety of techniques for body awareness through yoga based postures (asanas) and movements. Study participants were encouraged to participate only to the degree that was intuitively appropriate for them at each moment.

Intentional Relaxation: As defined in this study, intentional relaxation was the purposeful and conscious practice of relaxing the body and mind. Relaxation can be commonly associated with the states experienced in sleep; in “zoning out” while watching television, a movie or video game; or in alcohol or drug induced altered states.

As an alternative to these types of experiences associated with relaxation, the intervention in this study introduced the concept and practice of intentional relaxation whereby the body and mind release tension while remaining mentally alert and physically aware. The concept of intentional relaxation as it applied to the present research most closely aligns with what is termed “the relaxation response” in scientific literature. Employing the four basic components necessary to elicit the relaxation response (a quiet place, a mental focus, a passive attitude and a comfortable position¹⁷), the research intervention fostered the “physical state of deep rest that changes the physical and emotional responses to stress.”¹⁸ Various techniques (discussed in Chapter Three) were explored during the intervention sessions for practicing intentional relaxation.

Affect: Within the context of this text, affect is used as synonymous with emotion. Specifically what were measured in the present study were affective or emotional states as experienced by the adolescent girls “in the past week” and self rated on a five point scale, called the Positive and Negative Affect Schedule (PANAS).¹⁹

Perceived Stress Levels: This term refers to a numeric score obtained when the research participants completed a self rated measurement tool designed to assess the degree to which their lives were perceived as “unpredictable, uncontrollable and overloading.”²⁰ The scale utilized to assess perceived stress was the Perceived Stress Scale (PSS).

Significance of the Study

Yoga and yoga based practices such as meditation have exploded into popular American culture in recent years. “Twenty million people now practice yoga nationwide.”²¹ With the growing popularity and practice, it is critical, now more than

ever, to understand whether or not self care measures such as the yoga are indeed beneficial; and if so, why and how they influence health; as well as when and how they might be optimally utilized. The importance of the present research is in its addition to the accumulating information available on the effectiveness and the efficacy of methods and measures practiced by individuals in the name of personal health promotion. Alone, the present research offers little to those interesting in understanding health and wellbeing, but combined with other research findings in the field, it becomes another piece in the puzzle of understanding overall health.

Another valuable aspect of the present intervention rests in its clear distinction as a “yoga based” practice (as described above) rather the practice of yoga. The distinction might appear irrelevant but indeed may impact the applicability of the research findings into general practice. Regardless of the mounting scientific evidence involving the health benefits of yoga and meditation, many people resist involvement in these self care measures because of perceived conflicts with personal, religious or cultural perspectives. Passing over the philosophical, cultural and historical implications of yoga, the present research intervention focuses solely on techniques derived from the practice of hatha yoga that encourage “mindfulness” as well as the “relaxation response,” both of which are scientifically validated as health enhancing measures.²² The intervention then translates to a palatable application of self care grounded in scientific evidence rather than a recommendation for acceptance of a particular philosophic perspective.

The majority of research into mindfulness revolves around the techniques and methods developed and researched by Jon Kabat-Zinn called Mindfulness Based Stress Reduction (MBSR) or sometimes called Mindfulness Meditation. While MBSR has been

shown time and again to be a powerful aid in personal health and wellbeing,²³ the importance of the present research study is in its distinction from the MBSR technique. The MBSR training involves a commitment to attend a 2.5 to 3 hour class per week over eight weeks, a silent seven hour retreat midway through the training, and a commitment to practice the techniques one hour per day, six days per week.²⁴ The present research was designed to investigate the impact of a much more modest investment of time and energy than what is typically required in the MBSR approach.

Another arena where the present research anticipated making a contribution to the scientific literature was within the field of adolescent medicine. As will be explored in the next chapter, there is ample evidence for the short and long term health implications of adolescence, particularly for young women. What is missing from the research is evidence for health enhancing self care measures that adolescent girls can utilize not only during the teen years but throughout their lives. The importance and ultimate goal of the present research lies in its practical application for enhancing the lives of young women.

Chapter 1 Endnotes:

-
- ¹ Diane Von Ah, Sheryl Ebert, Anchalee Ngamvitroj, Najin Park, and Duck-Hee Kang, "Predictors of Health Behaviours in College Students." *Journal of Advanced Nursing* 48, no. 5 (2004): 472.
- ² American Psychological Association, <http://www.apa.org/pi/cfy/adolesgirls.html>
- ³ Patricia Barnes, Eve Powell-Griner, Kim McFann, and Richard Nihin, "Complementary and Alternative Medicine Use among Adults: United States, 2002." *CDC Advance Data Report* #343 (May 27, 2004), Hyattsville, MD: Center for Health Statistics.
- ⁴ George P. Chrousos and Phillip W. Gold, "The Concepts of Stress and Stress System Disorders: Overview of physical and behavioral homeostasis." *Journal of the American Medical Association* 267, no. 9 (March 4, 1992): 1244 – 1252; George Manning, Kent Curtis, and Steve McMillan, *Stress: Living and Working in a Changing World* (Duluth, MN: Whole Person Associates, 1999), 2 – 30.
- ⁵ Manning, Curtis and McMillan, 25.
- ⁶ Chrousos and Gold , 1244 – 1252.
- ⁷ Sheldon Cohen, Tom Kamarck, and Robin Mermelstein, "A Global Measure of Perceived Stress." *Journal of Health and Social Behavior* 24 (December 1983): 386.
- ⁸ Chrousos and Gold , 1245; Margaret A. Chesney, Lynae A. Darbes, Kate Hoerster, Jonelle M. Taylor, Donald B. Chambers, and David E. Anderson, "Positive Emotions: Exploring the Other Hemisphere in Behavioral Medicine." *International Journal of Behavioral Medicine* 12, no. 2 (2005): 50 – 58; Richard J. Davidson, "Affective Style and Affective Disorders: Perspectives from Affective Neuroscience." *Cognition and Emotion* 12, no. 3 (1998): 307 – 330; Janice K. Kiecolt-Glaser, Lynanne McGuire, Theodore F. Tobles, and Ronald Glaser, "Emotions, Morbidity, and Mortality: New Perspectives from Psychoneuroimmunology." *Annual Reviews of Psychology* 53 (2002): 87 – 88.
- ⁹ Tracy J. Mayne, "Negative Affect and Health: The Importance of Being Earnest." *Cognition and Emotion* 13, no. 5 (1999): 602.
- ¹⁰ International Association of Yoga Therapists, www.iayt.org; Karen Pilkington, Graham Kirkwood, Hagen Rampes, and Janet Richardson, "Yoga for Depression: The Research Evidence." *Journal of Affective Disorders* 89 (2005): 13 – 24; Erica Sandlund and Torsten Norlander, "The Effects of Tai Chi Chuan Relaxation and Exercise on Stress Responses and Well-Being: An Overview of the Research." *International Journal of Stress Management* 7, no. 2 (2000): 139 – 149; Melbourne Academic Mindfulness Interest Group, "Mindfulness-based Psychotherapies: A review of conceptual foundations, empirical evidence and practical considerations." *Australian and New Zealand Journal of Psychiatry* 40 (2006): 285 – 294.
- ¹¹ Von Ah, et al, 472.
- ¹² American Psychological Association, <http://www.apa.org/pi/cfy/adolesgirls.html>
- ¹³ Jeremy West, Christian Otte, Kathleen Geher, Joe Johnson and David D. Mohr, "Effects of Hatha Yoga and African Dance on Perceived Stress, Affect and Salivary Cortisol." *Annals of Behavioral Medicine* 28, no. 2 (2004): 114 – 118.
- ¹⁴ Nancy Bloemer, *The Now River: Practical Techniques for Living in the Present Moment* (Covington, KY: Now River Publications, 2003).
- ¹⁵ Nirmala Herzia, *Dr. Yoga: A complete program for discovering the head-to-toe health benefits of yoga.* (New York: Jeremy P. Tarcher/Penguin, 2004) xxxii
- ¹⁶ Nancy Hamilton, Heather Kitzman and Stephanie Guyotte, "Enhancing Health and Emotion: Mindfulness as a Missing Link between Cognitive Therapy and Positive Psychology." *Journal of Cognitive Psychotherapy: An International Quarterly* 20, no. 2 (2006): 124.
- ¹⁷ John H. Gohde, "A History of the Mind Body Connection." The Natural Health Perspective, <http://naturalhealthperspective.com/tutorials/history-min-body-connection.html>.
- ¹⁸ Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital, http://www.mbni.org/basics/whatis_rresponse_TRR.asp.
- ¹⁹ David Watson and Lee Anna Clark. "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scale." *Journal of Personality and Social Psychology* 54, no. 6 (1988): 1063 – 1070.
- ²⁰ Cohen, Kamarck, and Mermelstein, 387.

²¹ Carrie Schneider, *American Yoga: The Paths and Practices of America's Greatest Yoga Masters*. (New York: Barnes and Noble Books, 2003), 8.

²² Benson-Henry Institute, www.mbmi.org; Melbourne Academic Mindfulness Interest Group, 285 – 294.

²³ Melbourne Academic Mindfulness Interest Group, 285 – 294.

²⁴ Richard Davidson, Jon Kabat-Zinn, Jessica Schumacher, Melissa Rosenkranz, Daniel Muller, Saki Santorelli, Ferris Urbanowski, Anne Harrington, Katherine Bonus and John Sheridan, “Alterations in Brain and Immune Function Produced by Mindfulness Meditation.” *Psychosomatic Medicine* 65 (2003): 564 – 570.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

The present chapter expands on the previous chapter via a review of scientific literature involving concepts integral to the present research study. This review will begin with what is currently understood about the impact of perceived stress and affect on health. Then, the health related implications of adolescence peculiar to young girls will be highlighted. The focus of this chapter will next move toward literature involving yoga based interventions similar to the one used in the present research. The objective of these broad discussions is to clarify the paradigms from which the present research study has emerged. Finally, the chapter will be devoted to a discussion of research specific to the stated hypotheses of the present study.

Stress and Health

Most of the theories currently explored about stress and how it affects the body can be traced to the work of Hans Selye, who not only coined the term “stress” but devoted his entire professional life to investigating its impact on the human form.

A clumsy scientist can be blamed for introducing stress into our lives. Hans Selye, a young endocrinologist in the 1930’s, had a habit of dropping his laboratory rats on the floor, chasing them around the room, and trapping them beneath the sink. Soon they developed ulcers and shrunken immune systems. Selye did many tests and came to the realization that his clumsiness was making them sick. Selye, a Hungarian born in Vienna and working in Canada, searched for an English word to describe this response to life under tension. Borrowed from the field of engineering, the term “stress” was born.¹

Selye’s model of how the body responds to stress is called General Adaptation Syndrome (GAS) and is accompanied by specific behavioral and physiological responses

intended to preserve homeostasis and increase chances for survival.² The physiological changes associated with GAS include increases in blood pressure, heart rate and respiratory rate; an inhibition of growth and reproductive systems; a containment of the inflammatory and immune responses;³ release of sugar into the bloodstream for energy; and an increase in muscular tension.⁴ Behavioral changes associated with GAS include increased arousal and alertness, as well as a suppression of feeding and reproductive behavior.⁵ “Generally, the stress response is meant to be acute or at least of a limited duration.”⁶

Activation of the stress response is indeed necessary for survival. However, inappropriate or prolonged activation of GAS has been associated in the literature with a wide variety of disease processes. Research has linked dysfunctional activation of the GAS with “various pathophysiologic states that cut across the traditional boundaries of medical disciplines.”⁷ Various factors have been found to influence the potentially harmful activation of the GAS, including genetic predisposition⁸ and exposure to trauma as experienced in cases of Post Traumatic Stress Disorder. There is evidence that a dysfunctional activation of the GAS response itself may trigger further inappropriate GAS activation. “Thus, inappropriate adaptational responses could be maladaptive and act as stressors themselves, feeding into a sustained vicious cycle.”⁹

According to current understanding, the body does not make a distinction between physical and emotional stress and hence, its reaction to stress is the same regardless of the initial threat to its homeostasis.¹⁰ Furthermore, the GAS is activated more by the individual’s perception of the “threat to homeostasis” than by the actual threat itself.

“Different individuals who encounter the same source of stress may either produce completely different symptoms or no symptoms at all.”¹¹

The most widely used scientific measure of an individual’s perception of “threat to homeostasis” is called the Perceived Stress Scale (PSS) and was developed by Sheldon Cohen and his team of researchers. Cohen’s research found that, “In general, life-stress scores based on self ratings of event stressfulness are better predictors of health related outcomes than scores derived from either a simple counting of events (unit weighting) or normative adjustment ratings.”¹² The PSS was designed to assess the degree to which a person experiences their life as “unpredictable, uncontrollable, and overloading.”¹³ According to the model used in the development of the PSS, stress is assessed within the “context of [a] person’s social, environmental and personal resources.”¹⁴ Thus the more a person feels the need to respond to a situation and the more he or she feels the situation requires more than he or she is capable of, the more stressful the situation is perceived for that person. Because PSS does not “tie appraisal to particular situations, it is sensitive to the nonoccurrence of events as well as ongoing life circumstances, to stress resulting from events occurring in the lives of friends or relatives, and to the expectations concerning future events.”¹⁵

Research utilizing the PSS has confirmed that how a person perceives the potential stressor plays an important role in how the stressor impacts the body. One study in particular found that psychological processes “were a better predictor of somatic complaints than lifestyle.”¹⁶ In this study, measures for optimism, perceived stress, anxiety, Type A behavior, attributional style and health heartiness were correlated with a symptom checklist for somatization in a group of 105 undergraduate psychology

students. Information was also gathered regarding lifestyle such as alcohol usage, smoking, and frequency of exercise. “Psychological variables explained almost half of the variance in somatic complaints, whereas lifestyle variables hardly explained any of that variance.”¹⁷ Davidsdottir, the study’s author, admits that the somatic complaints associated with alcohol and nicotine use or insufficient exercise may not yet be apparent in such a young population. However, his research showed that one of the strongest predictors for the reported somatic complaints was perceived stress. Davidsdottir’s advice to health practitioners working with young adults is that:

“How they manage their stress, how they explain to themselves negative events in their lives, and how much control they believe they have over their own health all seem to be factors strongly associated with their well-being and so should be considered when experts try to help them promote their health.”¹⁸

Perceived stress levels have also been shown to indirectly impact health via the perception and retention of health related messages. A study published in 2005 assessed the impact of the perceived stress levels of 142 undergraduates on the processing and recall of health detection and health promotion messages.¹⁹ The study found that as perceived stress levels increased the time spent reading messages encouraging health detection screenings such as cholesterol and blood pressure checks decreased. The recall of health detection messages also decreased as perceived stress levels increased. Perceived stress levels did not influence retention of health promoting messages such as those encouraging diet and exercise. This research suggests that the more stressed a person perceives him or herself to be; the less likely he or she is to listen to advice on early detection of disease processes.

Emotions and Health

Research into the effects of emotion or affect on health reveals that emotion, whether positive (such as joy and happiness) or negative (such as depression and anxiety), can be both health enhancing and/or present a potential health risk. In other words, the relationship between emotions and health is complex. The table below offers a broad overview of the potential implications of emotions as they apply to health and well-being.

Table 1: Emotions and Health

	Negative Affect (NA)	Positive Affect (PA)
Health Enhancing	Action oriented (i.e.: anger) Energy conservation (i.e.: depression) Reflection; personal evaluation Immune enhancing (in short bursts)	Increased social interaction “Hearty” immune, endocrine and cardiovascular response Resilience – quick healing
Health Risk	Depressed immune, endocrine and cardiovascular functions Social isolation Unhealthy lifestyle choices Slow healing	Hypo manic and manic states (in extremes) Feelings of invulnerability and grandiosity Unrealistic optimism/denial Noncompliance with healthcare recommendations/risk taking behaviors

Research into the effects of emotion on health focuses mostly on “negative” emotional states such as depression, anxiety and anger. “Studies on negative emotions (e.g. fear/anxiety, anger/hostility, and distress/depression) and health outnumber studies of positive emotions (e.g. joy, happiness, elation, relaxation) and health by more than 11 to 1. The vast majority of these studies find negative emotions predict or correlate with disease.”²⁰ The impact of negative emotions on health “may occur indirectly, through health behaviors or compliance with medical regimens, and directly, through alterations

in the functioning of the central nervous system, immune, endocrine and cardiovascular systems.”²¹

From a behavioral perspective, negative emotions are associated in the literature with cigarette smoking, physical inactivity and alcohol abuse;²² risky health behaviors, substance abuse, over-eating, high risk sexual behavior, and undermining social support systems.²³ The lower social support and social isolation associated with negative affect is linked to increased risk of premature death.²⁴ Negative affect has been shown to narrow the thought-action repertoire.²⁵ The thought-action repertoire is one mechanism by which “people discover and build new skills and resources, ranging from physical and intellectual resources, to social and psychological resources.”²⁶

Research has also explored physiological changes associated with negative emotions that impact health. For example, high hostility is associated in the literature with high blood pressure, a known risk factor in cardiovascular disease.²⁷ Chronic depression is associated with sustained hypothalamic-pituitary-adrenocortical (HPA) activation, which is known to suppress immunity.²⁸ Negative emotions have also been linked to increased right prefrontal brain activity, an area of the brain associated with suppression of the immune system.²⁹

The literature does point to a few distinct health advantages of negative emotions. Anger and fear, for example, prepare the body for action. They initiate the “fight or flight” response (GAS as discussed previously) which is a self protection mechanism in the body. Conversely, emotions such as depression and sadness allow the body to conserve energy. Author, Larry Dossey laments that “we have pathologized unhappy states of mind,”³⁰ and that perhaps the capacity for negative affect in humans holds a

distinct evolutionary advantage. Within the capacity to imagine the worst possible outcomes in any given situation lies the ability to be prepared for and react appropriately to potential threats. “Were it not for our intrinsic capacity to feel sad, we might not be around to lament the fact that we are not always ecstatic.”³¹

There is evidence that, at least in the short term, negative emotions may be beneficial to overall health. Human and animal studies have validated immune-enhancing effects of short bursts of emotional arousal resulting in what is termed a “toughness” pattern of physiological response.³² Negative emotions are indirectly beneficial through an association with the Behavioral Inhibition System, a protective mechanism that “keeps us out of danger by refraining from behavior that endangers our changes for survival.”³³ Anxiety and guilt have been associated with preventative health behaviors and care seeking.³⁴ Depression and distress have been shown to increase symptom sensitivity, accuracy of illness perception and to facilitate care-seeking and receipt of support.³⁵

While less widely researched, evidence is emerging to suggest that positive emotions also influence health whether it is susceptibility to common viruses, ability to cope with stressful life events, the propensity for selecting healthy lifestyle choices, or determining the outcome of a medical intervention or disease processes.³⁶

“It has been less well studied, perhaps, but we do now have a strong suggestion that positive emotion, positive feelings and states of expectancy, can work not only to enhance our health but to eliminate disease, sometimes counter to all odds.”³⁷

In the literature, positive emotions are associated with increased longevity; better sleep, better dietary habits and increased physical exercise; increased social support

which is associated with decreased mortality; increased resistance to disease; lower incidence of coronary heart disease and faster recovery from coronary heart disease,³⁸ as well as a faster recovery from the physiological responses to stress.³⁹ In the brain, positive emotions are associated with increased left pre-frontal brain activity, an area of the brain associated with enhanced immune response.⁴⁰ Positive emotions have been shown to allow individuals to think more creatively, bounce back more quickly from adversity, and strengthen connections with others.⁴¹ According to some researchers, positive emotions broaden the scope of attention and thought-action repertoires.⁴² Through what is termed the Behavioral Activation System, positive emotions initiate purposeful activity thus, moving an individual toward rewards.⁴³ A lack of positive affect is associated with a failure to engage in meaningful activity and thus is correlated with depression.⁴⁴

Positive emotions are clearly beneficial to health and well-being; however, excessive positive emotions indirectly place individuals at risk for disease and injury via actions initiated without forethought or restraint.⁴⁵ Most of the research in this area involves extremes of positive emotional moods such as those found within the context of bipolar disorders. These states of uncontrolled positive affect are associated with many health risks including increased risk taking on personal, financial, interpersonal and social levels; risky sexual behavior; increased substance abuse; insomnia; and excessive feelings of invulnerability and grandiosity.⁴⁶ Outside the realm of bipolar disorder, research on the potential health risks of positive emotional states focuses primarily on studies of “unrealistic optimism.” These studies have shown that “perceived vulnerability is an important motivator for people to do something about their health.”⁴⁷

Unrealistic optimism influences individual's decisions regarding preventative health screenings⁴⁸ and fosters complacency with perceived health risks.⁴⁹ Research has shown that people in general are “unrealistically optimistic about their own health risks as compared with those of other people.”⁵⁰ Overall, the limited literature in this area suggests that positive emotions, at least in their extremes, may harbor detrimental health implications.

Clearly, positive and negative emotions impact health and well-being, and the interactions are complex. An avenue of research pursuing an understanding of this complexity is investigating the combinations of positive affect (PA) and negative affect (NA) as they form affective personality styles. Researchers using the Positive and Negative Affect Scale (PANAS) have defined four distinctive affective personalities:

Self-Actualizing	(High PA; Low NA)
High Affective	(High PA; High NA)
Low Affective	(Low PA; Low NA)
Self-Destructive	(Low PA; High NA)

From the relatively small reservoir of research in this area interesting implications have emerged. Self-actualizers score high in measures of psychological health, feelings of responsibility, affective stability and original thinking as compared to self-destructive personalities.⁵¹ They also perform better under stress⁵² and report better sleep patterns than those who score as self-destructive personalities.⁵³ Measured “thriving” is associated with high affective personalities.⁵⁴ These high affective personality types also reported higher levels of stress, anxiety, optimism and energy than other affective personality types.⁵⁵ In one particular study, high PA scores were

associated with regularity of exercise which was found to contribute to the ability of older study participants to physically perform at the same level as the younger participants.⁵⁶ This collection of affective research is offering interesting perspectives on the complex interactions of both negative and positive affect and how they impact health and well-being.

Research into the interactions of emotion and health also offers interesting food for thought. For example, one study cited by Larry Dossey in his book, *Reinventing Medicine*, showed that actors who acted out specific emotions had measurable physiological changes concurrent with the emotions they “pretended” to have. “There is evidence that emotions, even though an ‘act,’ are associated with medically significant changes in the body.”⁵⁷ In summary, emotions (positive or negative; real or acted out) have been shown to enhance health as well as diminish health via their impact on physiology, social interactions and lifestyle choices.

Pathways of Impact

Physiological Model

Considering the predominance of research on negative emotions as opposed to positive emotions, it is no surprise that the predominant models used to explain how emotions impact health is developed from research on negative emotional states and traits. The theoretical models used to explain the body’s physiological response to negative emotions closely resemble the General Adaptation Syndrome model developed in the 1930’s by Hans Selye to explore the effects of stress on the body. “Health researchers consider physiological arousal to be a primary pathway through which emotions may influence health.”⁵⁸ Emotions such as anger and fear activate what is

called sympathetic-adrenal medulla (SAM). SAM prepares the body for “effortful responding,” or what Seyle termed “fight or flight.” Depression, distress and sadness activate what is called the pituitary-adrenal cortex (PAC), which is designed to conserve the body’s energy. Within this model of mind-body interaction the threat for illness and disease occur in primarily one of two pathways: when the SAM and/or PAC reaction is inappropriate to the threat (either too little or too much response); or when the SAM and/or PAC reaction persists beyond what is needed to attend to the threat.⁵⁹

Behavioral Model

The most prevalent model utilized to explain the behavioral dimension of emotion and health categorizes behavior into two broad system classifications: the Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS). The BAS (a.k.a.: Behavioral Approach System, Behavioral Facilitation System, Approach Process⁶⁰) initiates purposeful activity via arousal response to reward and non-punishment. Actions within this system bring the individual closer to anticipated reinforcers through exploratory behaviors. Physiologically, the BAS is associated with left prefrontal brain activation accompanied by less activation of the amygdala.⁶¹ BAS operates during active approach or avoidance actions. At its best, BAS facilitates healthy lifestyle choices, social interactions and meaningful living. An overly sensitive BAS, however, is associated with lack of forethought or restraint and an increased risk of manic symptoms or impulsive control disorder. With an insensitive BAS very few stimuli are perceived as rewarding and there is an increased vulnerability to depressive symptoms.⁶²

The BIS (a.k.a. Withdrawal System, Avoidance Process⁶³) suppresses behavior anticipated to lead to punishment, pain or non-reward. It moves the individual away from

what is perceived as harmful. Right prefrontal brain activation is associated with activation of the BIS.⁶⁴ BIS operates during passive approach and avoidance actions. A hyper-sensitive BIS is marked by inhibited behavior, vigilance, anxiety in response to signals of perceived punishment, and increased risk of anxiety disorders. A lack of reactivity to signals of punishment and an increase in antisocial and psychopathological symptoms are associated with an insensitive BIS.⁶⁵

One might be inclined to associate positive emotions with BAS and negative emotions with BIS. Some researchers in fact view extroversion, positive affect and the BAS as equivalent.⁶⁶ Others, however, point out the complexity of emotion in relation to behavioral approach and avoidance processes. Viewed as a feedback mechanism for the effectiveness of one's behavior within the context of these two processes, emotion expands into distinct continuums of negative and positive potential. A two dimensional representation of this complex behavioral interaction might yield the following diagram:

Table 2: Behavioral Model

	Behavioral Activation System (Moving toward positive reinforcers)	Behavioral Inhibition System (Avoiding punishment or harm)
Successful	Elation Eagerness	Relief Calm
Unsuccessful	Sadness Depression	Fear Anxiety

From this perspective neither BAS nor BIS is intrinsically associated with only positive or negative emotions. What matters is whether or not the behaviors within the system are perceived as successful. Emotions from this perspective become part of a feedback mechanism allowing the individual to adjust behaviors to move closer toward

intended goals and away from punishment or harm. This model provides a framework for understanding the behavioral impact of emotions on health.

To encapsulate the evidence presented thus far, the literature suggests that health can be compromised by inappropriate or sustained responses to emotional or physical stress. Most of the research previously cited involves adults, however. What, then, is revealed in the literature about adolescent girls, the population of interest for the present research? What is currently understood about how the health and well-being of young women is influenced by their emotional states and their perceptions of stress?

Challenges of Adolescence for Young Women

“Health behavior established during adolescence and young adulthood may have a significant impact on health behaviors and occurrence of diseases later in life”⁶⁷

The literature as it relates to the health implications of adolescence for young women paints a rather bleak picture. The American Psychological Association claims that, “Compared with boys of the same age, adolescent girls are more anxious and stressed, experience diminished academic achievement, suffer from increased depression and lower self-esteem, experience more body dissatisfaction and distress over their looks, suffer from greater number of eating disorders, and attempt suicide more frequently.”⁶⁸

Consistent with the tendency in the literature to focus on negative emotional extremes, the vast majority of studies involving adolescents and emotions relate to depression. Collectively, the literature points toward a significantly higher incidence of depression in adolescent girls than in boys of the same age group.⁶⁹ Research utilizing the PANAS scale (one of the measured used in the present study) found that adolescent girls reported lower positive affect scores (PA) and higher negative affect scores (NA)

than their male counterparts.⁷⁰ Low PA is consistently linked with depression in the literature. High NA is linked to both depression and anxiety.⁷¹ Depressive and anxious symptoms were highly associated with adolescent girls as compared to boys in one particular study involving psychiatric inpatients.⁷²

Research suggests that increased depressive affect emerges in girls by the 12th grade and is related to evidence that girls experience more challenges in early adolescence than boys.⁷³ The challenges to young women are reportedly due in part to the physiological changes occurring in adolescence. The growth spurts associated with puberty begin earlier for girls than for boys. And while the physiological changes of puberty bring welcomed height and muscle mass to boys, girls experience an unwanted increase in body mass index (BMI) during puberty.⁷⁴ Self esteem has been shown to plummet in teenaged girls as BMI rises, particularly in white adolescent girls.⁷⁵

Various explanations for this increased risk for depression in girls have been investigated. One study looked into the hormonal changes in adolescent girls as they relate to depressive affect. Rather than being related to hormone levels or even pubertal status and timing, issues of perceived stress were associated with negative affect in this group of adolescent girls. Social factors and interaction with negative life events were correlated in this study with depressive and aggressive affect.⁷⁶ Other research has explored the relationship between a depressed mother and the potential for depression in her offspring. It has been shown that depressed mothers express more negative affect to their daughters than to their sons; and that the episodes of negative affect in depressed mothers correlate with episodes of negative affect in their daughters.⁷⁷

Higher rates of depression and anxiety in adolescent girls versus boys of the same age appear to be unaffected by socio-economic advantages. A growing body of research is emerging that exposes the psychosocial pressures of the children of upper-class, highly educated parents. Assumed to be a “low risk” sub-group of adolescents, research is now showing that they, indeed, are “at risk” in many ways.⁷⁸ For example, “studies have shown that upper-class children can manifest elevated disturbances in several areas – such as substance abuse, anxiety, and depression – and that two sets of factors seem to be implicated, that is, excessive pressures to achieve and isolation from parents (both literal and emotional).”⁷⁹ In one data set involving 302 affluent seventh graders, girls rated twice as high on measures of clinically significant depressive symptoms as compared to the norms for the same age group.⁸⁰ In a related data set, scores of depression and anxiety remained high for girls over time while scores for the boys remained at near average for both assessments.⁸¹ Researchers of affluent adolescents have also found a high correlation between substance abuse and high levels of depression and anxiety, pointing toward a maladaptive tendency within this population to self medicate rather than seek assistance for mental disorders. 72% of the adolescent girls in one study’s upper class population reported having used alcohol as compared to the 61% figure reported as a national norm in the same age group.⁸²

The high incidence of depression in adolescent girls impacts more than just the young women themselves. The United States Department of Justice published a report on the link between depression and delinquency in adolescent girls.⁸³ The report summarized the initial findings of a longitudinal survey involving thousands of ethnically and socio-economically diverse Chicago residents including community leaders,

adolescents and children. “Even controlling for socioeconomic status, mildly to moderately depressed girls were more likely to commit property crimes and crimes against other people than their nondepressed counterparts.”⁸⁴ Specifically, the survey found that 40% of all the girls interviewed engaged in property crimes, while 68% of those who reported being mildly or moderately depressed reported engaging in property crimes. While 42% of all the girls reported activities involving crimes against other people, 82% of the depressed girls engaged in these types of activities. 57% of the mildly to moderately depressed girls reported higher levels of aggressive activity as compared to 13% of the non-depressed girls.⁸⁵

To be sure, not all of the research has shown a gender predisposition toward depression in adolescents. One study involving 225 adolescents revealed no direct effect of gender or self-esteem in depression scores. Perceived stress, however, emerged as having the strongest effect on depression in adolescents regardless of gender.⁸⁶ While not specific to adolescent girls, perceived stress is positively correlated with a wide array of health risks in adolescents including smoking, adoption of negative coping methods such as anger and helplessness, lower utilization of positive coping methods.⁸⁷

Throughout the literature, adolescent girls consistently report higher perceived stress scores in comparison to boys. One study showed that girls scored higher on perceived interpersonal stress scores, used more social support, scored higher on maladaptive coping strategies, and scored higher on emotional distress than boys of the same adolescent age group. Researchers in this study concluded that “due to their augmented perceived stress and maladaptive coping pattern, early and middle adolescent girls are prone to internalizing disorders.”⁸⁸ Another study supported these findings by

concluding that “girls experience higher levels of episodic stress and are more reactive to these stressors, increasing their likelihood of becoming depressed compared to boys.”⁸⁹

The emotion and stress-related challenges for girls in adolescence is shown in the literature to impact health and well-being far beyond the teenage years. One study investigating the extremes of the maladaptive coping patterns measured in some adolescent girls found that conduct disorders predicted more health problems in adulthood, poorer self reported overall health, lower body mass index, increased alcohol and marijuana dependence, tobacco dependence, more lifetime sexual partners, sexually transmitted diseases and early pregnancies. In this same study, depression among adolescent girls with conduct disorders predicted tobacco dependency as well as more medical problems in their adult lives. Adolescent anxiety was predictive of more overall medical problems as this group of young women with conduct disorders reached adulthood.⁹⁰

In summary, a substantial body of evidence exists that emphasize the health impacting challenges of adolescence for young women. Less evident from the literature are specific self care interventions that can assist adolescent girls during their transitions to adulthood, specifically as related to perceived stress levels and emotional states. Research into the effects of hatha yoga, in primarily adult populations, offers promise for finding an intervention helpful in mediating affect and stress.

Yoga and Health

Research into the benefits of yoga was introduced to mainstream America through the work of Dr. Dean Ornish and his Program for Reversing Heart Disease.⁹¹ The program includes physiological interventions such as diet and exercise, but it also

scientifically validates the effects of the “mind-body” interaction through yoga, meditation and counseling. Currently, research on the effects of hatha yoga is flourishing. Yoga has been shown to be significantly beneficial as a treatment intervention in such diverse areas as living with HIV/AIDS; low back pain; breast and prostate cancer survivors; cardiovascular disease; diabetes; anxiety; depression; osteoarthritis; eating disorders; weight loss; pregnancy; insomnia; chronic fatigue; asthma; multiple sclerosis; chronic pain; exercise related muscle soreness; ADHD; mood disorders; stress management and geriatrics.⁹²

The largest body of research investigating yoga’s impact on affect involves studies on depression. A review published in 2005 of studies involving yoga and depression points toward yoga as an effective intervention. The review resulted from a search conducted from January to June of 2004 of randomized controlled studies published in major biomedical databases (MEDLINE and CINAHL, for example). The search included publications from the inception of each data base. Of the five studies that met the criteria of the reviewers, virtually all of them reported improvements in depressive symptoms regardless of the type of yoga practice, the length or duration of the intervention.⁹³ The interventions studied ranged from a 20 minute yoga based treatment on three consecutive days to 60 minute interventions that lasted for 30 days or more. The age of the populations involved was between 18 and 48 years of age. The only side effect noted was tiredness and breathlessness in participants with no previous exercise experience. This side effect was noted in only one study. While promising, these studies cannot be generalized for several reasons. Many of the participants were self selected. In other words, they chose to participate in a yoga intervention. Yoga as a treatment for

depression was not compared to other proven methods of treatment in any of these studies. Most of the studies involved small research groups as well, so that generalization to larger and less homogenous populations would be inappropriate.

Other research not included in the above mentioned review on yoga and depression also produced promising results. One study involving female coeds compared yoga, Feldenkrais, aerobics, swimming and a computer lesson.⁹⁴ Significant mood enhancement was reported only in the coeds who participated in the Feldenkrais and yoga lessons. It is worth noting that the intervention involved only one session of each activity. The participants did, however, self select the intervention that interested them most. In another study involving self reported “distressed” females, a three month yoga practice resulted in significant improvement in perceived stress and psychological mood measures.⁹⁵ Again, the participants were self selected for the study.

The research that sparked the imagination of the present study’s PI was the study by West and his colleagues involving yoga, African Dance and a biology lecture (mentioned in Chapter One.)⁹⁶ One 90 minute session of hatha yoga was shown in the study to significantly reduce self rated negative affect and perceived stress levels. Positive affect scores, however, remained consistent in the group who participated in the yoga session. This study involved 69 college coeds who self selected to participate in one of the three intervention sessions (African dance = 21, yoga = 18, and biology lecture = 30).⁹⁷ Inspired by the West study, the present research was designed to investigate the impact of six sessions (rather than one) of a yoga based practice on positive and negative affect, as well as perceived stress levels, in a sample of adolescent girls who did not specifically choose to participate in the sessions.

Hypotheses Rationale

The research hypothesis for the present study is stated in Chapter One and again in the methodology chapter (Chapter Three). Briefly stated, the present study hypothesized a significant change in self rated affect and perceived stress scores in a group of adolescent girls after they participated in six sessions of a yoga based practice of body awareness and intentional relaxation.

Anticipated Changes In Negative Affect: As measured by the PANAS scale, “Negative Affect (NA) is a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness, *with low NA being a state of calmness and serenity.* [italics added]”⁹⁸ The intervention in this research was designed specifically to foster and consciously practice states of “calmness and serenity.” As such, it was anticipated that a regular practice of these states (in the present study, six consecutive sessions) would lower the self rated negative affect scores of the participants as measured by PANAS.

The study by West and his colleagues supports the expectation in the present research of a significant change in negative affect. The West research demonstrated that negative affect scores significantly decreased in a group of college aged students after just one 90 minute session of yoga. One goal of the present study was to assess if this change in affect would be observed in a research population of adolescent girls. It should be noted that in the West study, the PANAS scale was administered immediately following the 90 minute yoga session. Thus, the measure assessed the immediate impact of yoga on negative and positive affect as measured by PANAS. The present research

was designed to assess the longer range affective impact of a six week yoga based practice, with the post intervention measure taking place one week after, and not immediately following, the yoga based series.

The intervention sessions of the present research were designed to foster a conscious practice of releasing mental, physical, emotional and spiritual tension and thus entering a relaxed state for brief periods of time. “Generally, the so-called ‘negative’ emotions like anger and fear are accompanied by an increase in tension, while ‘positive’ emotions like joy and affection are accompanied by a release in tension.”⁹⁹ A leader in Mind-Body Medicine, Joan Borysenko, further categorizes emotions and their corresponding physiological responses into two broad distinctions of fear and love. “The fear category was associated with defense of the body-muscle tension, rapid heart beat, and a sense of holding tight. The love category was associated with openness and a sense of letting go and relaxation.”¹⁰⁰ Consistent with this model, it was anticipated that negative affect scores would be reduced as the physical, mental and emotional tension was consciously released during the intervention sessions.

Anticipated Changes in Positive Affect: Anecdotal evidence accumulated over 20 years of professional experience by the PI of the present study, points to a reliably repeated enhancement of positive affect with the practice of the proposed intervention for this research, regardless of the duration of the practice. The West study, however, found that positive affect (PA) scores significantly increased only in those who participated in the African Dance session. The PA scores did not increase but remained consistent in those who participated in the yoga session. Watson and Clark, the researchers who developed the PANAS scale, reported that PA as measured by the scale was associated

with social interaction.¹⁰¹ This could offer an explanation as to why PA scores increased in the West study with one session of African Dance and not with one session of yoga. Speculatively, the elevation in PA scores could have been impacted by the social nature of dance in general. Practices such as yoga and meditation are introspective, and not social, in nature and thus may not reflect immediate changes in self scored positive affect as measured by PANAS. In addition to their introspective nature, these methods encourage a non-judgmental awareness and acceptance of physical, mental and emotional states in present time consciousness. This includes awareness of emotional states that may be unpleasant or uncomfortable, which may offer an explanation as to why self scored ratings of positive affect did not change as a direct result of the single 90 minute yoga intervention studied in the West research. Perhaps the element of time is necessary for an intervention of this type to impact positive affect.

Evidence from the field of brain research offers interesting information about the brain's response to positive affect and mindfulness meditation over time. In 1998, Richard Davidson and his colleagues found that positive affect as measured by the PANAS scale was associated with left frontal brain activity.¹⁰² Later, in collaboration with mindfulness meditation researcher Jon Kabat-Zinn, Davidson published a study reporting significant increases in left frontal brain activity in a group of 25 people who had practiced mindfulness meditation over an 8 week period.¹⁰³ Curiously, while the part of the brain associated with positive affect changed in this group of mindfulness meditation practitioners, their self rated positive trait affect scores did not change significantly.

Anticipated Changes in Perceived Stress Levels: The West study found that self-rated perceived stress scores as measured by PSS decreased after one session of yoga. There was no reason to believe these effects would be any different with the extended yoga based intervention in this study. Other research supports the changes in perceived stress levels reported in the West study. A study published in December of 2005, found that PSS scores significantly lowered after a three month, bi-weekly yoga practice in a group of 24 females who defined themselves as emotionally distressed.¹⁰⁴ Another study involving the “relaxation response-based-skills” of breathing, imagery, progressive muscle relaxation, yoga stretches and mindfulness found that perceived stress levels decreased in a group of college students who practiced for six weeks.¹⁰⁵

Interestingly, Watson who developed the PANAS scale found that “within-subject variations in perceived stress were strongly correlated with fluctuations in NA but not in PA.”¹⁰⁶ Negative affect, and not positive affect, are strongly correlated with perceived stress levels according to Watson’s research. Based on these findings, one would anticipate that as NA scores decreased, perceived stress levels would also decrease.

Summary

Evidence is accumulating to explain the interactions of emotions and perceptions of stress on health and well being. Science is beginning to not only uncover the mechanisms involved in these interactions, but to also explore techniques that can mediate the sometimes detrimental influences of emotions and perceived stress on health. The present research emerged (with great respect and gratitude on the part of the PI) from a robust ancestry of scientific investigation highlighted in this literature review. With

hopes of adding to that scientific heritage, the next chapter will detail the methodology involved in the present research.

Chapter 2 Endnotes:

-
- ¹ George Manning, Kent Curtis, and Steve McMillan, *Stress: Living and Working in a Changing World* (Duluth, MN: Whole Person Associates, 1999), 4.
- ² Manning, Curtis, and McMillan, 5.
- ³ George P. Chrousos and Phillip W. Gold, "The Concepts of Stress and Stress System Disorders: Overview of physical and behavioral homeostasis." *Journal of the American Medical Association* 267, no. 9 (March 4, 1992): 1245.
- ⁴ Serge Kahili King, *Urban Shaman: A Handbook for Personal and Planetary Transformation based on the Hawaiian Way of the Adventurer* (New York: Simon & Schuster, 1990), 84 – 86.
- ⁵ Chrousos and Gold, 1245.
- ⁶ Chrousos and Gold, 1247.
- ⁷ Chrousos and Gold, 1244.
- ⁸ Ilona S. Federenko, Wolff Schlotz, Clemens Kirschbaum, Meike Bartles, Dirk H. Hellhammer and Stefan Wust, "The Heritability of Perceived Stress." *Psychological Medicine* 36, no. 3 (March 2006): 375 – 85.
- ⁹ Chrousos and Gold, 1249.
- ¹⁰ Chrousos and Gold 1245.
- ¹¹ Serge King, *Instant Healing* (Los Angeles: Renaissance Books, 2000), 47.
- ¹² Sheldon Cohen, Tom Kamarck, and Robin Merlerstein, "A Global Measure of Perceived Stress." *Journal of Health and Social Behavior* 24 (December 1983): 386.
- ¹³ Cohen, Kamarck and Merlerstein, 387.
- ¹⁴ Sheldon Cohen, "Contrasting the Hassles Scale and the Perceived Stress Scale: Who's really measuring appraised stress?" *American Psychologist* 41, (June 1986): 717.
- ¹⁵ Cohen, 718.
- ¹⁶ Sigurlina Davidsdottir, "Do We Think Ourselves Sick? Psychological Processes and Health Associated with Adolescent Somatic Complaints," *Counseling and Clinical Psychology Journal* 1, no. 1 (2004): 42 – 59.
- ¹⁷ Davidsdottir, 54.
- ¹⁸ Davidsdottir, 54.
- ¹⁹ Murray Millar. "The Effects of Perceived Stress on Reactions to Messages Designed to Increase Health Behaviors." *Journal of Behavioral Medicine* 18, no. 5 (October 2005): 425 – 432.
- ²⁰ Tracy J. Mayne, "Negative Affect and Health: The Importance of Being Earnest." *Cognition and Emotion* 13, no. 5 (1999): 602.
- ²¹ Janice K. Kiecolt-Glaser, Lynanne McGuire, Theodore F. Tobles, and Ronald Glaser, "Emotions, Morbidity, and Mortality: New Perspectives from Psychoneuroimmunology." *Annual Reviews of Psychology* 53 (2002): 87 – 88.
- ²² Margaret A. Chesney, Lynae A. Darbes, Kate Hoerster, Jonelle M. Taylor, Donald B. Chambers, and David E. Anderson, "Positive Emotions: Exploring the other hemisphere in behavioral medicine." *International Journal of Behavioral Medicine* 12, no. 2 (2005): 50 – 58.
- ²³ Mayne, 601 – 635.
- ²⁴ Chesney, et al, 50 – 58.
- ²⁵ Barbara Fredrickson and Christine Branigan, "Positive Emotions Broaden the Scope of Attention and Thought-Action Repertoires." *Cognition and Emotion* 19, no. 3 (April 2005): 313- 332.

-
- ²⁶ Donald Yerxa, "Broaden and Build: A Conversation with Barbara Fredrickson." *Science and Theology News* (http://www.stnews.org/print.php?article_id=2380) retrieved July 2, 2006.
- ²⁷ Chesney, et al, 50 – 58.
- ²⁸ Ibid.
- ²⁹ Ibid.
- ³⁰ Larry Dossey, "Note on the Journey: In Praise of Unhappiness." *Alternative Therapies in Health and Medicine* 2, no. 1 (January 1996), 7 - 11.
- ³¹ Dossey, 7 – 11.
- ³² Mayne, 601 – 635.
- ³³ E. Voogt, A. van der Heide, A. F. van Leeuwen, A. P. Visser, M. P. Cleiren, J. Passchier, and P. J. van der Mass, "Positive and Negative Affect after Diagnosis of Advanced Cancer." *Psycho-oncology* 14, no. 4 (April, 2005): 262 – 273.
- ³⁴ Mayne, 601 – 635.
- ³⁵ Ibid.
- ³⁶ Chesney, et al, 50 – 58.
- ³⁷ Robert Ornstein and Charles Swencionis, eds, *The Healing Brain: A Scientific Reader* (New York: Guilford Press, 1990), 63.
- ³⁸ Chesney, et al, 50 – 58.
- ³⁹ Barbara Fredrickson, Robert A. Mancuso, Christine Branigan, and Michele M. Tugade, "The Undoing Effect of Positive Emotions." *Motivation and Emotion* 24, no. 4 (December 2000): 237 – 258.
- ⁴⁰ Chesney, et al, 50 – 58.
- ⁴¹ Ami Albernaz, "Why It's Good to Feel Good." *Science & Spirit* (2002) www.science-spirit.org/printerfriendly.php?article_id=457.
- ⁴² Fredrickson and Branigan, 313- 332.
- ⁴³ Lena C. Quilty and Jonathan M. Oakman, "The Assessment of Behavioral Activation: The Relationship between Positive Emotionality and the Behavioral Activation System." *European Journal of Personality* 18 (2004): 557 – 571.
- ⁴⁴ Voogt, et al, 262 – 273.
- ⁴⁵ Quilty and Oakman, 557 – 571.
- ⁴⁶ National Alliance on Mental Illness, www.NAMI.org.
- ⁴⁷ David Dunning, Chip Heath, and Jerry M. Suls, "Flawed Self-Assessment: Implications for Psychotherapy." *Psychological Sciences in the Public Interest* 5, no. 3 (2004): 80.
- ⁴⁸ S. Barnoy, Y. Bar-Tal, and L. Treister, "Effect of Unrealistic Optimism, Perceived Control over Disease, and Experience with Female Cancer on Behavioral Intentions of Israeli Women to Undergo Screening Tests." *Cancer Nursing* 26, no. 5 (October 2003): 363 – 369.
- ⁴⁹ Dunning, Heath and Suls, 69 – 106.
- ⁵⁰ Dunning, Heath and Suls, 69.
- ⁵¹ Sven-Ake Bood, Trevor Archer and Torsten Norlander, "Affective Personality in Relation to General Personality, Self-Reported Stress, Coping and Optimism." *Individual Differences Research* 2, no. 1 (April 2004): 26 – 37.
- ⁵² Torsten Norlander, Sven-Ake Bood, Trevor Archer, "Performance Under Stress: Affective Personality, Age, and Regularity of Physical Exercise." *Social Behavior and Personality* 30, no. 5 (2002): 495 – 508.
- ⁵³ Torsten Norlander, Asa Johansson, and Sven Ake Bood, "The Affective Personality: Its Relation to Quality of Sleep, Well-Being and Stress." *Social Behavior & Personality* 33, no. 7 (2005): 709 – 722.
- ⁵⁴ Torsten Norlander, Helena Von Schedvin and Trevor Archer, "Thriving as a Function of Affective Personality: Relation to Personal Factors, Coping Strategies and Stress." *Anxiety, Stress and Coping* 18, no. 2 (June 2005): 105 – 116.
- ⁵⁵ Norlander, Johansson, and Bood, 709 – 722.
- ⁵⁶ Norlander, Bood, and Archer, 495 – 508.
- ⁵⁷ Larry Dossey, *Reinventing Medicine: Beyond Mind-Body to a New Era of Healing* (New York: Harper Collins Publishers, 1999), 113.
- ⁵⁸ Sheldon Cohen and Sarah D. Pressman, "Positive Affect and Health." *Current Directions in Psychological Science* 15, no. 3 (2006): 124.
- ⁵⁹ Mayne, 601 – 635.

-
- ⁶⁰ Charles S. Carver, "Affect and the Functional Bases of Behavior: On the Dimensional Structure of Affective Experience." *Personality and Social Psychology Review* 5, no. 4 (2001): 345 – 356.
- ⁶¹ Ibid.
- ⁶² Quilty and Oakman, 557 – 571.
- ⁶³ Ibid.
- ⁶⁴ Carver, 345 – 356.
- ⁶⁵ Quilty and Oakman, 557 – 571.
- ⁶⁶ Ibid.
- ⁶⁷ Diane Von Ah, Sheryl Ebert, Anchalee Ngamvitroj, Najin Park, and Duck-Hee Kang, "Predictors of Health Behaviours in College Students." *Journal of Advanced Nursing* 48, no. 5 (2004): 472.
- ⁶⁸ <http://www.apa.org/pi/cfy/adolesgirls.html>
- ⁶⁹ Thomas E. Joiner, Jr., Janice A. Blalock, and Karen Dineen Wagner, "Preliminary Examination of Sex Differences in Depressive Symptoms among Adolescent Psychiatric Inpatients: The Role of Anxious Symptoms and Generalized Negative Affect." *Journal of Clinical Child Psychology* 28, no. 2 (1999): 211 – 219.
- ⁷⁰ Geoffrey N. Molloy, Julie F. Pallant and Aristotle Kantas, "A Psychometric Comparison of the Positive and Negative Affect Schedule across Age and Sex." *Psychological Review* 88 (2001): 861 – 862.
- ⁷¹ Voogt, et al, 262 – 273.
- ⁷² Joiner, Blalock, and Wagner, 211 – 219.
- ⁷³ Anne C. Peterson, Pamela A. Sarigiani and Robert E. Kennedy, "Adolescent Depression: Why More Girls?" *Journal of Youth and Adolescence* 20, no. 2 (April 1991): 247 – 271.
- ⁷⁴ Angela Huebner, "Adolescent Growth and Development" *Virginia Cooperative Extension Family and Child Development Publication* no. 350-380 (2000).
- ⁷⁵ Frank M. Biro, Ruth H. Striegel-Moore, Debra L. Franko, Justina Padgett, and Judy Bean, "Self-Esteem in Adolescent Females." *Journal of Adolescent Health* 39 (2006): 501 – 507.
- ⁷⁶ J. Brooks-Gunn and Michelle P. Warren, "Biological and Social Contributions to Negative Affect in Adolescent Girls." *Child Development* 60 (1989): 40 – 55.
- ⁷⁷ Joiner, Blalock, and Wagner, 211 – 219.
- ⁷⁸ Madeline Levine, *The Price of Privilege: How Parental Pressure and Material Advantage are Creating a Generation of Disconnected and Unhappy Kids*. (New York: HarperCollins Publishers, 2006)
- ⁷⁹ Suniya S. Luthar and Shawn J. Latendresse, "Children of the Affluent: Challenges to Well-Being." *Current Directions in Psychological Science* 41, no. 1 (2005): 49.
- ⁸⁰ Luthar and Latendresse, 50.
- ⁸¹ Suniya S. Luthar and Chris C. Sexton, "The High Price of Affluence." *Advances in Child Development and Behavior*. (San Diego, CA: Academic Press, 2004), 133.
- ⁸² Luthar and Sexton, 132.
- ⁸³ United States Department of Justice, "Adolescent Girls: The Role of Depression in the Development of Delinquency." *National Institute of Justice Research Preview* (July 1999)
- ⁸⁴ Ibid.
- ⁸⁵ Ibid.
- ⁸⁶ Adela Yarcheski and Noreen E. Mahon, "A Causal Model of Depression in Early Adolescents." *Western Journal of Nursing Research* 22, no. 8 (2000): 879 – 894.
- ⁸⁷ L. Sequeira, M. Diab, C. Bodian, and L. Rolnitzky. "Adolescents Becoming Smokers: the Roles of Stress and Coping Methods." *Journal of Adolescent Health* 27, no. 6 (December 2000): 399 – 408.
- ⁸⁸ Peter Hampel and Franz Petermann, "Perceived Stress, Coping and Adjustment in Adolescents." *Journal of Adolescent Health* 38, no. 4 (April 2006): 409 – 415.
- ⁸⁹ Josephine H. Shih, Nicole K. Eberhart, Constance L. Hammen, and Patricia A. Brennan, "Differential Exposures and Reactivity to Interpersonal Stress Predict Sex Differences in Adolescent Depression." *Journal of Clinical Child and Adolescent Psychology* 35, no. 1 (2006): 103 – 115.
- ⁹⁰ Anna M. Bardone, Terrie E. Moffitt, Avshalom Caspi, Nigel Dickson, Warren Staton and Phil Silva, "Adult Physical Outcomes of Adolescent Girls with Conduct Disorders." *Journal of the American Academy of Child & Adolescent Psychiatry* 37, no. 6 (June 1998): 594 – 601.
- ⁹¹ Dean Ornish, *Dr. Dean Ornish's Program for Reversing Heart Disease*. (New York: Random House, 1988)
- ⁹² International Association of Yoga Therapists, www.iayt.org.

-
- ⁹³ Karen Pilkington, Graham Kirkwood, Hagen Rampes, and Janet Richardson, "Yoga for Depression: The Research Evidence." *Journal of Affective Disorders* 89 (2005): 13 – 24.
- ⁹⁴ Yael Netz and Ronnie Lidor, "Mood Alterations in Mindful Versus Aerobic Exercise Modes." *Journal of Psychology* 137, no. 5 (September 2003): 405 – 419.
- ⁹⁵ Andreas Michalsen, Paul Grossman, Ayhan Acil, Jost Langhorst, Rainer Ludtke, Tobias Esch, George B. Stefano and Gustav J. Dobos, "Rapid Stress Reduction and Anxiolysis Among Distressed Women as a Consequence of a Three-Month Intensive Yoga Program." *Medical Science Monitor* 11, no. 12 (December 2005): 555 – 561.
- ⁹⁶ Jeremy West, Christian Otte, Kathleen Geher, Joe Johnson and David D. Mohr, "Effects of Hatha Yoga and African Dance on Perceived Stress, Affect and Salivary Cortisol." *Annals of Behavioral Medicine* 28, no. 2 (2004): 114 – 118.
- ⁹⁷ West, and others, 114.
- ⁹⁸ David Watson and Lee Anne Clark, "Development and Validation of the Brief Measures of Positive and Negative Affect: The PANAS Scales." *Journal of Personality and Social Psychology* 54, no. 6 (1988): 1063.
- ⁹⁹ Serge King, *Imagineering for Health: Self-healing through the Use of the Mind* (Wheaton, IL: Quest Books, 1981), 24.
- ¹⁰⁰ Joan Borysenko, *Minding the Body, Mending the Mind* (New York: Bantam Books, 1987), 210.
- ¹⁰¹ Watson and Clark, 1063
- ¹⁰² Richard J. Davidson, "Affective Style and Affective Disorders: Perspectives from Affective Neuroscience." *Cognition and Emotion* 12, no. 3 (1998): 315.
- ¹⁰³ Richard Davidson, Jon Kabat-Zinn, Jessica Schumacher, Melissa Rosenkranz, Daniel Muller, Saki Santorelli, Ferris Urbanowski, Anne Harrington, Katherine Bonus and John Sheridan, "Alterations in Brain and Immune Function Produced by Mindfulness Meditation." *Psychosomatic Medicine* 65 (2003): 564 – 570.
- ¹⁰⁴ Andreas Michalsen, Paul Grossman, Ayhan Acil, Jost Langhorst, Rainer Ludtke, Tobias Esch, George Stefano and Gustav Dobos, "Rapid Stress Reduction and Anxiolysis among Distressed Women as a Consequence of a Three-month Intensive Yoga Program." *Medical Science Monitor* 11, no. 12 (December 2005): 555 – 561.
- ¹⁰⁵ Gloria R. Deckro, Keli M. Ballinger, Michael Hoyt, Marilyn Wilcher, Jeffery Dusek, Patricia Myers, Beth Greenberg, David Rosenthal, and Herbert Benson, "The Evaluation of a Mind/Body Intervention to Reduce Psychological Distress and Perceived Stress in College Students." *Journal of American College Health* 50, no. 6 (May, 2002): 281 – 287.
- ¹⁰⁶ Watson and Clark, 1068.

CHAPTER 3: RESEARCH METHODOLOGY

Introduction

The present research was designed to investigate the following hypotheses as introduced in Chapter One of this dissertation.

Research Hypothesis

Self rated measures of perceived stress as well as positive and negative affect will change significantly in the intervention group of adolescent girls after participation in a six week, yoga based practice of body awareness and intentional relaxation as compared to a control group of adolescent girls.

The Null Hypothesis

Self rated measures of perceived stress as well as positive and negative affect will not change significantly in the intervention group after participation in a six week, yoga based practice of body awareness and intentional relaxation as compared to a control group of adolescent girls.

The focus of the present chapter is to define the methodology utilized in investigating these hypotheses. This chapter will specifically address details involving the following aspects of the study:

- 1) The research design and time table
- 2) The research population
- 3) The dependent variables

- 4) The research intervention or independent variable
- 5) The role of the primary investigator/intervention facilitator
- 6) The research procedures

Research Design

This study utilized a pretest-posttest control group design.¹ The population involved high school juniors from two all girl, Catholic high schools. Juniors from one school participated in the intervention. The control group was comprised of the juniors from the second school. The dependent variables were affect as measured via the Positive and Negative Affect Schedule (PANAS)² and perceived stress as measured via the Perceived Stress Scale (PSS).³ The intervention or independent variable consisted of six, weekly, 50 minute sessions of a yoga based practice of body awareness and intentional rest.

The research design is diagrammed as follows:

Group I (Intervention Group) = High School juniors from school IG
 This group was divided into three groups: one participating in the intervention sessions on Tuesday mornings and two groups participating in the intervention during two consecutive Thursday morning sessions
 Group assignments were prearranged by the high school

Group C (Control Group) = High School Juniors from school CG

O = observations or dependent variable measures
 PANAS and PSS

X = intervention or independent variable

Group I -	O ₁	O ₂	X	O ₃
Group C -	O ₁	O ₂		O ₃

Research Timetable

Two pre-test measures were administered one week apart to establish the consistency of the baseline data. The scheduling of the measures and the intervention were originally scheduled to take place over the course of nine calendar weeks as follows:

- Week 1: O₁ for both Group I and Group C
- Week 2: O₂ for both Group I and Group C
- Weeks 3 – 8: X for Group I only (six intervention sessions)
- Week 9: O₃ for both Group I and Group C

The research schedule was adjusted slightly to accommodate schedule changes in the schools involved in the study. Winter storms required the closing of the schools at least twice during the nine weeks scheduled for the research. As a result the study was extended to occur over ten calendar weeks. The following changes were made in the research time table.

- Week 1: O₁ for both Group I and Group C
- Week 2: O₂ for both Group I and Group C
- Weeks 3 - 8: X for Group I (Thursday groups only)
- Week 9: X for Group I (Due to an ice storm, school was cancelled on one of the Tuesdays scheduled for the intervention. As a result, the Tuesday group intervention became six sessions over seven weeks, rather than six sessions in six weeks)
- Week 9: O₃ for both Group I (Thursday groups only)
- Week 10: O₃ for Group I (Tuesday group)
O₃ for Group C

Research Population

The population samples involved in this research were drawn from two similar all girl, Catholic high schools both located in the Greater Cincinnati metropolitan area. All participants were high school juniors. Participants for the intervention group were taken from one school (labeled school IG previously) and participants for the control group were taken from the other (school CG).

Intervention Group

The population for the intervention group consisted of junior class members from an all girl, college preparatory, Catholic high school. The school's enrollment is approximately 600 students, with a 14:1 student teacher ratio. 100% of the 2006 graduating class were accepted into post-secondary educational institutions.⁴

The six week intervention replaced a study hall period at some point in the school year for the majority of the junior class. The 143 juniors were divided into smaller sections meeting on Tuesdays and Thursdays for study hall or community service, depending on the semester. In the first semester of the 2006/2007 academic year, approximately 50 juniors participated in the six weekly intervention sessions as part of their scheduled study hall period for that semester. The remainder of the junior class (minus approximately 20 juniors assigned to advanced placement honors coursework) participated in a community service requirement during the Tuesday and Thursday sessions of the first semester.

Table 3: Intervention Group Eligibility

	Study Hall (included six intervention sessions)	Community Service
Semester One	Juniors not eligible for research	Juniors eligible for research
Semester Two	Juniors eligible for research	Juniors not eligible for research

The research was conducted during the second semester of the 2006/2007 school year. At this time, the two halves of the junior class switched so that the groups who participated in community service during the first semester now participated in study hall and the groups scheduled for study hall during the first semester now participated in community service. Only the juniors scheduled for study hall (and thus the six intervention sessions) during the second semester were eligible to participate in the research. During the second semester, one group participated in the yoga based intervention on Tuesday mornings. The other two study groups participated in the yoga based intervention on Thursday mornings in two consecutive sessions.

Inclusion Criteria: The entire junior class of School IG (with the exception of a few students who participated in honors programs) participated in the six-week intervention at some point during the 2006/2007 academic year. Half of the juniors, 75 girls total, were eligible for participation in the study as they were scheduled to participate in the six week intervention during the second and last semester of the school year. Two of these girls obtained permission from the school administration to opt out of the six week intervention. Of those eligible, only the girls who returned signed parental

consent forms and signed assent forms ($n = 47$) were included in the study. The consent and assent forms are included in an appendix ([Appendix D](#)) to this document.

Exclusion Criteria: Students who participated in the intervention during the first semester of the school year were not eligible for participation in the research. Students who participated in the advanced placement honors coursework, rather than study halls, were excluded from the eligibility to participate as part of the research. Of the remaining juniors, students who have not returned signed consent and assent forms to their teacher were excluded from participation in the study but still participated in the six yoga based intervention sessions. While participation in the six yoga based sessions of body awareness and intentional relaxation were part of the junior year curriculum for everyone except those in the honors program, participation in the research data collection was completely voluntary for those eligible students.

Control Group

The control group population consisted of juniors from a separate all girl, Catholic High School. Approximately 780 girls are enrolled in this high school and it is staffed by 50 faculty members.⁵

In exchange for participation in the research as a control group, two 45 minute, stress management workshops were offered after completion of the study to the juniors who volunteered to participate in the research. These stress management workshops were offered during the regularly scheduled study hall periods. Be it noted that the second stress management workshop was cancelled due to the eligible juniors expressing a preference for their study hall period on the day of the workshop. The juniors felt they had too much work to do and needed the study hall time to finish school related tasks. A

stress management workshop was committed for presentation to the faculty of the high school during the academic year following the research study as a means of compensation for the junior class participation in the study.

Inclusion Criteria

Juniors who had a weekly study hall period during the second semester were eligible for inclusion in the research as part of the control group. Only the juniors who returned consent and assent forms ($n = 40$) were included in the study. The consent and assent forms are included in an appendix ([Appendix D](#)) to this document.

Exclusion Criteria

Of the eligible juniors, those who did not return signed assent and consent forms to their study hall teacher were excluded from participation in the research as part of the control group.

Potential Risks for the Research Population

There were no risks associated with participation in the six week intervention, nor were there risks involved in completing dependent variable data forms, the PANAS and PSS forms. This was conveyed verbally to both the control and intervention groups in public presentations introducing the study to the girls. It was also restated in both the assent and consent forms.

Discontinuation Option for Research Participants

Research participants were free to discontinue participation at any point in time without consequence. This was stated verbally to both the control and intervention groups in public presentations introducing the study to the juniors. It was also restated in both the assent and consent forms.

Institutional Review Board

All procedures involving research participants were approved by the Institutional Review Board (IRB) of Holos University Graduate Seminary in November, 2006. Quarterly updates were presented to the IRB for approval as well.

Dependent Variable Measures

The dependent variables of affect and perceived stress were measured by the Positive and Negative Affect Schedule (PANAS) and the Perceived Stress Scale (PSS) respectively.

Positive and Negative Affect Schedule (PANAS)⁶

The PANAS scale consists of 10 adjectives for the negative affect (NA) dimension (distressed, upset, hostile, irritable, scared, afraid, ashamed, guilty, nervous, jittery) and 10 adjectives for the positive affect (PA) dimension (attentive, interested, alert, enthusiastic, excited, inspired, proud, determined, strong, active). Research participants were asked “to rate the extent to which they have experienced each particular emotion within a specified time period, with reference to a 5 – point scale. The scale point[s] are: 1 ‘very slightly or not at all’, 2 ‘a little’, 3 ‘moderately’, 4 ‘quite a bit’ and 5 ‘very much.’”⁷ The popularity of the PANAS instrument is attributed to its brevity and its applicability in accessing self reported mood over various time frames. In this study, the PANAS scale was stated so as to measure affect “during the past week.” The PANAS scale is presented in an appendix ([Appendix G](#)) to this text. An estimate of five to seven minutes was required to complete the scale.

Scoring Procedure

The rated numbers listed by the study participants were totaled to obtain an overall score. There were two separate tallies, one for NA and one for PA. Each study participant then had one NA score and one PA score, both derived from data collected via the PANAS scale.

PANAS Reliability

The alpha reliabilities reported for the PANAS scale are high. They range from .83 to .90 for the Positive Affect scale and from .85 to .90 for Negative Affect.⁸

Perceived Stress Scale (PSS)⁹

The PSS is the “most widely used psychological instrument for measuring the perception of stress.”¹⁰ It consists of fourteen statements such as “In the last month, how often have you felt confident about your ability to handle your personal problems?” “PSS items were designed to tap the degree to which respondents found their lives unpredictable, uncontrollable, and overloading. These three items have been repeatedly found to be central components of the experience of stress.”¹¹ The study participants were asked to indicate how often they have felt this way according to a scale from 0 (never) to 4 (very often). The PSS is presented in an appendix ([Appendix G](#)) to this text. The scale was estimated to take 5 - 7 minutes to complete.

Scoring Procedure

Scoring of the PSS was done by reversing the scores on the seven positive statements (statements 4, 5, 6, 7, 9, 10, and 13 on the PSS form). Therefore a 0 response equals 4, 1 equals 3, 2 equals 2, 3 equals 1, and 4 equals 0 on these seven statements. The scores for all 14 statements then were summed to provide one overall score for the

measurement. According to the researchers who developed the PSS, this measure is not intended as a diagnostic assessment tool. There are no classifications or cut-off's for high or low perceived stress levels. The PSS is used solely as a between- and within-subject comparative measure.¹²

PSS Reliability

The coefficient reliabilities for the PSS were reported as ranging from .84 to .86.¹³

Independent Variable

The independent variable or research intervention for this study consisted of six, weekly, 50 minute, yoga based sessions of body awareness and intentional relaxation. The terms integral to the intervention are defined in Chapter One of this text.

Intervention Objectives

The intervention was designed to allow the participants:

- To experience a variety of techniques for body awareness and intentional relaxation while discerning the personal benefits and usefulness of each.
- To experience the physical, mental, emotional and spiritual effects of regularly setting aside time for non-judgmental awareness and intentional rest.

A conceptual model used to further explain the goals of the intervention sessions is presented in an appendix ([Appendix C](#)) to this text. Each of the six sessions included breathing techniques, gentle stretching, and relaxation exercises. The sessions evolved over the six weeks to build on what had been experienced in earlier sessions and to include areas of interest expressed by the students and their teachers. Sessions were physically gentle and tailored to the needs and abilities of the participants. The students were encouraged to do only what felt appropriate for them, and to rest when necessary.

While the specific techniques experienced in each session varied, the format for each session was consistent as follows:

Session Format

1) Becoming Present (10 minutes)

This portion of the session consisted of a resting posture designed to relax the body combined with gentle breathing techniques to quiet and calm the mind. The resting posture used for this portion of the session was a classic yoga posture called savasana in Sanskrit and commonly referred to as the “sponge position.” It involves lying supine on the floor with the legs extended and the arms resting next to the body with the palms facing upward.¹⁴ The girls were encouraged to adjust the position to ensure the body was comfortable and able to relax deeply. Suggested adjustments included bending the legs at the knees and placing the feet on the floor to release low back tension, or placing something under the back of the head to encourage softness in the muscles of the neck and chest. The focus of this portion of each session was to become fully present; intentionally releasing physical and mental distraction. Breathing techniques practiced during this time included diaphragmatic breathing,¹⁵ counted diaphragmatic breathing,¹⁶ and full yoga breathing.¹⁷

2) Gentle stretching (30 minutes)

This portion of each session consisted of gentle stretches and movements designed to facilitate body awareness in a non-judgmental atmosphere of self care, nurturance, love and acceptance. Students were encouraged to do only what was comfortable for them. Their attention was continually drawn toward inward reflection and non-judgmental observation of their experience rather than outward comparison and

goals. Students were encouraged to only to 50% of what they thought they could do in order to encourage the body to remain relaxed and “ease-ful.” The focus of this portion was to practice being present in a non-critical way with themselves, their bodies, their thoughts and emotions; and to experience yoga based, self care measures for releasing physical and mental tension.

3) Intentional Relaxation (10 minutes)

The focus of this portion of each session was to practice deep and intentional relaxation. Students assumed a comfortable resting position (typically savasana as described earlier) while being verbally guided through a relaxation technique. During one session, the participants were offered an optional resting position called the positive rest position¹⁸. This position involves lying supine on the floor with the knees bent and the calves resting on the seat of a chair. This posture was offered as an option for the students who specifically asked what might be helpful in cases of occasional low back discomfort.

The guided relaxation techniques utilized during this portion of the sessions included autogenic training¹⁹, Hawaiian breathing practices called pikopiko²⁰, progressive relaxation²¹, an energetic balancing technique²², visualization²³ and counting backwards from 10 to 1²⁴. Examples of the relaxation techniques utilized in the intervention sessions can be found in [Appendix I](#).

Session Content

Each session included an introduction of new techniques building upon the previous sessions. The intervention was not intended to provide a “cookie-cutter” formula for the girls as a mandate for rehearsal each week. The objective of the

intervention was to allow the girls to experience various options for body awareness and intentional relaxation while encouraging them to discern the benefits and appropriateness of each for themselves. The philosophical milieu from which the intervention techniques were presented is contained within the appendix section ([Appendix B](#)) of this text, and represents a chapter of a book on these techniques authored by the study's primary investigator/intervention facilitator. A list of the specific techniques done in each session along with comments from the PI/facilitator is also in the appendix ([Appendix H](#)) of this text.

Physical Setting

Sessions were held in the school IG gym. Lighting in the room was dimmed and soft ambient music was played to create an atmosphere of respectful, soothing quiet. Yoga "sticky" mats were provided by the school for the girls. The girls were instructed to bring clothing appropriate for comfort, warmth and freedom of movement for the sessions.

Session Recordings

Sessions were digitally recorded and made available at the completion of the study. The recordings were hand delivered to the faculty member who served as the primary contact for the study's PI. Students and parents who were interested could practice at home by requesting a copy of the sessions from the school faculty. Of the eighteen individual sessions that made up the intervention (three groups of juniors/six sessions each), only 15 were recorded due to equipment malfunction. As each of the six sessions was repeated for the three groups (Tuesday group and two Thursday groups), at least one recording of each of the six sessions was obtained.

The Intervention as School Curriculum and Option for Non-Participation

The six week yoga based practice was incorporated as part of the curriculum at the participating high school, replacing a study hall period for the high school juniors at some point in the school year. This was the first time a series of this type and duration had been incorporated into the school's curriculum. As per the requirements of the Catholic Diocese governing the school involved in the research, a teacher from the high school was present for each yoga based session. If a student felt unable to participate in a session, she had the option of informing the faculty member present and then, observing rather than participating during that particular session. This option was announced to the students along with reassurance that selecting to do so would not impact their grades in any way. This non-participation option was also stated in the consent and assent forms signed by both the parents and the juniors. During the sessions, participants had the option of non-participation without consequence for specific techniques or procedures that they felt were inappropriate for them. These types of choices were encouraged, as it provided evidence that the girls were aware of their personal preferences and limitations (be they physical, mental, emotional or spiritual), and that they were honoring themselves in the present moment. At times during the sessions, students fell asleep in a relaxed position. While sleeping was not encouraged, the students were not disturbed.

While the yoga based sessions were part of the curriculum, participation in the research data collection was completely voluntary. Consent forms signed by the parents and assent forms signed by the girls were obtained for students who chose to participate in the study.

Role of the Primary Investigator/Intervention Facilitator

The intervention was facilitated by the primary investigator (PI) for the study. Nancy L. Bloemer is a Registered Yoga Teacher through the national Yoga Alliance. At the time of the study, she had 20 years professional experience teaching yoga and stress management techniques. She maintained profession liability insurance for yoga instruction throughout the study time frame. While none of the study participants had previously participated in a yoga based session taught by the study's PI, several of the girls knew of the PI as she lived locally and knew several of their parents. She also appeared monthly on a local cable television show demonstrating various self care measures based in yoga.

The school and the regional Catholic Diocese to which it answers, requires that all volunteers, faculty and staff interacting with students of Catholic schools participate in a training program called VIRTUS training. The PI for the study completed these requirements, as recorded by the Diocese. The Diocese requires that regular updates to this training be completed and registered via the internet with the Diocese in order to maintain the right to interact with students in the Catholic school system. The PI's records were kept current in accordance with these requirements.

Experimenter Bias

Intervention Group Identity

Information regarding which juniors were involved in the research study was not made available to the primary investigator/intervention facilitator (PI) during the course of the study. A teacher from the intervention group high school maintained the list of the girls involved in the study. The PI facilitated the six-week series for the entire junior

class as part of the school year curriculum but was not privy to information regarding the girls' identities or which girls were participating in the data collection. The identity of the girls participating in the research was further concealed from the PI via the use of codes rather than names on the dependent variable forms. (The instructions for the coding of the forms can be found in [Appendix G](#).) Dependent variable measurement forms were administered by a high school teacher. The PI was not present while the intervention group participants completed these forms.

Control Group Identity

A list of the juniors agreeing to participate in the research as a control group was maintained by the PI and supervised by the study hall teacher for the control group high school. The study hall teacher supervised the distribution and collection of the data forms at the control group high school site. The forms were distributed and collected by the PI as directed by the study hall teacher during regularly scheduled study hall periods. The identities of the students were concealed from the PI via the use of codes rather than names on the forms. Through the duration of the ten week research timetable, the only interaction between the PI and the control groups was during the study hall periods when the data was collected.

Procedures

Intervention Group Procedures

Intervention Group School Recruitment

A meeting was scheduled with the principal of the intervention group high school just prior to the beginning of the 2006/2007 academic year. The principal embraced the opportunity to introduce the students to the techniques offered via the intervention. It

was through mutual agreement between the school's principal and the study's PI that the junior class was selected for the research population. Convenience of scheduling and availability provided the primary rationale for the selection of the juniors over the other high school classes.

The school's principal felt that the intervention offered a perfect complement to the active and often hectic schedule of the students. She reasoned that if the students were given an option of either participating in the six weekly intervention sessions or participating in study hall, the majority of the students would choose study hall. The principal, therefore, changed the curriculum for the junior class by replacing six weeks of study hall with the intervention. This decision was announced by the principal at the junior parent meeting held prior to the beginning of the school year.

Intervention Group Faculty Involvement

The primary faculty contact was the director of the Theology Department. As the coordinator of the study hall periods involved, she made the final decisions regarding which groups of juniors participated in the intervention during which semesters. The rationale for group assignment was based on pre-arranged 2006/2007 class schedules. This faculty member served as the primary contact for the PI throughout the school year. She distributed and collected the assent and consent forms. She maintained the list of juniors participating in the research. She also administered the dependent variable measurements during study hall periods to the appropriate students. She was present during and participated in the Tuesday morning intervention sessions. According to school policy, attendance was taken at each session by a faculty member.

Intervention Group Parent Involvement

The parents of the juniors eligible for the study first learned of the six week intervention and the related research in the junior parent meeting held in the week prior to the beginning of the school year. Parents were informed during this meeting by the school's principal that the yoga based practice of body awareness and intentional relaxation was replacing study hall for a six week period at some point during their daughter's junior year. The parents were reminded of the six week intervention and the opportunity for involvement in the related research via the consent forms (see [Appendix D](#)) sent home with the juniors just before the completion of the school's first semester. At this point in time, the two groups of juniors (not eligible for the research as explained earlier) had completed the six intervention sessions. The consent forms reminded the parents of the inclusion of six week intervention into their daughter's junior year curriculum and asked permission for their daughter's participation in the associated data collection. The consent forms included information regarding anonymity of the scores and non-participation without consequence options.

Intervention Group Participant Involvement

A presentation was made by the PI to the junior class during the first week of the school year. An outline of that presentation is included in an appendix ([Appendix E](#)). Two week prior to the beginning of the second semester, consent and assent forms were distributed to the members of the junior class scheduled to participate in the six week intervention during the second semester. In a five minute presentation, the PI reminded the junior class about the presentation given in the beginning of the school year regarding

the opportunity to be involved in the research. Only the juniors who returned the consent and assent forms to their teacher were included in the data collection.

Control Group Procedures

Control Group School Recruitment

Telephone contact to explain the research was first made with the school nurse of the control group high school. The research was conveyed to the school's principal who provided approval to approach members of the junior class who had regularly scheduled study halls during the second semester. The principal requested that a stress management workshop be presented to the school's faculty in exchange for the school's participation in the research. The workshop was committed to take place as part of the 2007/2008 school year. The PI agreed to this stipulation and asked that the same type of presentation be made available to the students volunteering for the study. It was agreed that such a presentation would replace one study hall period for the juniors who expressed interest in participating.

Control Group Parent Involvement

Parents of the control group juniors learned of the research via the consent forms. These forms were distributed to the parents by way of the juniors two weeks prior to the beginning of the data collection. The control group consent forms are represented in [Appendix D](#).

Control Group Participant Involvement

Eligible juniors for the control group were distributed between two study hall periods, one meeting on Wednesday mornings and the other meeting on Friday mornings. A brief presentation explaining the research and their requested participation in it was

made to both groups. Juniors who were interested were given consent and assent forms at that time ([see Appendix D](#)).

Procedural Documentation

Documents relative to research protocol outlined in this chapter are to be found in the appendix of this text, including:

- Assent and Consent forms for both the intervention and control groups
- A copy of the PANAS scale form
- A copy of the PSS form
- The instructions for the coding of data forms
- Excerpts from a book authored by the study's PI
- A listing of techniques utilized in each intervention session accompanied by the subjective comments of the PI
- The agenda from the introductory presentation made to the intervention group participants

Chapter 3 Endnotes:

-
- ¹ Alan E. Kazdin, *Research Design in Clinical Psychology, Fourth Edition*. (Boston: Allyn and Bacon 2003), 162 – 164.
- ² David Watson and Lee Anna Clark, “Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS scales.” *Journal of Personality and Social Psychology* 54, no. 6 (1988): 1063 – 1070.
- ³ Sheldon Cohen, Tom Kamarck, and Robin Mermelstein. “A Global Measure of Perceived Stress.” *Journal of Health and Social Behavior* 24 (December, 1983): 385 – 396.
- ⁴ College profile sheet for school IG.
- ⁵ College profile sheet for school CG.
- ⁶ Watson and Clark, 1063 – 1070.
- ⁷ John R. Crawford and Julie D. Henry, “The Positive and Negative Affect Schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample.” *British Journal of Clinical Psychology* 43 (2004): 250.
- ⁸ David Watson and Lee Anna Clark, *The PANAS-X: Manual for the Positive and Negative Affect Schedule – Expanded Form*. (University of Iowa, 1994): 5.
- ⁹ Cohen, Kamarck and Mermelstein, 385 – 396.
- ¹⁰ Mind Garden, Inc., www.mindgarden.com
- ¹¹ Cohen, Kamarck, and Mermelstein, 387.
- ¹² Laboratory for the Study of Stress, Immunity and Disease. Carnegie Mellon University, Department of Psychology, <http://www.psy.emu/~scohen/reprint.html>
- ¹³ Cohen, Kamarck and Mermelstein, 390.
- ¹⁴ Nancy Bloemer. *The Now River: Practical Techniques for Living in the Present Moment*. (Covington, KY: Now River Publications, 2003), 30 – 37.
- ¹⁵ Bloemer, 43 – 49.
- ¹⁶ Bloemer, 61 – 63.
- ¹⁷ Bloemer, 50 – 54.
- ¹⁸ Bloemer, 37 – 39.
- ¹⁹ Caroline Myss and Norm Shealy. *The Science of Medical Intuition: Self-Diagnosis and Healing with Your Body’s Energy Systems, Study Guide*. (Boulder, CO: Sounds True, 2002), 9.
- ²⁰ Serge Kahili King. *Instant Healing*. (Los Angeles: Renaissance Books, 2000), 136 – 138.
- ²¹ Bloemer, 219 – 221.
- ²² Bloemer, 242 – 244.
- ²³ Bloemer, 245 – 247.
- ²⁴ Bloemer, 206 – 208.

CHAPTER 4: RESEARCH FINDINGS

The statistical results of the present research are presented in this chapter. Specifically, the data collection, selected statistical analysis and numeric results will be discussed.

Data Collection

Two separate sets of baseline data (Observation 1 [O₁] and Observation 2 [O₂]) were collected on both the intervention and the control groups prior to the implementation of the six week intervention. These data sets were collected one week apart, with the last set (O₂) being collected one week prior to the beginning of the six week intervention. A third data set (O₃) was collected one week after the completion of the six weekly intervention sessions. The timetable and procedures for the data collection can be found in the previous chapter of this text.

Each data set, consisting of two measures, the Perceived Stress Scale (PSS) and the Positive and Negative Affect Schedule (PANAS), resulted in three scores for each participant in the study: a PSS score, a PA (positive affect) score, and an NA (negative affect) score.

Missing Data Values

Data forms were sometimes incomplete with specific statements on the PSS or words on the PANAS not filled in. When this occurred, a score for that particular aspect (PSS, PA or NA) of the observation was not recorded in the database. Thus, a single observation may have resulted in one PSS score, one NA score and no PA score for example. The data was entered as such. Sometimes two responses were selected for a

single statement or word. In these instances, no score was recorded for that particular aspect of the observation. As a result, the total numbers for each observation vary slightly.

Statistical Analysis

Statement of the Null and Research Hypotheses

The null hypotheses state that the mean scores for each measure over time will not differ between the intervention group (IG) and the control group (CG). The formulas can be expressed as:

$$H_0: \text{Mean}_{IG} (\text{PSS1, PSS2, PSS3}) = \text{Mean}_{CG} (\text{PSS1, PSS2, PSS2})$$

$$H_0: \text{Mean}_{IG} (\text{PA1, PA2, PA3}) = \text{Mean}_{CG} (\text{PA1, PA2, PA3})$$

$$H_0: \text{Mean}_{IG} (\text{NA1, NA2, NA3}) = \text{Mean}_{CG} (\text{NA1, NA2, NA3})$$

The research hypotheses state that the mean scores for each measure over time will be different between the intervention group (IG) and the control group (CG). The formulas for the research hypotheses can be expressed as:

$$H_1: \text{Mean}_{IG} (\text{PSS1, PSS2, PSS3}) \neq \text{Mean}_{CG} (\text{PSS1, PSS2, PSS2})$$

$$H_2: \text{Mean}_{IG} (\text{PA1, PA2, PA3}) \neq \text{Mean}_{CG} (\text{PA1, PA2, PA3})$$

$$H_3: \text{Mean}_{IG} (\text{NA1, NA2, NA3}) \neq \text{Mean}_{CG} (\text{NA1, NA2, NA3})$$

Alpha Value

The level of significance for the statistical analyses was set at .05.

Statistical Test

Data analysis was performed by Dr. Paul Thomlinson, a faculty member of Holos University Graduate Seminary, utilizing using SPSS 15.0 version software. A two factor

mixed design analysis of variance (ANOVA)¹ was used for each of the dependent variable measures, specifically PSS, PA and NA. The ANOVA resulted in an F value for each measure. The F value is defined as “a ratio of the mean sums of squares due to between-group differences over the mean sums of squares due to within-group differences.”²

Obtained Values

Perceived Stress Scale (PSS)

A significant interaction effect was noted in only one dependent variable measure over time, the PSS scores. The mean scores of the intervention group changed significantly over time as compared to the mean scores for the control group.

$$F_{(2,77)} = 3.871, p < .05$$

The mean values are as follows:

Table 4: Mean Scores for Perceived Stress Scale

Measure	Group	Mean	Std. Deviation	Number
PSS1	Intervention group	29.95	5.839	42
	Control group	32.22	6.412	37
	Total	31.01	6.180	79
PSS2	Intervention group	30.19	5.977	42
	Control group	30.68	7.546	37
	Total	30.42	6.717	79
PSS3	Intervention group	28.74	7.184	42
	Control group	33.32	6.803	37
	Total	30.89	7.334	79

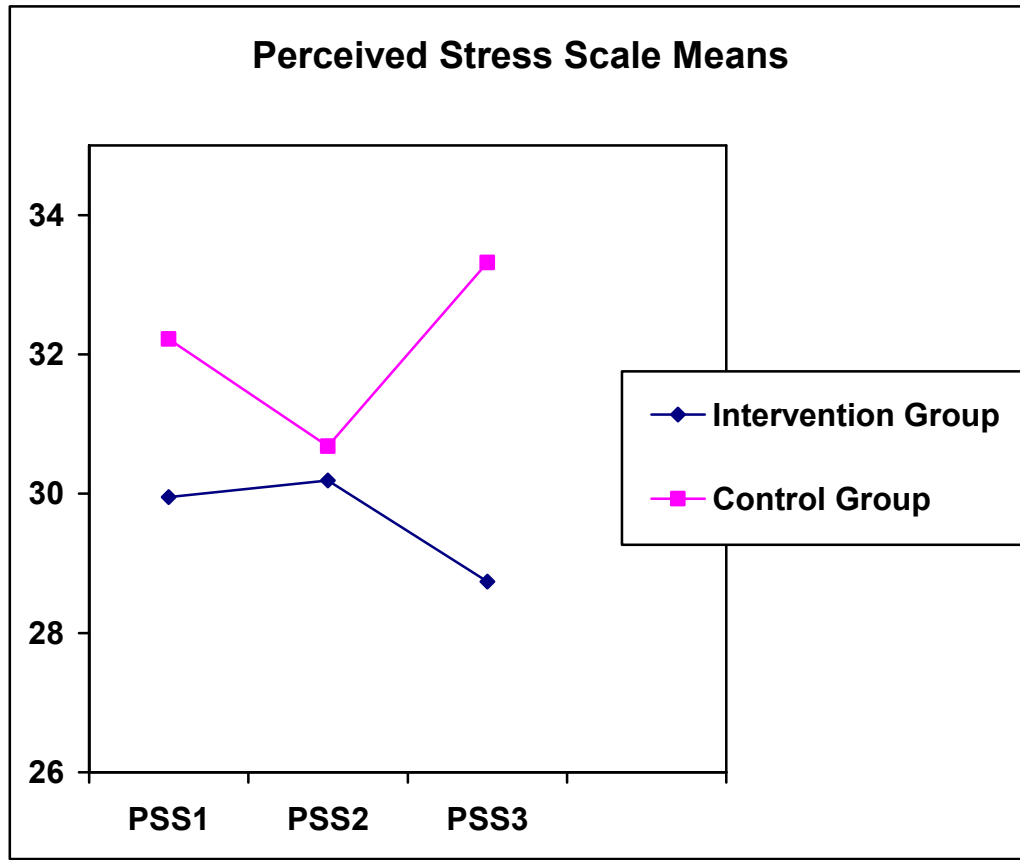


Figure 1: Perceived Stress Scale Means

The mean PSS scores for the intervention group were significantly lower after completion of the six intervention sessions. The PSS scores for the control group increased over the same time frame.

Positive Affect (PA)

The mean PA scores for the control group remained consistent over the time of the study. While the mean score for PA increased in the intervention group before and after the six intervention sessions, the change was not statistically significant.

$$F_{(2,79)} = 1.933, p > .05$$

The mean values are as follows:

Table 5: Mean Scores for Positive Affect

Measure	Group	Mean	Std. Deviation	Number
PA1	Intervention group	29.80	6.458	44
	Control group	29.78	6.609	37
	Total	29.79	6.486	81
PA2	Intervention group	28.80	6.719	44
	Control group	30.08	6.808	37
	Total	29.38	6.748	81
PA3	Intervention group	31.61	7.695	44
	Control group	29.81	7.486	37
	Total	30.79	7.607	81

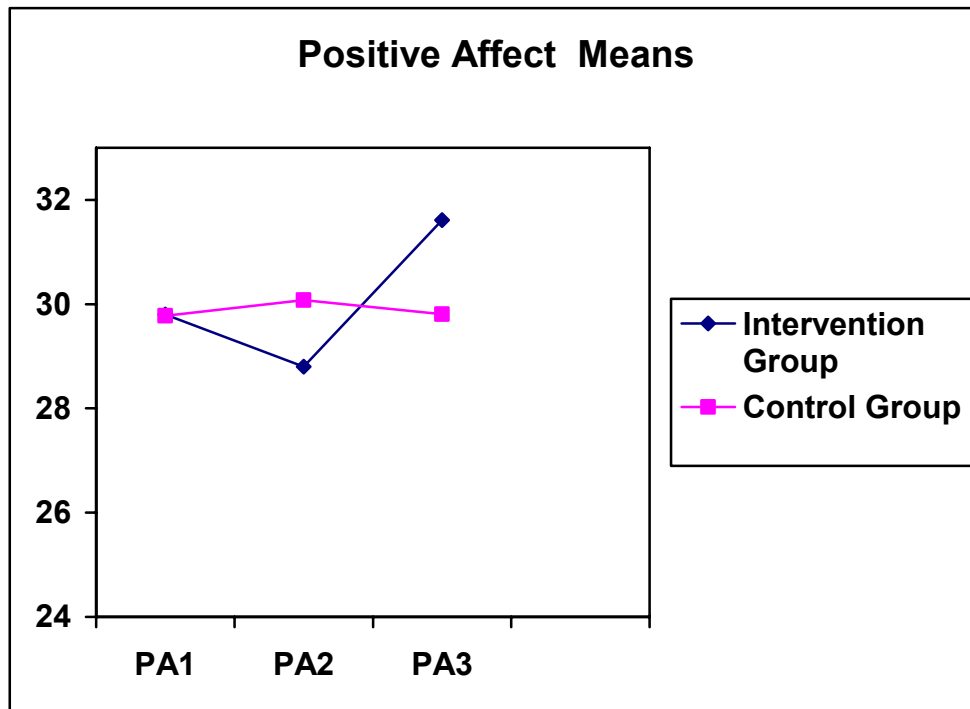


Figure 2: Positive Affect Means

Negative Affect (NA)

Mean NA scores remained consistent over time within the control group. The NA scores of the intervention group did indeed decline after the completion of the six intervention sessions; however, the change was not statistically significant.

$$F_{(2,85)} = .676, p > .05$$

The mean values are as follows:

Table 6: Mean Scores for Negative Affect

Measure	Group	Mean	Std. Deviation	Number
NA1	Intervention group	25.72	6.213	47
	Control group	25.73	6.898	40
	Total	25.72	6.498	87
NA2	Intervention group	25.64	7.001	47
	Control group	25.98	6.443	40
	Total	25.79	6.714	87
NA3	Intervention group	24.06	5.947	47
	Control group	25.65	8.072	40
	Total	24.79	7.007	87

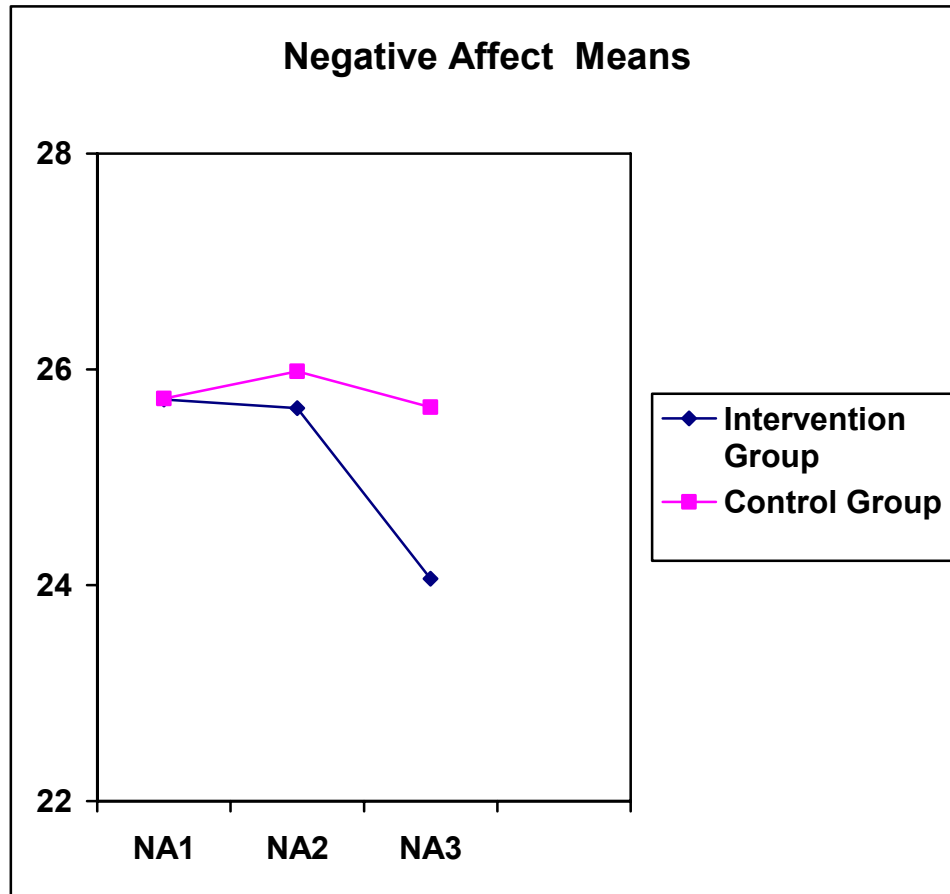


Figure 3: Negative Affect Means

Additional Data Analyses

The research hypotheses specify an anticipated change in the dependent variable measures after six sessions of a yoga based practice of body awareness and intentional relaxation. Some of the students in the intervention group were absent from school on various days of the scheduled intervention. These absences were recorded by the school faculty member present at each intervention session. Interestingly, when the scores of the students who missed more than one of the six sessions were filtered from the data analyses significant changes were noted in the research results.

Perceived Stress Scale (PSS)

The change in the PSS scores for the intervention group is more dramatic when the scores of the students who missed more than one of the six sessions were removed from the analysis. The significance level drops from .025 (all participants included) to .003.

$$F_{(2,70)} = 6.120, p < .05$$

The mean values are as follows:

Table 7: Mean Scores for Perceived Stress Scale with Absence Filter

Measure	Group	Mean	Std. Deviation	Number
PSS1	Intervention group	30.52	5.931	25
	Control group	32.22	6.412	37
	Total	31.53	6.230	62
PSS2	Intervention group	31.04	5.342	25
	Control group	30.68	7.546	37
	Total	30.42	6.717	79
PSS3	Intervention group	27.68	7.403	25
	Control group	33.32	6.803	37
	Total	30.89	7.334	79

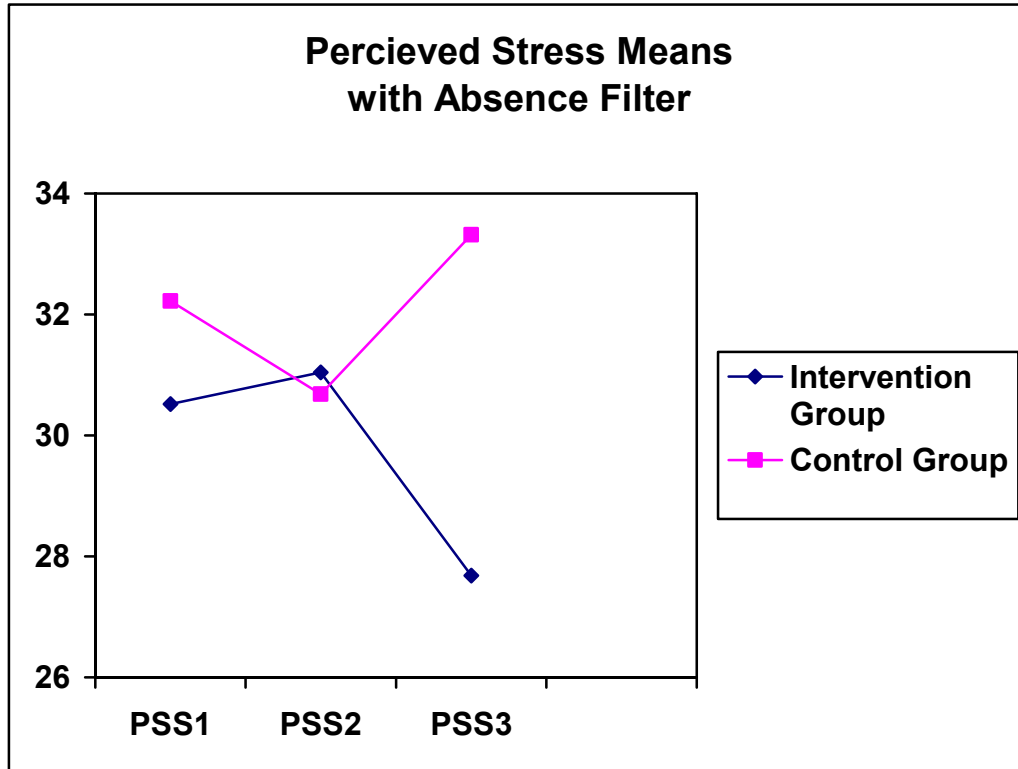


Figure 4: Perceived Stress Scale Means with Absence Filter

Positive Affect (PA)

The change noted in the mean PA scores of the intervention group were statistically significant when the scores of the students who missed 2 or more of the six intervention sessions were removed from the data analysis. The significance level of .148 noted in the total intervention group dropped to .042 when scores of students with more than one absence are filtered from the analysis. The power of the statistical analysis is reduced however, as the total number in the intervention group drops to 28.

$$F_{(2,73)} = 3.239, p < .05$$

The mean values are as follows:

Table 8: Mean Scores for Positive Affect with Absence Filter

Measure	Group	Mean	Std. Deviation	Number
PA1	Intervention group	28.14	6.370	28
	Control group	29.78	6.609	37
	Total	29.79	6.486	81
PA2	Intervention group	28.11	6.202	28
	Control group	30.08	6.808	37
	Total	29.38	6.748	81
PA3	Intervention group	31.86	7.821	28
	Control group	29.81	7.486	37
	Total	30.79	7.607	81

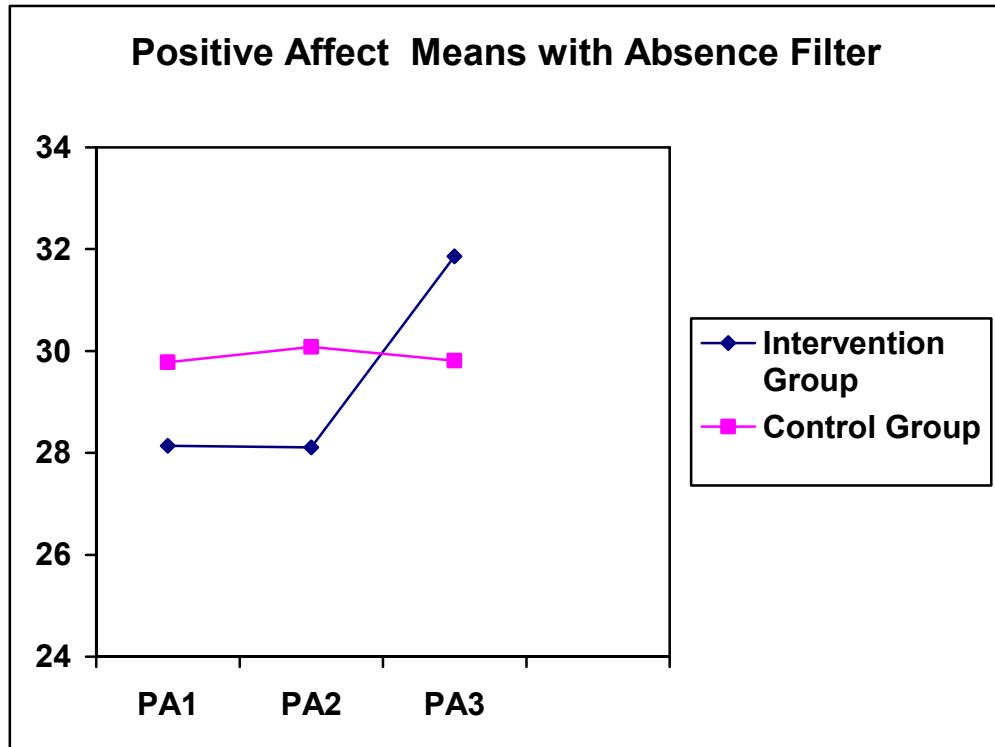


Figure 5: Positive Affect Means with Absence Filter

Negative Affect (NA)

No significant change in mean NA scores was noted when the scores of the students who missed more than one intervention session were filtered from the data analysis. The significance level dropped only slightly from .510 for all research participants to .305 omitting scores of students with 2 or more absences. The number of NA scores in the intervention group is reduced to 30 when the absences filter is applied.

$$F_{(2,78)} = 1.198, p > .05$$

The mean values are as follows:

Table 9: Mean Scores for Negative Affect with Absence Filter

Measure	Group	Mean	Std. Deviation	Number
NA1	Intervention group	26.27	5.971	30
	Control group	25.73	6.898	40
	Total	25.72	6.498	87
NA2	Intervention group	25.53	7.026	30
	Control group	25.98	6.443	40
	Total	25.79	6.714	87
NA3	Intervention group	23.23	6.328	30
	Control group	25.65	8.072	40
	Total	24.79	7.007	87

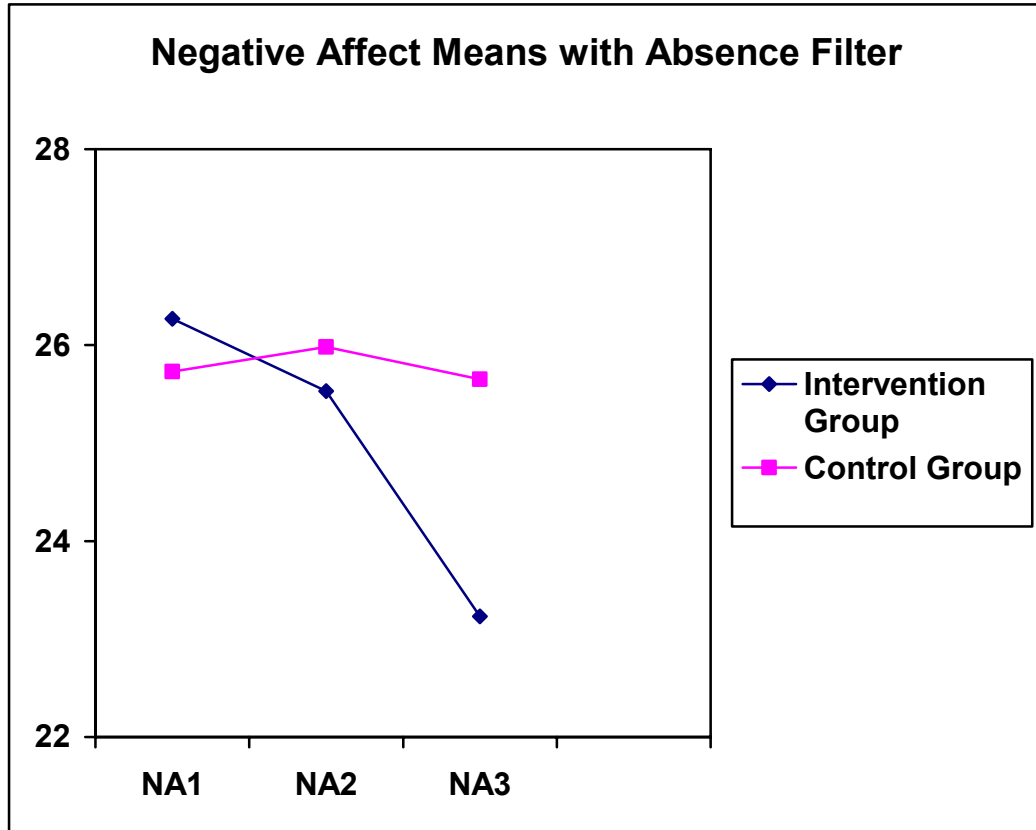


Figure 6: Negative Affect Means with Absence Filter

Summary

Using mixed design ANOVA analyses with an alpha value set at .05, only the Perceived Stress Scale scores of the intervention group resulted in statistically significant changes over time in this study. When a filter was applied to the analyses removing scores of the students from the intervention group who were absent from 2 or more of the six intervention sessions, Perceived Stress Scale scores and Positive Affect Scores changed significantly over the course of the research timeline. The statistical power of the analysis was reduced when the scores of the students who missed intervention sessions were removed from the data.

Chapter 4 Endnotes:

¹ Perry Hinton, *Statistics Explained: A Guide for Social Science Students*. (New York: Routledge, 2003), 177 – 187.

² Neil Salkind, *Statistics for People who “Think They” Hate Statistics, Second Edition*. (Thousand Oaks, CA: Sage Publications, Inc., 2004), 202.

CHAPTER 5:

DISCUSSION

*There are no facts, only interpretations.
~ Friedrich Nietzsche*

Introduction

The progression of this dissertation has moved from a historical perspective of the present research inquiry, to detailing the design and protocol of the present research, and then to reporting its statistical results. The focus of this chapter will be a discussion of the implications of the present research within the context of the larger body of literature from which it was conceptualized.

Summary of Results

As compared to a control group, self rated scores of adolescent girls after participating in the intervention involving yoga based sessions of body awareness and intentional relaxation showed:

- Significant reduction in perceived stress levels
- No significant difference in positive affect scores
- No significant difference in negative affect scores

When the scores of the students who had missed more than one of the six intervention sessions were removed from the statistical analysis, the results showed:

- Significant reduction in perceived stress levels
- Significant elevation of positive affect scores
- No significant difference in negative affect scores

It would appear then, that the intervention is an effective self care tool for this sample of adolescent girls if reduction of perceived stress levels is the desired outcome. The intervention, however, impacted positive affect only when the young women in this study participated in five or more sessions. The intervention showed no significant influence on negative affect in this group of young women even when they participated in all six intervention sessions.

Discussion of the Results

The intervention in this research may be said to have significantly improved perceived stress scores as measured by PSS in the intervention group of adolescent girls while having no impact on affect (positive or negative) as measured by PANAS. Thus, the hypotheses in this study as stated in previous chapters were only partially supported by the data.

Perceived Stress Scale

The results of the present study strengthen previous research regarding the effectiveness of yoga¹ and yoga based practices² as mechanisms for reducing perceived stress scores. One of the numerous potential explanations for the consistency of this finding is offered in discussion of a study involving yoga and chronically ill adults. “Although many yoga asanas are demanding, practitioners usually notice improved flexibility during the course of a single class, potentially providing chronically ill people with an experience of somatic control and increased feelings of efficacy and hope.”³ Those feelings experienced through participation in yoga based postures translate in the literature into a consistent decrease in the PSS scores, a measure of how one perceives their life as “unpredictable, uncontrollable, and overloading.”⁴

While the present research served to support previous studies into yoga based practices, it added to current understanding in the applicability of these types of self care measures to a population of adolescent girls. Also significant, was that the intervention was included into daily academic activity for the students in this study. Rather than a self care measure requiring time and energy in addition to their already demanding schedules, the intervention was a practical application incorporated into their weekly academic activity. Thus, the effectiveness of the intervention-as-part-of-curriculum for mediating perceived stress in this population of high school girls was established with the present research.

The findings regarding affect were not so straightforward, however.

Positive and Negative Affect Scale

Why, then, were there no significant differences observed in affect scores in the young women involved in the present study when previous research has shown interventions of this type to influence affective data in various populations? The measurement tool in this research (PANAS) may not have been sufficiently sensitive to measure changes in affective states as anticipated. Previous research demonstrating measurable “mood enhancements” via yoga and yoga based practices utilized measurement tools specific to depression and anxiety.⁵ While the PANAS scale was selected for the present research to provide an assessment of the impact of the intervention on both positive and negative affect (as opposed to specific negative affective states of depression and anxiety) the measure itself may not have been sensitive enough to register affective changes over time. Differences in the use of the PANAS scale may offer some explanation for this observation.

The PANAS scale has been established as a reliable and valid measure of both state and trait affect.⁶ Instructions for the PANAS scale have been worded so as to measure affect ranging anywhere from “in the present moment” (to assess state affect) to “in general” (as a measure of trait affect). In the present research, the PANAS scale was worded so as to assess how often the students experienced the affective states “in the past week.” The West study, utilizing the PANAS scale, demonstrated significant changes in negative affect but not positive affect after one session of hatha yoga.⁷ The published report on this research did not provide the specific wording utilized in the instructions for PANAS, but it was presumed the scale measured affect “in the present moment” since the measure was taken in the 15 minute intervals directly before and after the intervention session. In short, the two studies while utilizing the same measurement scale, were not necessarily measuring the same phenomenon which could explain why the results were different in each study. The West study measured the immediate impact of the intervention on affect, while the present study assessed the impact over time. Also of note with regards to the West study, the sample population who participated in the yoga session and was measured via the PANAS was only 18 in number. A larger sample size in the West study may have yielded results similar to those reported in the present study with regards to negative affect.

Arguably, procedural implications of the research hindered an accurate assessment of affect via the PANAS scale. The dual role of the primary investigator/intervention facilitator was a research artifact that influenced the outcome in ways that can only be assessed (in the present research design) by conjecture. During the six intervention sessions as well as the two introductory presentations made by the PI, the

research participants had ample time to discern the research hypotheses, and to establish a personal bias. How this influenced the data was unclear within the context of the current research methodology. Future research designed specifically to investigate the impact of the relationship between the intervention facilitator and the research participants could provide clarification. It may also be helpful in future research to separate the two roles of PI and intervention facilitator entirely. This might not completely remove the influence of the relationship between facilitator and research participants, but it would help to address the confounding variable implicit in the dual role of PI/intervention facilitator.

Positive Affect Scores: Issues of measurement and methodology aside, the present research did indeed yield thought provoking information regarding the impact of the intervention on affect in young women. Positive affect scores significantly changed in the students who participated in at least five sessions of the intervention. This finding suggests some type of threshold whereby affect (in this case, positive affect) was indeed impacted by participation in the intervention. When combined with the results of the West research,⁸ questions for future research begin to take form regarding when and how yoga based practices influence affect. (i.e.: Participation in how many sessions are necessary to influence affect? Does the intervention impact affect “in the moment,” “in the past week,” or “in general”?)

Negative Affect Scores: The threshold interpretation could offer an explanation as to the unanticipated results in the present research specific to negative affect. Perhaps the frequency of the intervention was simply not enough to establish a significant change in negative affect over time. Research published while the present study was taking place reported the impact of the frequency of a meditation practice on negative affect.⁹ The

study involved a mantra based meditation technique taught as a stress management tool to 200 healthy adults. The participants were encouraged to practice for 15 – 20 minutes daily. While participants’ scores on all measures of perceived stress and mood improved over time, “more frequent practice was consistently associated with greater reductions in scores for perceived stress and negative emotion and an overall better outcome.”¹⁰ Further research would be useful in discerning the potential for a more frequent practice of the intervention in impacting negative affect.

The authors of the study mentioned above reported that the results “demonstrate that even brief training in a simple non-sectarian meditation practice can be associate with improvements in subjective stress and negative emotions in a general sample of adults *interested in learning meditation* [italics added] as a stress-reduction technique.”¹¹ Participation in the six yoga based sessions was part of the high school curriculum for the juniors in the present study. Students were removed from their study hall period to participate in each session. Antidotal evidence obtained verbally from students (not as part of the research protocol) revealed that many of the students, while enjoying the sessions themselves, were displeased with the loss of study hall time. Virtually all of the published research on yoga based practices similar in nature to the intervention in the present study involved participants who self selected participation in one form or another. The present research opens an interesting avenue of investigation into these practices in that the bias of self selection was at least partially removed. (While participation in the intervention sessions was part of the curriculum, participation in the data collection was completely voluntary. Thus, participation in the research was self selected in a sense.) This could account for the differences found in the present study regarding negative

affect and the results established in other research. Perhaps the absence of the artifact of self selection in the present research rendered an assessment of the impact of yoga based practices on negative affect that was unattainable in previous research designs using self selection as a criterion for participation.

Yet another potential explanation for the negative affect scores recorded in the present research comes from a theoretical model of relaxation-induced anxiety. In an article written by Howard Shear and Nancy Aiken on relaxation-induced anxiety, a defense was made for the premise that “trying to relax is unrelaxing psychologically.”¹² According to the authors, in order for a physical activity to be psychologically relaxing, certain conditions must be in place, namely: “(a) the person has adequate rest, nutrients, and requisite skill to perform the task, (b) the person rationally evaluates [the activity] is an appropriate task to perform at the moment, (c) the person actively, not passively, accepts the task.”¹³ Within these three criteria lay interesting avenues for further scientific investigation based on the present research.

With regards to criteria (a), while no measure of adequate rest was taken in this study, some of the students did indeed fall asleep during the intervention sessions. With adequate rest these young women might have interacted differently with and thus benefited differently from the intervention sessions. Nutritional measures were not considered in the present research either. In fact, no study in the literature on any type of yoga based practice included an evaluation of nutritional aspects. It may prove research worthy in the future to investigate how changes in diet impact the ability to be “non-judgmentally present,” or even to relax. Students in this study were never asked if they felt skilled enough (physically, mentally, emotionally or spiritually) to participate in the

intervention sessions. Future research could investigate how issues of perceived self competency, as discussed in this theory of relaxation-induced anxiety, might influence the impact of the intervention on affective states. The second consideration (b) is particularly interesting with regards to the present research. As discussed earlier, the participants in the present study did not choose to participate in the yoga based sessions and this may have influenced their negative affect scores. Another potential influence might have been the act of “trying to relax” during a time deemed inappropriate by the students. Not only was the intervention a part of their school curriculum, the six sessions replaced a study hall period which was considered imperative by some of the students for keeping up with their assignments. Regarding consideration (c), few of the juniors in the present study actively embraced the intervention sessions initially. During the first semester, resistance to and nervousness about the intervention sessions was palpable by the PI at the onset. This dissipated noticeably by the end of the six weeks. As noted in the methodology chapter, the students who participated in the sessions during the first semester were not eligible for the present study. A sense of resignation in the second semester replaced the resistance perceived by the PI from the first semester group of participants. Some of the students did embrace the chance to practice yoga during school hours, but many did not “actively accept the task.”

As seen in the context of these three conditions for psychological (not just physical) relaxation, the six intervention sessions may have resulted in relaxation-induced anxiety for some of the research participants. This could account for the non-significant results regarding negative affect in the group means over time. This particular aspect of the present research opens avenues for investigating further influences such as perceived

skill, nutrition, rest, perception of appropriateness and self selection on the impact of the intervention and other similar self care practices. Establishing situation-specific efficacy will optimize the effective utilization of these techniques and practices.

One final perspective on the results of the present research specific to negative affect could be distilled into a concept central to yoga based practices: non-attachment. Practices such as yoga and meditation encourage the practitioner to become a non-judgmental observer of the body, the mind, and the emotions. The intention in these types of practices is to cultivate the capacity to observe without attachment to outcomes. The “ultimate goal of yoga is not the cultivation of certain emotions as values, or even the attainment of an unperturbed mind, but to bring all mental modifications to a complete suspension.”¹⁴ This concept is, in part, what distinguishes mindfulness practices such as yoga from cognitive based psychotherapies, where a distinct goal is set to change affect. “Whereas change often does accompany the practice of mindfulness, it is not because undesirable conditions or emotions are ‘pushed away,’ but rather because people learn to live with and accept their psychological and physical limitations.”¹⁵ Perhaps the very absence of a significant change in negative affect scores is indicative of the students’ experience and achievement of “non-attachment” via the intervention sessions.

PANAS Results Summary: To be clear, changes in affect are not to be associated implicitly with enhanced health and wellbeing. As discussed at length in the literature review chapter, emotions (positive, negative, or a combination thereof) hold the potential for both enhancing and diminishing health. Thus, the present study does not imply that the research participants had moved toward or further away from the healthy end of the

health/disease spectrum simply because of recorded PANAS scores. The purpose of the intervention was not to assess if the students were healthier because of participation in the intervention, but to establish if the intervention could provide a means for mediating the effects of prolonged or inappropriate emotional states that are associated in the literature with a variety of disease processes. In other words, did the intervention impact emotional states? As applied to the types of positive affect PANAS measures, the answer is yes – but only when participating in five or more sessions. With regards to negative affect, the intervention had no measurable impact as evaluated by the PANAS scale.

Implications within Current Research Models

Introduced in the literature review chapter of this text were scientific models cited in the literature as points of departure for current research and thus present understanding of emotions and stress, and their relationship to health. In the following discussion, the results of the present research will be placed within the context of these models.

Physiological Model

As discussed previously, the model used predominantly in studies involving the impact of emotions on health is the physiological model. Research involving the relaxation response is based on the understanding of the physiological impact of emotions discerned through this model. Herbert Benson, the researcher whose name has become synonymous with the phenomenon, proposed that the intentional elicitation of the relaxation response provided an antidote to the activation of the sympathetic-adrenal medulla (SAM),¹⁶ or otherwise known as the General Adaptation System (GAS).¹⁷ “The relaxation response is a physical state of deep rest that changes the physical and emotional responses to stress (e.g., decreases in heart rate, blood pressure, rate of

breathing, and muscle tension).”¹⁸ The present study supports the relaxation response-as-antidote-to-GAS-premise of Dr. Benson’s research model via the reduced PSS scores recorded in the girls who practiced intentional relaxation as part of the present research intervention. Future research to discern how the changes in subjective stress levels observed as a result of the present research intervention translate into physiological processes is recommended.

Behavioral Model

The behavioral model of positive and negative emotional states was depicted in the literature review chapter via the following diagram:

Table 10: Behavioral Model

	Behavioral Activation System (BAS) (Moving toward positive reinforcers)	Behavioral Inhibition System (BIS) (Avoiding punishment or harm)
Successful	Elation Eagerness	Relief Calm
Unsuccessful	Sadness Depression	Fear Anxiety

Positive emotions fall into the upper two quadrants in this model, thus positive emotions correlate with either successfully moving toward positive reinforcers or successfully avoiding punishment or harm. The present research reported a significant increase in PA after participation in five or more yoga based sessions; however, there was no clear indication as to whether the intervention was effective in successfully moving toward positive reinforcers or moving away from punishment and harm. In critically reviewing the words used in the PANAS to assess positive affect states (interested,

excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, active), one could argue that these were descriptors for positive emotions within the BAS (moving toward positive reinforcers) and not the BIS systems of this behavioral model. Likewise, the PANAS words used to ascertain negative affect states (distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid) would fall most logically in the lower right hand quadrant of the above diagram; in other words, they measured affective states associated with unsuccessfully avoiding punishment or harm (BIS).

Incorporating information provided by the physiological model (discussed in detail in Chapter Two) into the behavioral model, relationships between the two models that may impact future research become apparent.

Table 11: Behavioral and Physiological Models

	Behavioral Activation System (Moving toward positive reinforcers)	Behavioral Inhibition System (Avoiding punishment or harm)
Successful	Elation Eagerness Sympathetic-adrenal medulla (SAM) Activation	Relief Calm Pituitary-adrenal cortex (PAC) Activation
Unsuccessful	Sadness Depression Pituitary-adrenal cortex (PAC) Activation	Fear Anxiety Sympathetic-adrenal medulla (SAM)Activation

The PANAS scale used in the present research could arguably be described as a measurement tool for the affective states associated with SAM activation on the above diagram. Future research into the impact of the intervention on affective states associated

with PAC activation (such as sadness, depression, calm and relief) would help to bring a comprehensive perspective into the affective impact of the intervention.

Affective Personality Model

Discussed in literature review chapter was a small but promising reservoir of research into the interrelationships of positive and negative emotions and the impact of those relationships on health. This model proposes four distinct affective personalities based on studies utilizing the PANAS scale:

Table 12: Affective Personalities

Self-Actualizing (High PA; low NA)	High Affective (High PA; High NA)
Low Affective (Low PA; Low NA)	Self-Destructive (Low PA; High NA)

The present research methodology was not specifically developed to assess the changes in affective personality types. Within the context of this model however, one could interpret the significant increase in PA scores as an indication that the intervention was effective in moving the students toward the self-actualizing quadrant of the above diagram. The significant reduction in PSS scores recorded in the young women involved in the present research supports research that indicated self-actualizers perform better under stress than those with self-destructive personality types.¹⁹ While the present research provided no evidence that affective personality, according to this model, is a malleable phenomenon, it does introduce an interesting line of potential investigation. Previous research in this area has only investigated correlations among PANAS measures and health related phenomena.²⁰ Future research would be beneficial in discerning the

potential for changing affective personality through specific self care interventions such as the one explored in the present research.

Research Limitations

“The results of each study must be considered in light of its limitations, and final conclusions are reached on the basis of a body of evidence, not on a single investigation.”²¹

Various limitations to the present research have been discussed throughout this chapter thus far. The following discussion is not intended to be comprehensive but to add to the observations previously addressed.

Design and Internal Validity

As mentioned earlier, one of the interesting features of the present research design rested in its potential for assessing the impact of the intervention on a group of teenaged girls who had not self selected for participation in the research. Ultimately however, the research design rendered only a “quasi” control for self selection. While all the students were required to participate in the intervention sessions as part of their junior year curriculum, not all of the students “chose” to participate in the research data collection. Ethical concerns mandated that the juniors and their parents consent to research participation regardless of the obligatory nature of the interventions sessions. Pre-assigned classroom placements and the academic schedule also prohibited randomization of the research population which impacted the study’s internal validity.

Originally, the research was designed for completion during the first semester of the academic year. As such, the junior girls who participated in the intervention sessions during the first semester were to serve as the research population and the juniors slated to

participate in the sessions during the second semester were to serve as the control group. This design was modified as described in the methodology chapter. The design modification both added to and detracted from the study's internal validity. During the second semester of the junior year, college related activities move to the fore; including submitting college applications, visiting prospective schools, competing for scholarships and securing financial resources. Assessing the scores of the intervention group against the scores of another group of junior girls who were going through the second semester at the same time added to the internal validity of the research. However, there was no control measure in the present research design for the interactions that occurred between students who participated in the interventions sessions during the first semester and those who were part of the research in semester two. As reported earlier, the PI noted a palpable difference between the first and second semesters in the reactions of the juniors to the intervention sessions. The present research design did not allow for measuring how the novelty effects of the intervention (or the absence of novelty) impacted the data, thus threatening both the internal and external validity of the research.

In addition to considerations of how the dual role of the PI/intervention facilitator (discussed earlier) might have impacted the data, the roles of the high school faculty members must also be considered as potential sources of research bias. One of the teachers participated in the intervention sessions with the students on Tuesday mornings. The present design provided no control for how her participation (and the lack thereof from the teachers assigned to the two Thursday groups) impacted the students' participation in and reaction to the intervention. The teacher who participated in the Tuesday intervention sessions was also the faculty member who assured the

consent/assent forms and data collection forms were completed, collected and returned to the PI. While there was no measure to assess her enthusiasm for intervention, it could be considered implicit in her choice to actively participate in the sessions. How this influenced the data was unaccounted for in the research design.

As mentioned in appendix form ([Appendix H](#)), an unanticipated artifact arose during the course of the intervention sessions. Without forewarning, news was presented during morning announcements of the high school principal's surgery for breast cancer taking place at the time of the announcement. There was no question that the students were impacted by the announcement. How the announcement ultimately influenced the data was unclear. From the same appendix ([Appendix H](#)) is mention of the "gigglers" in the second group of juniors participating in the intervention sessions on Thursdays. Speculative reasons for the distinct nature of their response to the invention point toward information that could prove beneficial in determining situation-specific effectiveness of the intervention. For example, this was the only group who participated in the intervention directly after, rather than directly before lunch. Perhaps the social nature of the lunch break carried over into the intervention sessions, or perhaps their reaction had more to do with the physiological necessities of digestion. There may have been demographic influences not measured in the present research design (academic achievement, for example) that impacted how this group of students responded to the intervention. Investigative emphasis might also be placed on the distinctive reaction of the other two groups. Participation in the intervention immediately prior to lunch could have been influenced by issues of hunger and simply "needing" a break midway through

the day. Either way, inspecting the current data for differences among the scores of the three intervention groups, holds potential for opening interesting fields of inquiry.

External Validity

One of the disadvantages of laboratory research is that its applicability to circumstances outside the controlled conditions of the laboratory becomes suspect.²² While the external validity of the present research was enhanced because it was conducted within a “natural” environment, generalizing the results to other populations and circumstances is ill advised for several reasons. Any one of the characteristics unique to the present research population (such as same sex education, religious affiliation, college prep curriculum, ethnicity, and socioeconomic status) may have impacted the results in ways that were not accounted for as part of the research protocol.

Another threat to the external validity of the present research rested in the PI/intervention facilitator. The influence of her enthusiasm for and experience with teaching the intervention protocol may render the intervention ineffective in circumstances other than those specified in the current research protocol. Further research is necessary to determine if the study’s results can be replicated when the intervention is presented by a different facilitator.

Measurement and Statistical Analysis

Subjective stress was measured effectively in the present research via the Perceived Stress Scale. This supports the utilization of the PSS in other research with various population samples.²³ As discussed earlier, the Positive and Negative Affect scale may have lacked the sensitivity necessary to effectively measure changes in affect in this group of adolescent girls. Further investigations into the applicability of

PANAS²⁴ and its various interpretations²⁵ specific to adolescent populations are needed to establish its use as a valid measure of affect in various adolescent population samples. For instance, some of the words (such as proud and ashamed) may elicit responses in a group of adolescent girls educated in Catholic catechism that are not typical in a more religiously diverse population.

The statistical analysis used in the present research was sufficient to measure changes over time both within and between the intervention and control groups. An increase in sample size may have yielded significant changes in affect as measured by PANAS. In the present analysis, the statistical power was reduced when the scores of the girls who missed more than one intervention session were filtered from the data. Further research using larger sample sizes would strengthen and further clarify the research findings.

This discussion emphasizing the limitations of the study is not to dismiss the validity and ultimate applicability of the present research. The promising results suggest the effectiveness of the intervention, as least as it pertains to perceived stress levels. Further research accounting for variables such as the characteristics and size of the population sample, facilitator involvement, and the clarification of the dependent variable measures will help to distinguish the situation specific effectiveness and applicability of the intervention.

Suggestions for Future Research

The following list highlights areas of interest for future research. Some of the ideas presented below have been discussed at various points throughout this chapter; others are presented here for the first time.

- Extend the present research into other adolescent populations with varying demographic characteristics and sizes
- Compare the present intervention with other self care modalities (for example, tai chi, mindfulness meditation, transcendental meditation, etc.)
- Investigate the impact of the intervention on a variety of dependent variables (for example, measures of anxiety, depression, self-efficacy or even standardized achievement scores)
- Improve the present research design to control for self selection and randomization
- Review the results of the PANAS scale used in the present research to assess the degree to which specific word scores changed for each group. This would allow for a clearer understanding of what aspects of positive or negative affect were influenced by the intervention.
- Conduct a follow up study to assess if the changes observed in the research lasted beyond the time constraints of the research protocol. It would also be interesting to investigate in a follow up survey if the research participants still utilized any of the techniques experienced during the intervention; which ones they found most helpful; how and when they used them successfully.
- Investigate the impact of the intervention from the perspective of the faculty interacting with the research population. Do they notice changes in the students' attendance, participation, performance, etc?

The following suggestions are formed from information obtained from the research data that was not anticipated or accounted for in the research protocol. The first

involves the sub-group of data scores that resulted from filtering the girls who had missed more than one intervention session. An observation of note unrelated to the research intervention was the difference in mean scores for PSS, PA and NA in the girls who were absent from school versus the intervention group as a whole. At baseline (before attendance was a factor in the measures), the mean PSS scores were slightly higher for the girls with absences (during the seven weeks of the intervention) than the total intervention group; the PA scores were slightly lower and the NA scores were slightly higher.

Table 13: Mean Scores for Total Intervention Group and Absence Filter Group

Measure	Total Intervention Group	Girls with more than one absence during the six weekly intervention sessions
PSS1	29.95	30.52
PSS2	30.19	31.04
PSS3	28.74	27.68
PA1	29.80	28.14
PA2	28.80	28.11
PA3	31.61	31.86
NA1	25.72	26.27
NA2	25.64	25.53
NA3	24.06	23.23

Opening an entirely new avenue of inquiry, one might explore the relationships between PSS, PA and NA and high school absenteeism in adolescent girls.

Another interesting and unexpected observation came from the control group mean scores. The mean PSS scores increased over the seven week interval between observation 2 and observation 3 in the control group. (PSS1 = 32.22, PSS2 = 30.68, PSS3 = 33.32) The reasons for such an increase in subjective stress levels in the control

group are unaddressed in the current research protocol and could prove worthy of investigation.

Summary

In the present research, the perceived stress scores of the adolescent girls who practiced the yoga based practice decreased significantly over time as compared to the control group. Positive affect scores improved over time in the intervention group, but only in those adolescent girls who participated in five or more sessions. Negative affect scores did not change significantly over time in either the control or intervention groups. The present study points toward a practical, self care intervention that holds potential for enhancing positive affect and reducing subjective stress for young women. Beyond its contribution in the larger scheme of scientific inquiry, the true value of the present research might be its impact on the lives of young women who participated in the research. Reiterating a concept proposed at the close of Chapter One of this dissertation, “The importance and ultimate goal of the present research lies in its practical application for enhancing the lives of young women.” These are the subtleties that may have escaped verification through the present research. As designed and executed, there is no way of knowing how the intervention impacted the consciousness and life of each of the young women; however, no one involved was unaffected by participating in the present investigation.

*Not everything that counts can be counted,
and not everything that can be counted counts.*

~ a sign hanging in Einstein's office at Princeton

Chapter 5 Endnotes:

-
- ¹ Andreas Michalsen, Paul Grossman, Ayhan Acil, Jost Langhorst, Rainer Ludtke, Tobias Esch, George Stafano and Gustav Dobos, "Rapid Stress Reduction and Anxiolysis among Distressed Women as a Consequence of a Three-month Intensive Yoga Program." *Medical Science Monitor* 11, no. 12 (December 2005): 555 – 561; Jeremy West, Christian Otte, Kathleen Geher, Joe Johnson and David D. Mohr, "Effects of Hatha Yoga and African Dance on Perceived Stress, Affect and Salivary Cortisol." *Annals of Behavioral Medicine* 28, no. 2 (2004): 114 – 118.
- ² Gloria R. Deckro, Keli M. Ballinger, Michael Hoyt, Marilyn Wilcher, Jeffery Dusek, Patricia Myers, Beth Greenberg, David Rosenthal, and Herbert Benson, "The Evaluation of a Mind/Body Intervention to Reduce Psychological Distress and Perceived Stress in College Students." *Journal of American College Health* 50, no. 6 (May, 2002): 281 – 287.
- ³ Nancy A. Hamilton, Heather Kitzman, and Stephanie Guyotte, "Enhancing Health and Emotion: Mindfulness as a missing link between cognitive therapy and positive psychology." *Journal of Cognitive Psychotherapy: An International Quarterly* 20, no. 2 (2006): 130.
- ⁴ Sheldon Cohen, Tom Kamarck, and Robin Merlerstein, "A Global Measure of Perceived Stress." *Journal of Health and Social Behavior* 24 (December 1983): 387.
- ⁵ Karen Pilkington, Graham Kirkwood, Hagen Rampes, and Janet Richardson, "Yoga for Depression: The Research Evidence." *Journal of Affective Disorders* 89 (2005): 13 – 24; Yael Netz and Ronnie Lidor, "Mood Alterations in Mindful Versus Aerobic Exercise Modes." *Journal of Psychology* 137, no. 5 (September 2003): 405 – 419; Michalsen, et al, 555 – 561.
- ⁶ David Watson and Lee Anna Clark, *The PANAS-X: Manual for the Positive and Negative Affect Schedule – Expanded Form*. The University of Iowa (1994).
- ⁷ West, et al, 114 – 118.
- ⁸ Ibid, 114 – 118.
- ⁹ James D. Lane, Jon E. Seskevich, and Carl F. Pieper, "Brief Meditation Training Can Improve Perceived Stress and Negative Emotion." *Alternative Therapies* 13, no. 1 (January/February 2007): 38 – 44.
- ¹⁰ Ibid, 42.
- ¹¹ Ibid, 42.
- ¹² Howard Shear and Nancy Aiken, "Relaxation-Induced Anxiety: Clarifying the Paradox." *Medical Psychotherapy* 4 (1991): 80.
- ¹³ Shear and Aiken, 78.
- ¹⁴ Anindita N. Balslev "The Notion of Kelsa and its Bearing on the Yoga Analysis of Mind." *Philosophy East and West* 41, no. 1 (January 1991): 82.
- ¹⁵ Hamilton, Kitzman, and Guyotte, 125.
- ¹⁶ Tracy J. Mayne, "Negative Affect and Health: The Importance of Being Earnest." *Cognition and Emotion* 13, no. 5 (1999): 601 – 635.
- ¹⁷ George Manning, Kent Curtis, and Steve McMillan, *Stress: Living and Working in a Changing World* (Duluth, MN: Whole Person Associates, 1999), 4.
- ¹⁸ Benson-Henry Institute of Mind Body Medicine.
(http://www.mbmi.org/basics/whatis_response_TRR.asp) retrieved 6/15/07.
- ¹⁹ Torsten Norlander, Sven-Ake Bood, Trevor Archer, "Performance Under Stress: Affective Personality, Age, and Regularity of Physical Exercise." *Social Behavior and Personality* 30, no. 5 (2002): 495 – 508.
- ²⁰ Sven-Ake Bood, Trevor Archer and Torsten Norlander, "Affective Personality in Relation to General Personality, Self-Reported Stress, Coping and Optimism." *Individual Differences Research* 2, no. 1 (April 2004): 26 – 37; Norlander, Bood, and Archer, 495 – 508; Torsten Norlander, Asa Johansson, and Sven Ake Bood, "The Affective Personality: Its Relation to Quality of Sleep, Well-Being and Stress." *Social Behavior & Personality* 33, no. 7 (2005): 709 – 722; Torsten Norlander, Helena Von Schedvin and Trevor Archer, "Thriving as a Function of Affective Personality: Relation to Personal Factors, Coping Strategies and Stress." *Anxiety, Stress and Coping* 18, no. 2 (June 2005): 105 – 116.
- ²¹ John D. Cone and Sharon L. Foster, *Dissertations and Theses from Start to Finish*. Washington, DC: American Psychological Association (2005, 13th printing), 246.
- ²² Alan E. Kazdin, *Research Design in Clinical Psychology, Fourth Edition*. (Boston: Allyn & Bacon, 2003), 140.

²³ Cohen, Kamarck, and Merlestein, 385 - 396.

²⁴ David Watson and Lee Anna Clark. "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales." *Journal of Personality and Social Psychology* 54, no. 6 (1988): 1063 – 1070.

²⁵ David Watson and Lee Anna Clark, (1994).

REFERENCES AND BIBLIOGRAPHY

- Achterberg, Jeanne. *Imagery in Healing: Shamanism and Modern Medicine*. Boston: Shambhala, 2002.
- Albernaz, Ami. "Why It's Good to Feel Good." *Science & Spirit* (http://www.science-spirit.org/printerfriendly.php?article_id=457)
- Alter, Michael J. *Sport Stretch*. Champaign, IL: Human Kinetics Publishers, 1990.
- American Psychological Association. www.apa.org
- Anderson, Bob. *Stretching*. Bolinas, CA: Shelter Publications, Inc., 1980.
- Astin, John A., Shauna L. Shapiro, David M. Eisenberg and Kelly L. Forsys. "Mind-Body Medicine: State of the science, implications for practice." *Journal of the American Board of Family Practice* 16, no. 2 (March/April 2003): 131 – 147.
- Ballentine, Rudolph. *Radical Healing: Integrating the World's Great Therapeutic Traditions to Create a New Transformative Medicine*. New York: Three Rivers Press, 1999.
- Balslev, Anindita N. "The Notion of Klesa and its Bearing on the Yoga Analysis of Mind." *Philosophy East and West* 41, no. 1 (January, 1991): 77 – 89.
- Baptiste, Baron. *My Daddy is a Pretzel: Yoga for Parents and Kids*. Cambridge, MA: Barefoot Books, 2004.
- Bardone, Anna M., Terrie E. Moffitt, Avshalom Caspi, Nigel Dickson, Warren Staton and Phil Silva. "Adult Physical Outcomes of Adolescent Girls with Conduct Disorders." *Journal of the American Academy of Child & Adolescent Psychiatry* 37, no. 6 (June 1998): 594 – 601.
- Barnes, Patricia, Eve Powell-Griner, Kim McFann and Richard Nahin. "Complementary and Alternative Medicine Use Among Adults: United States, 2002" *CDC Advance Data From Vital and Health Statistics* #343 (May 27, 2004), Hyattsville, MD: National Center for Health Statistics
- Barnoy, S., Y. Bar-Tal, and L. Treister. "Effect of Unrealistic Optimism, Perceived Control of Disease, and Experience with Female Cancer on Behavioral Intentions of Israeli Women to Undergo Screening Tests." *Cancer Nursing* 26, no. 5 (October 2003): 363 – 369.
- Barrett, Jennifer. "Take Your Yoga to Work." *Yoga Journal* 165 (2002): 90 – 99, 160.
- Beauchamp-Turner, Deborah, and Daniel Levinson. "Effects of Meditation on Stress, Health, and Affect." *Medical Psychotherapy* 5 (1992): 123 – 132.

- Beck, Mark F. *Theory and Practice of Therapeutic Massage, Third Edition*. Albany, NY: Milady Publishing, 1999.
- Bekker, Marrie H. J., and Kirsten Boselie. "Gender and Stress: Is gender role stress? A re-examination of the relationship between feminine gender role stress and eating disorders." *Stress and Health: Journal of the International Society for the Investigation of Stress* 18, no. 3 (August, 2002): 141 – 149.
- Bell, Lorna, and Eudora Seyfer. *Gentle Yoga*. Berkeley, CA: Celestial Arts, 1982.
- Benson, Herbert. *Timeless Healing: The Power and Biology of Belief*. New York: Fireside, 1996.
- Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital.
www.mbmi.org.
- Bertherat, Theresa, and Carol Bernstein. *The Body Has Its Reasons: Self-Awareness Through Conscious Movement*. Rochester, VT: Healing Arts Press, 1989.
- Bianchi, G., C. Cavenago, and M. Marchese. "Can the Practice of Yoga be Dangerous? Considerations over a case of epiphyseal separation of the distal tibia in a teenager." *Journal of Orthopedic Traumatology* 5 (2004): 188 – 190.
- Biel, Andrew. *Trail Guide to the Body: How to Locate Muscles, Bones, and More, Second Edition*. Boulder, CO: Books of Discovery, 2001.
- Biro, Frank M., Ruth H. Striegel-Moore, Debra L. Franko, Justina Padgett, and Judy A. Bean. "Self-Esteem in Adolescent Females." *Journal of Adolescent Health* 39 (2006): 501- 507.
- Blank, S.E. "Physiological Responses to Iyengar Yoga Performed by Trained Practitioners." *Journal of Exercise Physiology* 9: 7-23.
- Bloemer, Nancy. *The Now River: Practical Techniques for Living in the Present Moment*. Covington, KY: Now River Publications, 2003.
- Bohart, Arthur C. "Focusing on the Positive, Focusing on the Negative: Implications for Psychotherapy." *Journal of Clinical Psychology* 58, no. 9 (2002): 1037 – 1043.
- Bood, Sven-Ake, Trevor Archer, and Torsten Norlander. "Affective Personality in Relation to General Personality, Self-Reported Stress, Coping and Optimism." *Individual Differences Research* 2, no. 1 (April 2004): 26 – 37.
- Borysenko, Joan. *Minding the Body, Mending the Mind*. Toronto: Bantam Books, 1987.

- Boyle, Colleen A., Stephen P. Sayers, Barbara E. Jensen, Samuel A. Headley, and Tina M. Manos. "The Effects of Yoga Training and a Single Bout of Yoga on Delayed Onset Muscle Soreness in Lower Extremity." *Journal of Strength and Conditioning Research* 18, no. 4 (November 2004): 723 – 729.
- Brennan, Barbara Ann. *Hands of Light: A Guide to Healing Through the Human Energy Field*. Toronto: Bantam Books, 1987.
- Brooks-Gunn, J. and Michelle P. Warren. "Biological and Social Contributions to Negative Affect in Young Adolescent Girls." *Child Development* 60, no. 1 (February 1989): 40 – 55.
- Bruyere, Rosalyn L. *Wheels of Light: Chakras, Auras, and the Healing Energy of the Body*. New York: Simon & Schuster, 1989.
- Butler Sharon. *Conquering Carpal Tunnel Syndrome and Other Repetitive Strain Injuries*. Oakland, CA: He Harbinger Publications, 1996.
- Cahn, B. Rael, and John Polich. "Meditation States and Traits: EEG, ERP, and Neuroimaging Studies." *Psychological Bulletin* 132, no. 2 (2006): 180 – 211.
- Calais-Germain, Blandine. *Anatomy of Movement*. Seattle: Eastland Press, 1991.
- Calais-Germain, Blandine, and Andree Lamotte. *Anatomy of Movement Exercises*. Seattle: Eastland Press, 1992.
- Caldwell, Michaela. *The Girl's Yoga Book: Stretch Your Body, Open Your Mind, & Have Fun!*. Toronto: Maple Tree Press, Inc., 2005.
- Carr, Rachel. *The Yoga Way to Release Tension: Techniques for Relaxation and Mind Control*. New York: Coward, McCann & Geoghegan, Inc., 1974.
- Carlson, Linda E., Michael Specia, Kamala D. Patel, and Eileen Goody. "Mindfulness-based Stress Reduction in Relation to Quality of Life, Mood, Symptoms of Stress and Levels of Cortisol, Dehydroepiandrosterone Sulfate (DHEAS) and Melatonin in Breast and Prostate Cancer Outpatients." *Psychoneuroendocrinology* 29, no. 4 (May 2004): 448 – 474.
- Carver, Charles S. "Affect and the Functional Base of Behavior: On the Dimensional Structure of Affective Experience." *Personality and Social Psychology Review* 5, no. 4 (2001): 345 – 356.
- Chaitow, Leon. *Muscle Energy Techniques*. New York: Churchill Livingstone, 1997.
- Chapin, John, Stacey de las Alas, and Grace Coleman. "Optimism Bias Among Potential Perpetrators and Victims of Youth Violence." *Adolescence* 40, no. 160 (Winter 2003): 749 – 760.

- Chesney, Margaret A., Lynae A. Darbes, Kate Hoerster, Jonelle M. Taylor, Donald B. Chambers, and David E. Anderson. "Positive Emotions: Exploring the other hemisphere in behavioral medicine." *International Journal of Behavioral Medicine* 12, no. 2 (2005): 50 – 58.
- Chrousos, George P., and Phillip W. Gold. "The Concepts of Stress and Stress System Disorders: Overview of physical and behavioral homeostasis." *Journal of the American Medical Association* 267, no. 9 (March, 1992): 1244 – 1252.
- Clance, Pauline Rose, Michael Mitchell, and Suzanne R. Engelmen. "Body Cathexis in Children as a Function of Awareness Training and Yoga." *Journal of Clinical Child Psychology* 9, no. 1 (Spring, 1980): 82 – 86.
- Clark, Rebecca. *Healing Yourself with Cosmic Healing*. West Nyack, NY: Parker Publishing Company, Inc., 1980.
- Cody, John. *Visualizing Muscles: A New Ecorche Approach to Surface Anatomy*. Lawrence, KS: University Press of Kansas, 1990.
- Cohen, Bonnie Bainbridge. *Sensing, Feeling, and Action: The Experiential Anatomy of Body-Mind Centering*. Northampton, MA: Contact Editions, 1993.
- Cohen, Sheldon. "Contrasting the Hassles Scale and the Perceived Stress Scale: Who's really measuring appraised stress?" *American Psychologist* 41 (June 1986): 717 – 718.
- Cohen, Sheldon, Tom Kamarck, and Robin Mermelstein. "A Global Measure of Perceived Stress." *Journal of Health and Social Behavior* 24 (December, 1983): 385 – 396.
- Cohen, Sheldon, and Sarah D. Pressman. "Positive Affect and Health." *Current Directions in Psychological Science* 15, no. 3 (2006): 122 – 125.
- Collins, Gary. *Overcoming Anxiety*. Santa Fe: CA: Vision House, 1973.
- Conable, Barbara. *How to Learn the Alexander Technique: A Manual for Students*. Portland, OR: Andover Press, 1995.
- Cone, John D. and Sharon L. Foster. *Dissertations and Theses from Start to Finish*. Washington, DC: American Psychological Association, 1993.
- Cooper, Evan. *Um, Like...OM: A Girl Goddess's Guide to Yoga*. New York: Little, Brown and Company, 2005.
- Cortiva Institute: Chicago School of Massage Therapy. www.cortiva.com.

- Couch, Jean. *The Runner's Yoga Book: A Balanced Approach to Fitness*. Berkeley, CA: Rodmell Press, 1990.
- Crawford, John R., and Julie D. Henry. "The Positive and Negative Affect Schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample." *British Journal of Clinical Psychology* 43 (2004): 245 – 265.
- Daniel, Jamila. "Yoga for At-Risk Youth." *New York Amsterdam News* 95, no. 20 (May 13, 2004): 20.
- Davidsdottir, Sigurlina. "Do We Think Ourselves Sick? Psychological processes and health behaviors associated with adolescents' somatic complaints." *Counseling and Clinical Psychology Journal* 1, no. 1 (2004): 42 – 59.
- Davidson, Richard J. "Affective Style and Affective Disorders: Perspectives from Affective Neuroscience." *Cognition and Emotion* 12, no. 3 (1998): 307 – 330.
- Davidson, Richard J., Jon Kabat-Zinn, Jessica Schumacher, Melissa Rosenkranz, Daniel Muller, Saki F. Santorelli, Ferris Urbanowski, Anne Harrington, Katherine Bonus, and John F. Sheridan. "Alterations in Brain and Immune Function Produced by Mindfulness Meditation." *Psychosomatic Medicine* 65 (2003): 564 – 570.
- Davies, Clair. *The Trigger Point Therapy Workbook: Your Self-Treatment Guide for Pain Relief*. Oakland, CA: New Harbinger Press, 2001.
- Deckro, Gloria, Keli Ballinger, Michael Hoyt, Marilyn Wilcher, Jeffery Dusek, Patricia Myers, Beth Greensberg, David Rosenthal, and Herbert Benson. "The Evaluation of a Mind/Body Intervention to Reduce Psychological Distress and Perceived Stress in College Students." *Journal of American College Health* 50, no. 6 (May 2002): 281 – 287.
- Derezotes, Davis. "Evaluation of Yoga and Meditation Trainings with Adolescent Sex Offenders." *Child and Adolescent Social Work Journal* 17, no. 2 (April 2000): 97 – 113.
- Devi, Indra. *Yoga for Americans*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1959.
- Dossey, Larry. *Healing Beyond the Body: Medicine and the Infinite Reach of the Mind*. Boston: Shambhala, 2003.
- _____. *Healing Words: The Power of Prayer and the Practice of Medicine*. New York: Harper Paperbacks, 1993.
- _____. "Notes on the Journey: In Praise of Unhappiness." *Alternative Therapies in Health and Medicine* 2, no. 1 (January, 1996): 7 – 11.
- _____. *Reinventing Medicine: Beyond Mind-Body to a New Era of Healing*. New York: HarperCollins Publishers, 1999.

- Dunning, David, Chip Heath, and Jerry M. Suls. "Flawed Self-Assessment: Implications for Health, Education, and the Workplace." *Psychological Science in the Public Interest* 5, no. 3 (2004): 69 – 106.
- Dworkis, Sam. *ExTension: The 20-Minute-a-Day, Yoga-Based Program to Relax, Release & Rejuvenate the Average Stressed-Out Over 35-Year-Old Body*. New York: Poseidon Press, 1994.
- _____. *Recovery Yoga: A Practical Guide for Chronically Ill, Injured, and Post-operative People*. New York: Three Rivers Press, 1997.
- Dytchwald, Ken. *Body Mind*. Los Angeles: Jeremy P. Tarcher, Inc., 1977.
- Eden, Donna. *Energy Medicine*. New York: Jeremy P. Tarcher/Putnam, 1998.
- Egloff, Boris, Stefan C. Schmukle, Lawrence C. Burns, Carl-Walter Kohlmann, and Michael Hock. "Facets of dynamic positive affect: differentiating joy, interest, and activation in the positive and negative affect schedule (PANAS)." *Journal of Personality and Social Psychology* 85, no. 3 (September 2003): 528 – 540.
- Epstein, Gerald. *Healing Visualizations: Creating Healing Through Imagery*. New York: Bantam Books, 1989.
- Eithier, K. A., T. S. Kershaw, J. B. Lewis, S. Milan, L. M. Niccolai, J. R. Ickovics. "Self-esteem, Emotional Distress and Sexual Behavior among Adolescent Females: Interrelationships and temporal effects." *The Journal of Adolescent Health* 38, no. 3 (March 2006): 268 – 274.
- Federenko, Ilona S., Wolff Schlotz, Clemens Kirschbaum, Meike Bartels, Dirk H. Hellhammer, and Stefan Wust. "the Heritability of Perceived Stress." *Psychological Medicine* 36, no. 3 (March 2006): 375 – 385.
- Feldenkrais, Moshe. *Awareness through Movement*. New York: HarperCollins Publishers, 1990.
- Folan, Liliias. *Liliias Yoga and You*. New York: Bantam Books, 1972.
- Fredrickson, Barbara L., and Christine Branigan. "Positive Emotions Broaden the Scope of Attention and Thought-Action Repertoires." *Cognition & Emotion* 19, no. 3 (April 2005): 313 – 332.
- Fredrickson, Barbara L., Roberta A. Mancuso, Christine Branigan, and Michele M. Tugade. "The Undoing of Positive Emotions." *Motivation & Emotion* 24, no. 4 (December 2000): 237 – 258.
- Gaines, Thomas Robert. *Vitalic Breathing, Fifth Edition*. New York: Thomas Robert Gaines, 1921.

- Gawain, Shakti. *Creative Visualization*. New York: Bantam Books, 1979.
- Gerber, Richard. *Vibrational Healing: New Choices for Healing Ourselves*. Santa Fe, NM: Bear & Company, 1988.
- Gohde, John H. "A History of the Mind Body Connection." *The Natural Health Perspective*. www.naturalhealthperspective.com.
- Goldberg, Joseph F., Susan J. Wenze, Tara M. Welker, Robert A. Steer, and Aaron T. Beck. "Content-specificity of Dysfunctional Cognitions for Patients with Bipolar Mania versus Unipolar Depression: A Preliminary Study." *Bipolar Disorders* 7 (2005): 49 – 56.
- Graves, Krepcho, Mayo, & Hill. "Does Yoga Speed Healing for Patients with Low Back Pain?" *Journal of Family Practice* 53, no. 8 (August 2004): 661-2.
- Gray, Henry. *Gray's Anatomy, Fifteenth Edition*. New York: Barnes & Noble, Inc., 1995.
- Greene, Lauriann, LMP. *Save Your Hands: Injury Prevention for Massage Therapists*. Coconut Creek, FL: Gilded Age Press, 1995.
- Hall, Carrie M. and Lori Thein Brody. *Therapeutic Exercise: Moving Toward Function*. Philadelphia: Lippencott Williams & Wilkins, 1999.
- Hamilton, Nancy A., Heather Kitzman, and Stephanie Guyotte. "Enhancing Health and Emotion: Mindfulness as a missing link between cognitive therapy and positive psychology." *Journal of Cognitive Psychotherapy: An International Quarterly* 20, no. 2 (2006): 123 – 134.
- Hampel, Petra, and Franz Petermann. "Perceived Stress, Coping and Adjustment in Adolescents." *Journal of Adolescent Health* 38 (2006): 409 – 415.
- Hanna, Thomas. *Somatics: Reawakening the Mind's Control of Movement, Flexibility, and Health*. Reading, MA: Addison-Wesley Publishing Company, 1980.
- Hay, Louise L. *Heal Your Body: The Mental Causes for Physical Illness and the Metaphysical Way to Overcome Them*. Santa Monica, CA: Hay House, Inc., 1988.
- Heller, Joseph, and William A. Henkin. *Body Wise: Regaining your Natural Flexibility and Vitality for Maximum Well-Being*. Oakland, CA: Wingbow Press, 1991.
- Henderson, Nicola A., and Gail F. Huon. "Negative Affect and Binge Eating in Overweight Women." *British Journal of Health Psychology* 7 (2002): 77 – 87.
- Heriza, Nirmala. *Dr. Yoga: A Complete Program for Discovering the Head-to-Toe Health Benefits of Yoga*. New York: Jeremy P. Tarcher/Penguin, 2004.

- Hewitt, James. *A Practical Guide to Yoga*. New York: Funk & Wagnalls, 1960.
- Hilton, Perry R. *Statistics Explained: A Guide for Social Science Students*. New York: Routledge, 2003.
- Hittleman, Richard L. *Yoga for Physical Fitness*. New York: Prentice-Hall, Inc. 1964.
- Hoffman, Beate U., and Thomas D. Meyer. "Mood Fluctuations in People Putatively at Risk for Bipolar Disorders." *British Journal of Clinical Psychology* 45, no. 1 (March 2006): 105 – 110.
- Huebner, Angela. "Adolescent Growth and Development." *Family and Child Development Publication: Virginia Cooperative Extension*, Publication 350-850 (2000).
- Innes, K.E., C. Bourguignon, and A. G. Taylor. "Risk Indices Associated with the Insulin Resistance Syndrome, Cardiovascular Disease, and Possible Protection with Yoga: A systematic review." *Journal of American Board of Family Practice* 18, no. 6 (November/December, 2005):491-519.
- International Association of Yoga Therapists. www.iayt.org
- Iyengar, B.K.S. *Light On Yoga, Revised Edition*. New York: Schocken Books, 1979. First published in 1966.
- Jaffe, Dennis T. *Healing from Within: How to Gain Greater Control over Your own Health*. New York: Bantam Books, 1982.
- Jain, S. C., L. Rai, A. Valecha, U. K. Jha, S. O. Bhatnagar, and K. Ram. "Effect of Yoga Training on Exercise Tolerance in Adolescents with Childhood Asthma." *The Journal of Asthma* 28, no. 6 (1991): 437 – 442.
- Jenson, Pauline S. "The Effects of Yoga on the Attention and Behavior of Boys with Attention-Deficit/Hyperactivity Disorder (ADHD)" *Journal of Attention Disorders* 7, no. 4 (2004): 205 – 216.
- Joiner, Thomas E., Janice A. Blalock, and Karen Dineen Wagner. "Preliminary Examination of Sex Differences in Depressive Symptoms among Adolescent Psychiatric Inpatients: The Role of Anxious Symptoms and Generalized Negative Affect." *Journal of Clinical Child Psychology* 28, no. 2 (1999): 211 – 219.
- Kapit, Wynn, and Lawrence M. Elson. *The Anatomy Coloring Book*. New York: Harper Row Publishers, 1977.
- Kazdin, Alan E. *Research Design in Clinical Psychology, 4th Edition*. Boston: Allyn & Bacon, 2003.

- Keleman, Stanley. *Emotional Anatomy*. Berkeley, CA: Center Press, 1985.
- Kelsey, Kristine Susan, Brenda McEvoy DeVellis, Munni Begum, Leigh Belton, Elizabeth Gerken Hooten, and Marci Kramish Campbell. "Positive Affect, Exercise and Self-Reported Health in Blue-Collar Women." *American Journal of Health Behavior* 30, no. 2 (March/April, 2006): 199 – 207.
- Khalsa, Dharma Singh. *Meditation as Medicine*. New York: Simon & Schuster, 2001.
- Kiecolt-Glaser, Janice K., Lynanne McGuire, Theodore F. Robles, and Ronald Glaser. "Emotions, Morbidity, and Mortality: New Perspectives from Psychoneuroimmunology." *Annual Reviews in Psychology* 53 (2002): 83 – 107.
- King, Serge. *Imagineering for Health: Self-Healing Through the Use of the Mind*. Wheaton, IL: Quest Books, 1981.
- _____. *Instant Healing*. Los Angeles: Renaissance Books, 2000.
- _____. *Kahuna Healing*. Wheaton, IL: Quest Books, 1983.
- _____. *Mastering Your Hidden Self: A Guide to the Huna Way*. Wheaton, IL: Quest Books, 1985.
- _____. *Urban Shaman*. New York: Simon & Schuster, 1990.
- Kirkwood, G., H. Rampes, V. Tuffrey, J. Richardson, K. Pilkington, and S. Ramaratnam. "Yoga for Anxiety: A systematic review of the research evidence." *British Journal of Sports Medicine* 39, no. 12 (December 2005): 884-891.
- Kiss, Michaeline. *Yoga for Young People*. New York: Simon & Schuster, 1973.
- Koman, Kathleen. "The Science of Hurt: Medical Researchers and Doctors Work to Close the 'Gates' on Pain." *Harvard Magazine* 108, no. 2 (2005): 46 – 54.
- Kirsta, Alix. *The Book of Stress Survival: Identifying and Reducing Stress in Your Life*. New York: Simon & Schuster, 1986.
- Kraftsow, Gary. *Yoga for Wellness*. New York: Penguin Putnam, Inc., 1999.
- Laboratory of the Study of Stress, Immunity and Disease. Carnegie Mellon University, Department of Psychology. www.psy.cmu.edu/~scohen/
- Lane, Andrew M. and Helen J. Lane. "Predictive Effectiveness of Mood Measures." *Perceptual and Motor Skills* 94, no. 3 (June 2002): 785 – 791.
- Lane, James D., Jon E. Seskevich, and Carl F. Pieper. "Brief Meditation Training Can Improve Perceived Stress and Negative Mood." *Alternative Therapies* 13, no. 1 (January/February 2007): 38 – 44.

- Leadbeater, C. W. *The Chakras*. Wheaton, IL: The Theosophical Publishing House, 1927.
- LePore, Paul C. and John Robert Warren. “The Effectiveness of Single-Sex Catholic Secondary Schooling: Evidence from the National Educational Longitudinal Study of 1988.” Department of Sociology, University of Wisconsin – Madison: CDE Working Paper #96-05.
- Levine, Madeline. *The Price of Privilege: How Parental Pressure and Material Advantage are Creating a Generation of Disconnected and Unhappy Kids*. New York: HarperCollins Publishers, 2006.
- Lidell, Lucy. *The Sivananda Companion to Yoga*. New York: Simon & Schuster, 1983.
- Logan, Henrietta L., Jeffrey J. Gedney, David Sheffield, Yiwen Xiang, and Eva Starrenburg. “Stress Influences the Level of Negative Affectivity after Forehead Cold Pressor Pain.” *The Journal of Pain* 4, no. 9 (November 2003): 520 – 529.
- Luthar, Suniya S. and Shawn J. Latendresse. “Children of the Affluent: Challenges to well-being.” *Current Directions in Psychological Science* 14, no. 1 (2005): 49 – 53.
- Luthar, Suniya S. and Chris S. Sexton. “The High Price of Affluence.” *Advances in Child Development and Behavior*. San Diego, CA: Academic Press, 2004: 125 – 162.
- Malhotra, V., Singh, S., Tandon, O.P., & Sharma, S.B. “The Beneficial Effect of Yoga in Diabetes.” *Nepal Medical College Journal* 7, no. 2 (December 2005): 145-7.
- Manning, George, Kent Curtis and Steve McMillen. *Stress: Living and Working in a Changing World*. Duluth, MN: Whole Person Associates, Inc., 1999.
- Mattes, Aaron. *Active Isolated Stretching*. Sarasota, FL: Aaron Mattes, 1995.
- Mayne, Tracy J. “Negative Affect and Health: The Importance of Being Earnest.” *Cognition and Emotion* 13, no. 5 (1999): 601- 635.
- McKenzie, Robin. *7 Steps to a Pain-Free Live: How to Rapidly Relieve Back and Neck Pain Using the McKenzie Method*. New York: Penguin Putnam, Inc., 2000.
 _____. *Treat Your Own Neck*. Lower Hutt, NZ: Spinal Publications, 1983.
- Mehta, Mira. *Health Through Yoga*. London: HarperCollins Publishers, 2002.
- Melbourne Academic Mindfulness Interest Group. “Mindfulness-based Psychotherapies: A Review of Conceptual Foundations, Empirical Evidence and Practical Considerations.” *Australian and New Zealand Journal of Psychiatry* 40 (2006): 285 – 294.
- Michalsen, Andreas, Paul Grossman, Ayhan Acil, Jost Langhorst, Rainer Ludtke, Tobias Esch, George B. Stefano, and Gustav J. Dobos. “Rapid Stress Reduction and Anxiolysis

- among Distressed Women as a Consequence of a Three-month Intensive Yoga Program.” *Medical Science Monitor* 11, no. 12 (December 2005): 555 - 561.
- Millar, Murray. “The Effects of Perceived Stress on Reactions to Messages Designed to Increase Health Behaviors.” *Journal of Behavioral Medicine* 29, no. 6 (October 2005): 425 – 432.
- Mind Garden, Inc. www.mindgarden.com.
- Molloy, Goeffrey N., Julie F. Pallant, and Aristotle Kantas. “A Psychometric Comparison of the Positive and Negative Affect Schedule Across Age and Sex.” *Psychological Reports* 88, no. 3 (June 2001): 861 – 862.
- Moolasarn, S., S. Sripa, V. Kuessirikiet, K. Sutawee, J. Huasary, C. Chaisila, N. Chechom, and S. Sankan. “Randomized, Controlled, Six-month Trial of Yoga in Healthy Seniors: Effects on Cognition and Quality of Life.” *Alternative Therapies in Health and Medicine* 12, 40-7.
- Myers, Thomas W. *Anatomy Trains: Myofascial Meridians for Manual and Movement Therapists*. Edinburgh: Churchill Livingstone, 2001.
- Myss, Caroline. *Anatomy of Spirit: The Seven Stages of Power and Healing*. New York: Harmony Books, 1996.
- _____. *Why People Don't Heal and How They Can*. New York: Three Rivers Press, 1997.
- Myss, Caroline and Norm Shealy. *The Science of Medical Intuition: Self-Diagnosis and Healing with Your Body's Energy Systems, Study Guide*. Boulder, CO: Sounds True, 2002.
- National Alliance on Mental Illness. www.NAMI.org
- Netz, Yeal and Ronnie Lidor. “Mood Alterations in Mindful Versus Aerobic Exercise Modes.” *Journal of Psychology* 137, no. 5 (September 2003): 405 – 419.
- Norlander, Torsten, Sven-Ake Bood, and Trevor Archer. “Performance during Stress: Affective Personality, Age and Regularity of Physical Exercise.” *Social Behavior and Personality* 30, no. 5 (2002): 495 – 508.
- Norlander, Torsten, Asa Johansson, Sven-Ake Bood. “The Affective Personality: Its Relation to Quality of Sleep, Well-Being and Stress.” *Social Behavior & Personality* 33, no. 7 (2005): 709 – 722.
- Norlander, Torsten, Helena Von Schedvin, and Trevor Archer. “Thriving as a Function of Affective Personality: Relation to Personality Factors, Coping Strategies and Stress.” *Anxiety, Stress & Coping* 18, no. 2 (June 2005): 105 – 116.

- Oinonen, K. A., and D. Mazmanian. "Effects of Oral Contraceptives on Daily Self-ratings of Positive and Negative Affect." *Journal of Psychosomatic Research* 51, no. 5 (November 2001): 647 – 658.
- Olsen, Andrea. *Body Stories: A Guide to Experiential Anatomy*. Barrytown, NY: Station Hill Press, 1991.
- Ornish, Dean. *Dr. Dean Ornish's Program for Reversing Heart Disease*. New York: Random House, 1988.
- Ornstein, Robert, and Charles Swedcionis, eds. *The Healing Brain: A Scientific Reader*. New York: The Guilford Press, 1990.
- Oschman, James. "Breakthrough in Subtle Energies & Energy Medicine." *Bridges* 14, no. 4 (Winter 2003): 1 – 9.
 _____. *Energy Medicine in Therapeutics and Human Performance*. Amsterdam: Butterworth Heinemann, 2003.
- Ostir, Glenn B., Pamela M. Smith, David Smith, and Kenneth J. Ottenbacher. "Reliability of the Positive and Negative Affect Schedule (PANAS) in Medical Rehabilitation." *Clinical Rehabilitation* 19, no. 7 (October 2005): 767 – 769.
- Paulson, Genevieve Lewis. *Kundalini and the Chakras*. St. Paul, MN: Llewellyn Publications, 1994.
- Pearsall, Paul. *The Pleasure Prescription: To Love, to Work, to Play – Life in the Balance*. United States: Hunter House Publishers, 1996.
- Pelletier, Kenneth R. *Mind as Healer, Mind as Slayer*. New York: Dell Publishing, Inc., 1977.
 _____. "Mind as Healer, Mind as Slayer: MindBody Medicine Comes of Age." *Advances* 18, no. 1 (Fall 2002): 4 – 15.
- Pert, Candace. *Molecules of Emotion: The Science behind Mind-Body Medicine*. New York: Touchtone, 1997.
- Peterson, Anne C., Pamela A. Sarigiani and Robert E. Kennedy. "Adolescent Depression: Why More Girls?" *Journal of Youth and Adolescence* 20, no. 2 (April 1991): 247 – 271.
- Pilkington, Karen, Graham Kirkwood, Hagen Rampes, and Janet Richardson. "Review: Yoga for Depression: The Scientific Evidence." *Journal of Affective Disorders* 89 (2005): 13 – 24.
- Phelan, Nancy, and Michael Volin. *Yoga for Women*. New York: Harper & Row Publishers, 1963.

- Platania-Solazzo, A., T. M. Field, J. Blank, F. Seligman, C. Kuhn, S. Schanberg, and P. Saab. "Relaxation Therapy Reduces Anxiety in Child and Adolescent Psychiatric Patients." *Acta Paedopsychiatrica* 55, no. 2 (1992): 115 – 120.
- Prasad, K.VV., M. Sunita, P. S. Raju, M. V. Reddy, B. K. Sahay, and K. J. Y. Murthy. "Impact Of Pranayama And Yoga On Lipid Profile In Normal Healthy Volunteers." *Journal of Exercise Physiology* 9: 1-6.
- Prokhorov, Alexander V., Carla Warneke, Carl deMoor, Karen M. Emmons, Mary Mullin Jones, Carol Rosenblum, Karen Suchanek Hudmon, and Ellen R. Gritz. "Self-reported Health Status, Health Vulnerability and Smoking Behavior in College Students: Implications for Intervention." *Nicotine and Tobacco Research* 5, no. 4 (August 2003): 545 – 553.
- Prudden, Bonnie. *Pain Erasure: The Bonnie Prudden Way*. New York: M. Evans & Company, Inc., 1980.
- Quilty, Lena C., and Jonathan M. Oakman. "The Assessment of Behavioral Activation: The Relationship between Positive Emotionality and the Behavioral Activation System." *European Journal of Personality* 18 (2004): 557 – 571.
- Rama, Swami, Rudolph Ballentine, and Alan Hymes. *Science of Breath: A Practical Guide*. Honesdale, PA: The Himalayan International Institute of Yoga Science and Philosophy, 1979.
- Ramacharaka, Yogi. *Hatha Yoga: The Yogi Philosophy of Physical Well-Being*. Chicago: Yogi Publication Society, 1904.
- Rawls, Eugene S. *A Handbook of Yoga for Modern Living*. New York: Warner Books, 1964.
- Ray, U. S., S. Mukhopadhyaya, S. S. Purkayastha, V. Asnani, O. S. Tomar, R. Prashad, L. Thakur, and W. Selvamurthy. "Effect of Yogic Exercises on Physical and Mental Health of Young Fellowship Course Trainees." *Indian Journal of Physiology and Pharmacology* 45, no. 1 (January 2001): 37 – 53.
- Rosen, Richard. "Get to the Root of Neck Problems." *Yoga Journal* 175 (2003): 80 – 87.
- Rubinfeld, Ilana. *The Healing Hand: Self-Healing Through The Rubinfeld Synergy Methods of Talk and Touch*. New York: Bantam Books, 2000.
- Sagula, D., and K. G. Rice. "Meditation and Yoga Reduce Emotional Stress of Chronic Pain." *Journal of Clinical Psychology in Medical Settings* 11: 333-342.
- Salkind, Neil J. *Statistics for People Who (Think They) Hate Statistics, 2nd Edition*. Thousand Oaks, CA: Sage Publications, Inc., 2004.

- Sandlund, Erica E. and Torsten Norlander. "The Effects of Tai Chi Chuan Relaxation and Exercise on Stress Response and Well-Being: An Overview of Research." *International Journal of Stress Management* 7, no. 2 (2000): 139 – 149.
- Schneider, Carrie. *American Yoga: The Paths and Practices of America's Greatest Yoga Masters*. New York: Barnes & Noble Books, 2003.
- Schultz, R. Louis, and Rosemary Feitis. *The Endless Web: Fascial Anatomy and Physical Reality*. Berkeley, CA: North Atlantic Press, 1996.
- Shealy, C. Norman. *90 Days to Stress-Free Living*. London: Vega, 2002.
- Shealy, C. Norman, and Caroline M. Myss. *The Creation of Health: The Emotional, Psychological, and Spiritual Responses that Promote Health and Healing*. Walpole, NH: Stillpoint Publishing, 1988.
- Shear, Howard, and Nancy Aiken. "Relaxation-Induced Anxiety: Clarifying the Paradox." *Medical Psychotherapy* 4 (1991): 77 – 84.
- Sherman, K.J., D. C. Cherkin, J. Erro, D. L. Miglioretti, and R. A. Deyo. "Comparing Yoga, Exercise, and a Self-care book for Chronic Low Back Pain: A randomized, controlled trial." *Annals of Internal Medicine* 143 (December 2005): 849-56.
- Sherman, Karen. "Reflections on Researching Yoga." *International Journal of Yoga Therapy* 16 (2006): 9 - 10.
- Shih, Josephine H., Nicole K. Eberhart, Constance L. Hammen, and Patricia A. Brennan. "Differential Exposure and Reactivity to Interpersonal Stress Predict Sex Differences in Adolescent Depression." *Journal of Clinical Child and Adolescent Psychology* 35, no. 1 (2006): 103 – 115.
- Sieg, Kay W. and Sandra P. Adams. *Illustrated Essentials of Musculoskeletal Anatomy, Third Edition*. Gainesville, FL: Megabooks, 1996.
- Silveri, M. M., G. K. Tzilos, P. J. Pimentel, and D. A. Yurgelun-Todd. "Trajectories of Adolescent Emotional and Cognitive Development: Effects of sex and risk for drug use." *Annals of the New York Academy of Sciences* no. 1021 (June 2004): 363 – 370.
- Simons, David G., Janet G. Travell, and Lois S. Simons. *Travell and Simon's Myofascial Pain and Dysfunction: The Trigger Point Manual, Volumes One and Two*. Baltimore: Williams & Wilkins, 1999.
- Simpson, P.A., and L. K. Stroh. "Gender Differences: Emotional expression and feelings of personal authenticity." *Journal of Applied Psychology* 89, no. 4 (August, 2004): 715 – 721.

- Siqueira, L., M. Diab, C. Bodian, and L. Rolnitzky. "Adolescents Becoming Smokers: The roles of stress and coping methods." *The Journal of Adolescent Health* 27, no. 6 (December 2000): 399 – 408.
- Sjoberg, Lennart, Lars-Erik Holm, Henrik Ullen, Yvonne Brandberg. "Tanning and Risk Perception in Adolescents." *Health, Risk & Society* 1, no. 6 (March 2004): 81 – 94.
- Slater, Wallace. *Hatha Yoga: A Simplified Course*. Wheaton, IL: Quest Books, 1966.
- Staes, F., K. Stappaerts, E. Lesaffre and H. Vertommen. "Low Back Pain in Flemish Adolescents and the Role of Perceived Social Support and Effect on the Perception of Back Pain." *Acta Paediatrica* 92, no. 4 (April 2003): 444 – 451.
- Stern, Jess. *Yoga, Youth and Reincarnation*. Malibu, CA: Valley of the Sun Publishing Company, 1965.
- Stukin, Stacie. "The Anti-Drug for Anxiety." *Yoga Journal* 173 (2003): 108 – 112.
- Tart, Charles T. *Open Mind, Discriminating Mind: Reflections on Human Possibilities*. New York: Harper & Row Publishers, Inc., 1989.
- Thompson, Clem W., and R. T. Floyd. *Manual of Structural Kinesiology*, Twelfth Edition. St. Louis: Mosby, 1994.
- Tiba, Alexandru, and Aurora Szentagotai. "Positive Emotions and Irrational Beliefs. Dysfunctional Positive Emotions in Health Individuals." *Journal of Cognitive and Behavioral Psychotherapies* 5, no. 1 (March 2005): 53 – 72.
- Tobias, Maxine, and Mary Stewart. *Stretch & Relax: A Day to Day Workout and Relaxation Program*. Tucson, AZ: The Body Press, 1985.
- Tortora, Gerard J. and Sandra Reynolds Grabowski. *Principles of Anatomy and Physiology*, Ninth Edition. New York: John Wiley & Sons, Inc., 2000.
- Tuck, Inez. "Chronic Fatigue Syndrome: A Women's Dilemma." *Health Care for Women International* 21, no. 5 (July/August 2000): 457 – 467.
- United States Department of Justice. "Adolescent Girls: The role of depression in the development of delinquency." *National Institute of Justice Research Preview* (July 1999).
- Von Ah, Diane, Sheryl Ebert, Anchalee Ngamvitroji, Najin Park, and Duck-Hee Kang. "Predictors of Health Behaviours in College Students." *Journal of Advanced Nursing* 49, no. 5 (2004): 463 – 474.

- Voogt, E., A. van der Heide, A. F. van Leeuwen, A. P. Visser, M. P. Cleiren, J. Passchier, and P. J. van der Mass. "Positive and Negative Affect After Diagnosis of Advanced Cancer." *Psycho-Oncology* 14, no. 4 (April, 2005): 263 – 273.
- Watson, David and Lee Anna Clark. "Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales." *Journal of Personality and Social Psychology* 54, no. 6 (1988): 1063 – 1070.
- _____. "On Traits and Temperament: General and Specific Factors of Emotional Experience and Their Relation to the Five-Factor Model." *Journal of Personality* 60, no. 2 (June 1992): 441 – 476.
- _____. *The PANAS-X: Manual for the Positive and Negative Affect Schedule- Expanded Form*. The University of Iowa, 1994.
- Welch, Raquel. *Raquel: The Raquel Welch Total Beauty and Fitness Program*. New York: Fawcett Columbine, 1984.
- West, Jeremy, Christian Otte, Kathleen Geher, Joe Johnson, and David Mohr. "Effects of Hatha Yoga and African Dance on Perceived Stress, Affect, and Salivary Cortisol." *Annals of Behavioral Medicine* 28, no. 2: 114 – 118.
- Wilber, Ken. *A Theory of Everything: An Integrated Vision for Business, Politics, Science and Philosophy*. Boston: Shambhala, 2000.
- _____. *Integral Psychology: Consciousness, Spirit, Psychology, Therapy*. Boston: Shambhala, 2000.
- Williams, K.A., J. Petronis, D. Smith, D. Goodrich, J. Wu, N. Ravi, E. J. Doyle, R. Juckett, M. Munoz Kolar, R. Gross, and L. Steinberg. "Effect of Iyengar Yoga Therapy for Chronic Low Back Pain." *Pain* 115, no. 1:107-17.
- Wolf, Elizabeth. "Upfront: Physician and Author, Larry Dossey" *Santafean* 34, no. 4 (May 2006): 21 – 22.
- Wooley, Allison, Hector Myers, Beth Sternliev, and Lonnie Zeltner. "A Yoga Intervention for Young Adults with Elevated Symptoms of Depression." *Alternative Therapies in Health and Medicine* 10, no. 2 (March/April 2004): 60 – 63.
- Yarcheski, Adela, and Noreen E. Mahon. "A Causal Model of Depression in Early Adolescents." *Western Journal of Nursing Research* 22, no. 8 (2000): 879 – 894.
- Yerxa, Donald. "Broaden and Build: A Conversation with Barbara Fredrickson." *Science and Theology News* (http://www.stnews.org/print.php?article_id=2380)
- Zautra, Alex J., Glenn G. Affleck, Howard Tennen, John W. Reich, and Mary C. Davis. "Dynamic Approaches to Emotions and Stress in Everyday Life: Bolger and Zuckerman Reloaded with Positive as Well as Negative Affects." *Journal of Personality* 73, no. 6 (December 2005): 1 – 28.

APPENDIX A : Statement of Belief

*The meaning of life is found in openness to being and “being present” in full awareness.
- Thomas Merton*

Dr. Herbert Benson in an appendix to his book, *Timeless Healing: The Power and Biology of Belief*, provides for the reader what he calls a “disclosure of belief.” To paraphrase his reasoning for such disclosure, Benson believes it important to have an understanding of where the information in the book is coming from, so that the reader may discern its validity and subsequent applicability. “In the scientific world, it is well known that an investigator’s beliefs and opinions can skew results if so permitted. This is what is called ‘bias.’”¹ While the goal of scientific research is to reduce bias in its many potential forms, it is also widely understood that a complete elimination thereof is not probable. I concur with Dr. Benson in that “just as researchers are required to disclose financial holdings that may be related to the experiments they conduct,”² it is also important to present the personal beliefs and opinions from which the research inquiry is born. Thus, the reader and future investigators will be permitted the opportunity to “judge for [them] selves whether or not such a belief has effected [the] interpretation of the evidence.”³

As primary investigator in this study, I hereby disclose this statement of belief; the milieu from which this research is born:

I believe that within every person, place and thing there resides a Voice of the Infinite, a source of Inner Wisdom. I believe that this Inner Voice always guides us to the highest good for everyone and everything concerned. I believe that distress and dis-

ease (personally, culturally, or planetary) follows from a prolonged lack of communication with this source of Inner Wisdom. Through rituals specific to each culture and its geography, spiritual traditions from every point in recorded time have offered tools for listening to and honoring the Voice of the Infinite. What they all have in common is the time and effort taken to be consciously free from worldly concerns and to be open to listen deeply to the Voice of the Infinite.

I believe that until communicating with the Infinite (the Creator, or whatever moniker suits *your* belief system) in everything and everyone becomes second nature, we must practice quieting the body and mind so as develop the ability to hear the Voice of the Infinite. I believe that the more we hear, the more we will honor not only the wisdom within ourselves but also within everything and everyone around us. I believe that this connection with the Infinite cannot be found in any one method, approach, creed, race or philosophical perspective. It can only be experienced by developing the ability, through whatever means is uniquely appropriate, to simply “be still and know.” As young women are often taught to deny their unique gifts, to disdain their own bodies and ignore their intuitive way of knowing; I believe it is critical for personal, cultural and planetary wellbeing to offer adolescent girls options for listening to and trusting more deeply their Inner Wisdom.

Based in these beliefs, the intention of this work is to foster the space, through whatever means is uniquely appropriate, whereby one can hear and honor her own Inner Wisdom.

*Being present to each moment of my life is living my spirituality.
- Anne Wilson Schaefer*

¹ Herbert Benson, *Timeless Healing: The Power and Biology of Belief*. (New York: Fireside, 1996), 305.

² Ibid.

³ Ibid.

APPENDIX B : Philosophy of the Intervention

The following is a chapter taken from a book¹ written by the primary investigator/intervention facilitator of the present research. The book was published as a self care aid for the reader. Using a river analogy, the book includes techniques for breathing, body awareness and intentional relaxation. Some of the specific techniques utilized in the research intervention can be found within the book's contents. The six weekly sessions used as an intervention in the present research were facilitated from a philosophical perspective that it encapsulated in the following chapter.

Chapter Three

Body Awareness As a Now River Experience

Our bodies are quite literally the point of expression for our spirits as they journey in this physical plane. Our awareness, or lack thereof, of our physical vehicles speaks volumes about how truly present we are at any given moment. Many of us only get in touch with our bodies when something goes "wrong," when it manifests illness or pain just to get our attention and pull us consciously into the now moment. Body awareness is the practice of intentional attunement with the physical expression of our spirit on this plane.

By body awareness I'm not referring to exercise or diet or some other form of manipulation we may exert over our physical presence. I'm talking about using the body as a tool for staying consciously afloat in the Now River. Being aware of our Now Riverboat (our body), and listening closely to it without goals, objectives and judgments, is one way to stay in touch with our journey on this planet. It's more than just keeping your Now Riverboat tuned up as you would a car you hope will last you through a long journey; it's using the body's innate wisdom as a compass, keeping a close eye on the effectiveness of your path, the appropriateness of your direction, etc.

How many people do you know who push and push themselves until Boom! they find themselves in the hospital with a serious illness that they just didn't see coming?

Everyone around them saw it coming, but they sure didn't. Or how many people do you know who in the name of fitness or vanity, exercise and diet to the point of stress fracture, torn ligaments and irreversible digestive disorders? In my years as a body worker, I've seen people mistreat their bodies, ignore them, run from them, starve them, stuff them, blame them, hate them, betray them, abuse them, and the list goes on. I have also watched the wonderful transformation when someone learns to honor, love, listen to and trust their body. For these people, the body becomes more than just a necessary burden while traversing the physical plane but a constant comrade in the journey of life, a true friend, a teacher.

The body is sometimes called a temple, the house of the Divine. I like to think of it in more utilitarian terms. The body is the point of expression for the Divine in the physical plane. It's where it's at. If, as I've learned from various spiritual disciplines, we are

spiritual beings having a human experience, then the most critical point of my soul's purpose is that point where Divine becomes physical. And if indeed our purpose in the physical plane is to remember, experience, express and grow with our Higher Good, then our bodies are the place where all that happens. In this sense our bodies become more than a static temple of the Divine or the burden of the physical plane. Our bodies are our physical experience and expression centers. They are the manifestation of our unique expression of Spirit. They represent the evidence, the effect, the proof of our journey.

One of my favorite quotes taken from *Essays of a Modern Mystic* by H. Spencer Lewis exemplifies this concept beautifully: "*We must always bear in mind that our body is a statue molded and cut by the soul with the chisel of our thoughts.*"

What better way to stay in tune with our journey than by conscious awareness of its physical expression? Volumes have been written about body awareness techniques from every corner of the world. Within the context of this book, we cannot hope to even give the CliffsNotes(tm) version of all that's available in the field. I would recommend that you seek out and investigate whatever piques your interest within the field of body work, be it massage, Feldenkrais, Alexander Technique, yoga, tai chi or whatever. I'm not talking about mindlessly taking up an exercise regimen. I mean finding something that will focus your mind and your body. Not something done to your body by someone else or something you do to it with a specific outcome expected, but something that invites you to listen to, connect with and truly honor the physical expression of your Spirit.

In the next chapter we'll cover a select few of the body awareness and/or yoga techniques that I find useful in everyday situations, addressing specifically the high tension areas of the body, namely the neck, shoulders and back. Again, this is not intended to be a comprehensive or even abbreviated guide on yoga or self care through stretching and body awareness but merely an invitation to explore the vehicle of your Spirit's expression, your body, your Now Riverboat.

COMMUNICATING WITH THE NOW RIVERBOAT

Since each Now Riverboat (body) is unique, there are no generalized "rules" that can be applied across the board to body awareness techniques. The following are simply suggestions you might find helpful in navigating your Now Riverboat excursions.

The Lines Are Open

In practicing the suggested Now Riverboat excursions of Chapter 4, make a personal commitment to open the lines of communication between the mind and body. Intend to simply "be" with your body, without judging, criticizing, comparing or manipulating.

The body can be compared to a small child crying for attention. Sometimes, all you need to do is be still with the child, without fixing or doing anything. Just slow down and turn your undivided attention in his or her direction and the child will often quiet down.

At times the body behaves the same. It may not have anything to say to you. Just knowing you're fully present with the body is sometimes enough to allow it to calm down and release tension.

Sharpen Your Listening Skills

It's been said that inside each one of us is an inner physician, described as that part of you that knows what's best for your optimal health and well-being. Some go so far as to claim that each system, organ and cell of the body has its own unique intelligence. I have found it possible to communicate with this innate intelligence and I strongly encourage you to connect with, listen to and honor its wisdom within yourself. The more you truly listen with respect, the more your body's inner physician will talk. Don't be afraid to ask it anything. Should there be an area of concern, ask what's going on there and how you can help, what specifically you can do to assist, what it is you have to learn, what gift is hidden in its message. Then listen and be open to anything that comes into your awareness. The answers to your questions may very well involve more than just the physical mechanisms of the body. They may concern emotional, mental or spiritual factors anywhere from past lives (if that's appropriate to your belief system) to future fears.

Listening intently is only half the equation. You must also honor what you hear without judgment, criticism, analysis, rationalization or talking yourself out of it. You know how it feels to communicate with someone else. If they are listening intently, you find yourself opening up and telling them all sorts of things without reservation or self-consciousness. By the same token, if you sense that the other person is preoccupied with something else or judging you, criticizing you or defending themselves, you have a tendency to "shut down" and not speak so freely. Well, communication with your body is the same. If you listen with undivided attention, honor and respect, it will speak.

A Stretching Tip

A general rule of thumb when stretching a muscle or muscle group as a Now Riverboat experience, is that if the body does not release or relax in the stretch within 10 - 15 seconds, it may indicate that you're pushing too hard. Rather than relaxing the muscle, you triggered its defense mechanism. Funny thing about stretching, if the body feels threatened in any way (say for example, over-stretched or overworked) it sends "we're in trouble down here!" messages to the brain. The brain responds by sending "alert" messages back to the muscle tissue asking it to contract and protect itself. Now if your intent is to stretch, lengthen and relax a muscle, triggering the body's defenses and inducing muscular contraction is the last thing you want to do.

So move gently and with great respect into a stretch. If you don't get an obvious softening, lengthening or release in the tissue within 10 -15 seconds, back out of it. You stand nothing to gain by placing a muscle in a defensive mode. Less is more. The less you push, the more release, softening and lengthening you're likely to get. In fact.....

It's All a Matter of Semantics

I intentionally refrain from using the word "stretch" during Now Riverboat excursions. To me, the word "stretch" implies manipulation, controlling, changing. "Stretch" implies judgment of some kind. I've judged that something is too tight, too short or too tense and by gosh, I'm out to "fix" it!

I much prefer words like soften, lengthen, elongate and expand. These words, to me, represent a much kinder, gentler and far less judgmental approach to body awareness.

Work Within Your Body's Limitations

There are times in life when you intentionally want to "push the envelope," and you want to find your boundaries and push beyond them. The body awareness tools presented in this text are not such times. During Now Riverboat excursions, it's best to work well within the body's comfort zone. Work slowly, mindfully and with the utmost respect.

Once the body trusts you, the body's boundaries will expand of their own accord, but not until that bond of respect and trust is well established.

You must bear in mind that the body holds restriction, tension and tightness for very good reasons. They are often the body's protective mechanisms. Restrictions don't haphazardly or magically appear in the body. They are responses to stress, trauma and injury on physical, mental, emotional and spiritual levels. And many of those protective mechanisms have been in place so long that the mind, the body, and/or both have forgotten they are there. It's only by becoming aware of those boundaries with respect and honor that they begin to change and move. Working within your limitations also prevents further injury to already traumatized areas. Remember, less is more.

The 50% Rule

When you first begin to explore some of the Now Riverboat excursions presented in the next chapter, only go to about 50% of what you think you can do in any given posture.

This is not only a preventative measure against injury but it reduces your chances of being sore the next day. It's very likely that in some of the suggested techniques, you'll be moving parts of your body in ways they haven't moved in awhile. And if painful soreness is the result, you'll have a hard time justifying continued practice no matter how "good" it is for you. There's a difference between "good" sore and not being able to move the next day. A "good" sore is just a gentle reminder of what you did with your body within the last couple of days. A "bad" sore can be debilitating, slow to heal and hopefully not something you're likely to willfully repeat.

My experience is that the 50% rule is especially crucial for people with fibromyalgia, a condition characterized in part by chronic muscle pain. For these people some of the Now Riverboat excursions feel so good and are such a relief from the pain, that they have a tendency to overdo. As a result, they end up paying dearly for it the next day. No matter how good it feels at the time, don't overdo. The same holds true for any chronic pain condition like arthritis, neck tension, low back pain and past injuries. To ensure that you don't actually exacerbate the original issue, only do 50% of what you think you can.

Elongate Muscles, Not Joints

Many of the Now Riverboat excursions presented in this text are designed to lengthen muscle tissue. The safest and most effective approach involves consciously engaging the thickest part or "belly" of the muscle. In looking at a colored anatomical chart of the muscular system, you'll notice that parts of the chart are colored red and others white.

Let's just say that the red areas of the chart represents muscles that have a rich blood supply. When lengthening or exercising any of the "red" areas of the chart, even if you overdo it, the tissue will most likely heal itself within a couple of days because of the availability of a rich blood supply. Now the white areas of the chart represent mostly connective tissue like ligaments, tendons, cartilage and sheaths of fascia. The white color indicates that these areas have much less blood available to them. As a result, an injury or overuse of these areas presents a potential for a more serious injury that will require a longer healing time and may never completely recuperate. Ask anyone who's ever suffered a sprained joint of any kind. The healing process is long and arduous. When stretching, lengthen the "red stuff" first and protect the "white stuff."

Please bear in mind that this is the Dr. Suess version of the way muscles work. In other words, this is an extremely elementary explanation meant to illustrate a point, not meant to comprehensively explain the miracle or complexities of the human muscular system. Although simplistic, it gets the point across. A stretch should never originate where the muscle attaches to bone, generally at a joint. A good stretch starts in the belly of the muscle where it's the thickest. If you're very flexible, you may be able to safely allow the stretch to move into the joint area but not start there.

Get a good muscle man chart. (I would recommend the Peter Bachin version which is fairly easy to obtain.) Study it. Learn about your body and how it moves. You would not try to operate a piece of equipment or a new software program without learning about it first. What makes you think you can safely work with your body without learning more about how it works? As my myofascial massage instructor Bob King says: "If you want to improve your intuitive skills, learn your anatomy!"

And I might add that if you want to better communicate with your body, learning more about how it's built and how it works will be time well spent.

Pack Light

In the Now River water safety tips contained in chapter one, you'll recall being advised to pack light for your journey, leaving comparison, judgment and criticism behind. This advice bears repeating here. With a popular culture that idolizes the "perfect body," exercises in body awareness can quickly and easily become ugly. You may find a self love, respect and honor for the miracle of your physical form through the Now Riverboat excursions and you may just as easily find self hate, imperfection and a desire to control or manipulate. Remember that what you get out of the postures will only be an amplified version of what you bring to them.

Look Beyond the Obvious

The areas of the body targeted by the following postures are fairly obvious. Invite yourself to expand your awareness of the posture by exploring the areas not so obviously affected. For example, in a sitting twist you can feel the effects on the waistline. But what about the hips, shoulders, neck, arms, face and jaw? Invite your mind to travel to different areas of your body as you're doing a posture. Or let yourself explore the posture's effects on different systems of your body like your bones, your organs, your

skin, your circulation, etc.

It's particularly enlightening to observe the "not-so-obvious" areas while resting after any given posture. You may for instance notice the far-reaching effects of a hip posture on your shoulder or neck area. Or you may perceive an unexpected release in your breathing pattern after a certain movement. Expand your awareness to include more than what you would logically think about any given posture and its physiological, psychological or spiritual effects.

In other words, perspective is paramount. What lense you choose to view through will color your entire experience. Allow yourself to at least consider donning lenses different from those you usually wear.

In addition to "opening up the barn doors" to your awareness of yourself, looking beyond the obvious is a great way to keep your mind engaged in what you're doing. Often in activities, our mind wanders off to investigate more interesting pastures. By opening your awareness to things your mind's not already figured out, you keep your mind attentive and interested in the moment.

Awareness of Opposites

Every movement of the skeletal system involves opposing muscle groups. For one group to contract, another must relax and lengthen. Our natural inclination in many body awareness techniques is to focus on the muscles that scream the loudest, either the ones that are contracting and working very hard or the ones that are reluctantly lengthening and opening up. Whether your intent in a posture is to contract or elongate a specific muscle group, your efforts can be enhanced if you consciously incorporate the opposing muscle group and its action into your awareness. A perfect example lies in the classic "crunch" exercises often recommended for strengthening the abdominal muscles. Your "crunching" will move more toward the effortless end of the exercise sweat spectrum if you include a conscious awareness of the fascia and musculature of the lower back, intentionally softening and opening it to allow a freer movement and deeper contraction of the opposing abdominal muscles. Likewise, if your intent is to lengthen a given muscle group, focusing on a powerful contraction of the opposing muscles will greatly enhance your efforts.

As with many of my lessons in life, I experienced a practical application of the awareness of opposing muscle groups on the bike trail. Struggling to pedal against a hard wind one day, my whole focus was on the pumping motion of my legs; pushing down harder and harder with every rotation of the pedals. Then it occurred to me to consciously use the opposing muscle group. I placed my intent and focus on the action of lifting my legs with each rotation rather than forcing them down. With a simple change in conscious intent, the movement seemed effortless by comparison.

Drawing in a deep breath is another example of the effectiveness of the awareness of opposites. When asked to take a deep breath, most people will focus only on drawing the air into their body, leaving them blue in the face and agitated because they can't seem to

get a deep enough breath. Well of course not! The other half of the equation involves creating a vacuum within the lungs so you have room for all that air. In other words, when you focus on intentionally exhaling completely, your inhalation is not only more complete but also effortless.

The Full Spectrum Experience

Exercises in awareness are all about perspective. Any given moment can be viewed and hence experienced from an infinite array of potential perspectives. Most often, we choose one perspective at the exclusion of the other potential perspectives on the same scale of experience. So, we experience light as the absence or exclusion of darkness, or day as the absence of night, stillness as the absence of activity and so forth.

May I suggest that during your Now Riverboat excursions, you "expand your awareness horizon" so to speak. For example, when in a static posture, embrace with your conscious awareness the movement within that stillness. Or when in a moving posture, find the stillness within movement. Invite your awareness to find relaxation within contraction, or contraction and activity within relaxation. Nothing is only on one end or the other of any spectrum of experience. Invite an expansion of your consciousness by considering what appears to be absent. Openly embrace the full spectrum of potential perspectives physically, mentally, emotionally and spiritually of the current experience. This is a wonderful way to keep the mind pleasantly and effortlessly immersed in your Now Riverboat adventure.

Your Personal Stress Area

Everyone has that area of the body that seems to scream for attention more frequently than others, particularly while under stress or exertion. It may be that old war wound that never quite healed or a genetic blessing gifted to you by your ancestors, but it's the place that just hurts for no apparent reason every now and then. Or it's that chronic discomfort that you somehow have to learn to tolerate in order to live a semi-normal life. For many it's chronic neck, shoulders and low back pain. For others, it's the knee that's just not been right since that football injury years ago. Whatever it is, check in with it every now and then as a conscious part of your overall body awareness. Chances are that you've developed some sort of protective posturing or guarding that actually works to exacerbate the original problem.

One of the manifestations of protective posturing is something termed "recruitment." As a result of chronic postural compromises due to trauma or repetitive motion, the body keeps certain muscles in almost consistent contraction. Even when engaged in activity unrelated to the injured area, the body still "recruits" these muscles to assist with the movement. Say for example, your area of chronic tension is the neck, as it is for many people. Because the body is programmed to contract and use the muscles of the neck and shoulders as major workhorses, your tendency will be to "recruit" the neck and shoulder to help you move your legs, for example. You may be lying on the floor in the sponge position with the intent of raising one leg off the floor and your chin will rise toward the ceiling with your leg, thus enlisting your neck muscles to assist the movement. Your body may be in the habit of consistently recruiting certain muscles regardless of whether

or not it's an efficient use of your body's available energy at the time. The result is a drain of energy, and the perpetuation of a vicious cycle of tension in the traumatized area.

Simple awareness can go a long way in arresting this cycle of chronic pain and tension.

Particularly when working an area unrelated to your "trouble spot," take the time to notice that spot's involvement in your current movement. Chances are you'll be open to a more efficient use of your muscular energy when you become aware of how it's actually being used.

Stillness Between Movements

After each suggested Now Riverboat posture, exercise or technique, allow yourself time to simply rest. I'm not referring to that state of collapse when you "hit the wall" that is often confused with rest. I mean rest as an active, attentive and intentional state of mind, body, heart and soul. Balance your "doing" with time for conscious "being." Let yourself savour and enjoy the deliciousness of the moment created by what you've just done. Be open and receptive to any and all information available to you. Whatever comes to your awareness is exactly what you are to know at the time. Your insights may be physical, mental, emotional or spiritual in nature. Simply be "present" for them.

There may be no insights or observations at all. In which case, simply enjoy the profound peace of stillness.

You might find your observations particularly poignant when doing unilateral movements. For example, after lengthening the neck to one side and before repeating the procedure on the other, consciously rest in a neutral position. Let yourself compare both sides of your body noting how they differ. Often you'll experience remarkable differences between the two sides of your body, thus opening the playing field of your self awareness.

Pain Is No Gain

Consider the Now River is at least one place where the familiar adage "no pain, no gain" does not apply. Pain is a message. It's a cry for your attention. In the case of following Now Riverboat excursions, pain is your body's way of saying that whatever you're doing is inappropriate for you at the time. Stop what you're doing and listen, intently! Perhaps you simply need to adjust the posture slightly to one more appropriate for your particular body's needs. Or maybe you need to try a completely different posture that addresses the same area but in a way much better suited to you. Or maybe through pain, your body is trying to tell you that something needs closer inspection by a trusted health care professional. Whatever the information being relayed, pain is a very strong and urgent message that should never be ignored and certainly never worked through or pushed beyond.

The Means Is The End

Remember as you work with these and other Now Riverboat excursions that there is no destination. You'll never get "there." Peace and relaxation are not places to go but journeys to enjoy. Let go of a goal-oriented mentality and adopt a more open, receptive approach. As stated in several different ways throughout this text, the techniques

suggested here will not get you anywhere. They are not pathways to perfecting yourself. More accurately, they are gentle reminders of the perfection that you already are. Let yourself simply be open to the experience as it occurs, which involves.....

Non-attachment

Often in a teaching situation, I'll begin the session with some gentle breathing and relaxation techniques to quiet the body and mind. Then I'll recommend that the class participants intentionally make clear within their minds the goals or aspirations they have for the session. "What is it that you hope to achieve or attain during this time frame?"

Then I'll suggest that they open themselves up to receiving those goals, consciously giving themselves permission to be successful in attaining them. I may even instruct them to thank themselves before they begin for a productive session reminding them that the way we accept a gift from someone is to thank them for it. So a method of consciously receiving your goals is to thank yourself for them. After having done all of that, I suggest that they intentionally "throw it all out the window! Now that you've acknowledged and spent some time with your goals and given yourself permission to achieve them, release them completely and allow yourself to simply be open and receptive to the process of their manifestation." Let's face it, how often are your dreams fulfilled exactly the way you think they should be? More often than not you do get exactly what you need and not necessarily what you expected. The universe works in mysterious ways. And if we have our minds only on our limiting concept of an acceptable outcome, we'll miss the evolution of what may be best for us in the long run.

Keep your end in sight but let go of your attachment to it and open yourself to enjoy the journey.

The Black and White Perspective

There is no right or wrong way to "do" a Now River expedition. Many people want guidelines, pictures and formulas. They want constant direction and confirmation. "Am I doing this one right? Where should I be feeling this stretch?" An exercise in awareness is simply that and nothing more. It's about being not doing. There is no right or wrong, no black or white, no absolutes. There is only your personal, private and unrepeatable experience of the Now. Looking for confirmation or assurance outside yourself means setting yourself up to someone else's standard. That attitude is in complete opposition to stepping into the Now River to explore and appreciate an experience all your own. In the Now River, there is not only black and white but blue, green, yellow, violet.....an infinite expression of unimaginable beauty. Don't limit yourself to someone else's standard, experience, rules or formulas.

GENERALITIES

- When in doubt, don't! Keep keenly attuned to your inner guidance. If something feels inappropriate, it is.

- Practice on an empty stomach. Try not to eat a heavy meal at least two hours before you practice. This way neither your body's digestive nor movement processes are not compromised.

- Wear loose fitting clothing, particularly around the abdominal area, allowing for complete freedom of movement.
- Use an appropriate exercise mat, rug or blanket. Many of the following suggestions are done on the floor. Be sure you have enough padding to be comfortable.
- I repeat: When in doubt, don't! If something doesn't feel right for you - it's not!

PLEASE NOTE

The previous suggestions are specific to this discussion of the Now River. There are times when some of the issues mentioned above are not appropriate, for example, when stretching is used for therapeutic restoration, rehabilitation or conditioning of muscle tissue.

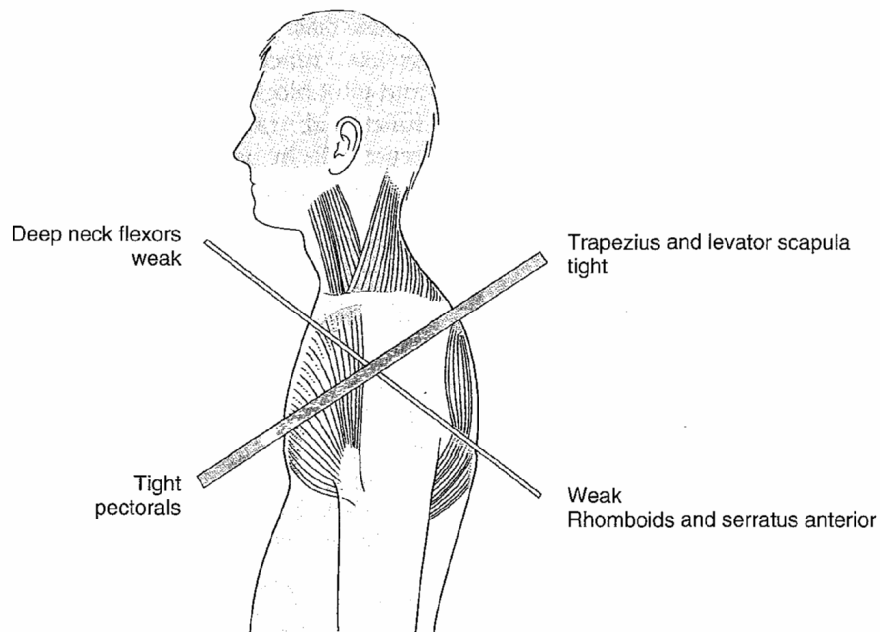
¹ Nancy L. Bloemer. *The Now River: Practical Techniques for Living in the Present Moment*. (Covington, KY: Now River Publications, 2003), 72 – 91.

APPENDIX C : Conceptual Model for Intervention

Release, Lengthen, Strengthen, Maintain

Borrowing from a massage therapy treatment protocol, the following is offered as a paradigm to further explain the intention of the six, yoga based sessions of body awareness and intentional relaxation. This treatment protocol was taught by Bob King during a myofascial certification workshop. Bob King is the co-founder and long time director of the Chicago School of Massage Therapy. He also served as the president of the American Massage Therapy Association.¹

The protocol involves four stages of treatment: release, lengthen, strengthen and maintain (RLSM). The following diagram² will be used to briefly explain the treatment protocol of RLSM.



The diagram shows the muscular implications of the postural distortions commonly associated with chronic neck and upper body tension. The pectorals, trapezius and levator scapula become tight. The corresponding deep flexors of the neck and the rhomboids and serratus anterior of the upper back become weakened. The RLSM treatment protocol as applied to this postural distortion would proceed as follows.

Release: The prescribed treatment first involves releasing the myofascial restrictions holding this pattern in place. This phase would include any number of specific massage techniques. The intention is to release the fascial binding around the affected muscles.

Lengthen: The next step would involve lengthening the chronically shortened muscles through some type of stretching technique. Referring again to the diagram, the pectorals, trapezius and levator scapula would be lengthened.

Strengthen: Once the shortened muscles are opened through lengthening, the opposing muscles are then strengthened. In the case of the diagram above, the deep neck flexors, rhomboids and serratus anterior muscles will be specifically strengthened via some type of muscle specific strengthening exercises.

Maintain: Finally, the treatment protocol calls for maintenance of the corrected postural alignment. This involves consciousness awareness of one's posture during everyday activities; and relaxation techniques designed to allow the body to re-member balanced postural alignment. It is critical to the effectiveness of the protocol that each step is taken in order, as each one opens the opportunity to optimally engage the next step.

This discussion is intended as an introduction to a paradigm, not a recommended treatment plan. Chronic pain and its associated postural distortions are topics too complicated to adequately cover in a paragraph or two. The point of the previous discussion is simply to present a paradigm useful in describing the goal of the intervention of the present research.

The yoga based practice of body awareness and intentional relaxation encompasses the paradigm of RLSM within each session as follows:

Release: Time is taken to release physical, mental, emotion and spiritual resistance and stress through a non-judgmental awareness of the body. Techniques from medical massage therapy, relaxation research and hatha yoga are employed to release tension. This takes place in the first 5 – 10 minutes of the session as described in the methodology section.

Lengthen and Strengthen: The yoga based asanas (postures and movements) encourage both lengthening chronically shortened muscle groups, while strengthening their opposing muscle groups which are typically over extended and weak. The lengthening and strengthening occurs on more than just the physical level, however. The asanas encourage movement that is at times beyond what one typically engages in during routine daily activities, thus mentally the practitioner opens or “lengthens” into new concepts about themselves, their bodies and their capabilities. These new personal perspectives are “strengthened” through repeated practice of the postures and movements. The processes of lengthening and strengthening are applicable on an emotional level as well. In practicing being non-judgmentally present with emotions, thoughts, physical sensations and even spiritual insights, one is afforded an opportunity to

explore these experiences from a completely new perspective. “Metacognition” is the term used by psychologists for this process of the monitoring of thought processes and experiences.³

Maintain: The atmosphere of contemplation and reflection encouraged throughout each session, allows experiences to be integrated and hence maintained beyond the session itself. Each session culminates with time to practice quiet stillness in a physically, mentally, and emotionally neutral position. Termed the “final relaxation” in the methodology section, this portion of each session also fosters maintenance of the experience.

The treatment protocol of RLSM, then, can be used as a formula for each intervention session. It can be said that the on physical, mental and emotional levels, the intervention sessions allow for releasing tension and resistance, opening areas of chronic constriction, strengthening weakened areas, and maintaining the changes.

¹ Cortiva Institute: Chicago School of Massage Therapy, www.cortiva.com/locations/csmt/about/Bob.html

² Leon Chaitow. *Muscle Energy Techniques*. New York: Churchill Livingstone (1997), 32.

³ Melbourne Academic Mindfulness Interest Group, “Mindfulness-based Psychotherapies: A review of conceptual foundations, empirical evidence and practical considerations.” *Australian and New Zealand Journal of Psychiatry* 40 (2006), 288.

APPENDIX D : Consent and Assent Forms

January 5, 2007

Dear parent,

Please read the attached documents concerning a research project involving High School juniors. Please sign one copy and return it to [School IG faculty member] no later than Thursday, January 11, 2007. Retain one copy for your files.

If you have any questions after reviewing the attached, you may leave a message for the researcher, Nancy Bloemer, at 859-750-6710. Thank you for your time and attention.

Happy New Year to you and your family.

CONSENT FORM

Assessing the Impact of a Yoga-based Practice of Body Awareness and Intentional Relaxation on the Affect and Perceived Stress Levels of Adolescent Girls

Holos University Graduate Seminary supports the practice of protection for everyone participating in research. The following information is provided for you to decide whether you wish your daughter to participate in the present study. Note that even if you agree to your daughter's participation in the study, your daughter is free to withdraw at any time without penalty of any kind, without affecting your daughter's opportunities for participation in other projects offered by this department, and without impacting your daughter's grades.

This study is designed to examine the effects of a six week practice of body awareness and intentional relaxation on affect (emotional state) and perceived stress levels. Through a curriculum that addresses the individual as a whole being, your daughter will learn a series of tools she can employ in order to relax the body and quiet the mind when she so chooses. The techniques used in the curriculum are based in the practice of hatha yoga and will include breathing techniques, gentle stretches and relaxation exercises. The research is designed to explore how practicing these techniques impact emotional state and perceived stress levels over time.

As announced by [School IG principal] during the August 2006 Junior Parent meeting, the six week practice of body awareness and intentional relaxation is part of the school curriculum for your daughter's junior year at [School IG]. Participation in the research, however, is optional. If you agree to your daughter's participation in the study, she will be asked to complete two forms three separate times over the course of the school year. The forms are self-assessment tools measuring affect (emotion) and perceived stress levels. Each form will require five to ten minutes to complete and will be done during school hours. Anonymity will be assured through the use of codes rather than names. As a research participant, your daughter will be expected to complete the forms and return them to her teacher. There are no known risks to participating in the six body awareness and intentional relaxation sessions, or in participating in this study. The expected benefits associated with your daughter's participation include an opportunity for her to learn practical tools to calm emotions and manage stress.

This study is being conducted in the 2006/2007 academic year as a doctoral research project by myself, an experienced hatha yoga and stress management instructor who is currently a graduate student at Holos University Graduate Seminary. All procedures for this program have been approved by an advisor in the Energy Medicine and Spiritual Healing program, and by the Executive Committee of Holos University. I do solicit your daughter's participation in this study but it is strictly voluntary. You, or your daughter, remain free to discontinue your daughter's participation in the study at any time without penalty. Should you choose to allow your daughter to participate in this study, be assured that confidentiality will be maintained throughout this project and her name or any other identifying information will not be associated with the research findings in any way. All findings will be presented as averages from all scores, as opposed to information on individual students.

If you would like additional information concerning this study before, during, or after its completion, please feel free to contact me by phone, mail, or e-mail. I appreciate your assistance and commitment. If you have any concerns or questions about your daughter's rights as a research participant, you may contact the Holos University Graduate Seminary, Dean of Faculty and Academic Affairs at (888) 722-6109.

Sincerely,

(Nancy L. Bloemer)
Nancy L. Bloemer, RYT, LMT
Principal Investigator
7895 Stonehouse Road
Melbourne, Kentucky 41059
859-750-6710
nbloemer@fuse.net

Carolyn Faivre, Ph. D.
Holos University Faculty Supervisor
5607 South 222nd Road
Fair Grove, Missouri 65648
630-334-1053

Print Name of Student

Print Name of Parent/Guardian of Student

Signature of Parent/ Guardian of Student

Date

With my signature I acknowledge that I am providing consent for my daughter, named above, to participate in this research study and I have received a copy of the consent form to keep.

January 5, 2007

Dear student,

Please read the attached documents concerning a research project involving High School juniors. Please sign one copy and return it to [School IG faculty member] no later than Thursday, January 11, 2007. Retain one copy for your files.

If you have any questions after reviewing the attached, you may leave a message for the researcher, Nancy Bloemer, at 859-750-6710. Thank you for your time and attention.

Happy New Year.

ASSENT FORM

Assessing the Impact of a Yoga-based Practice of Body Awareness and Intentional Relaxation on the Affect and Perceived Stress Levels of Adolescent Girls.

Holos University Graduate Seminary supports the practice of protection for everyone participating in research. The following information is provided for you to decide whether you wish to participate in the present study. Note that even if you agree to participate, you are free to withdraw at any time without penalty of any kind, without affecting your opportunities for participation in other projects offered by this department, and without impacting your grades.

This study is designed to examine the effects of a six week practice of body awareness and intentional relaxation on affect (emotional state) and perceived stress levels. Through a curriculum that addresses the individual as a whole being, you will learn a series of tools you can employ in order to relax the body and quiet the mind when you choose. The techniques used in the curriculum are based in the practice of hatha yoga and will include breathing techniques, gentle stretches and relaxation exercises. The research is designed to explore how practicing these techniques impact emotional state and perceived stress levels over time.

The six week practice of body awareness and intentional relaxation are part of the school curriculum for your junior year at [School IG]. Participation in the research, however, is optional. If you agree to participate in the research you will be asked to complete two forms three separate times over the course of the school year. The forms are self-assessment tools measuring affect (emotion) and perceived stress levels. Each form will require five to ten minutes to complete and will be done during school hours. Anonymity will be assured through the use of codes rather than names. As a research participant, you will be expected to complete the forms and return them to your teacher. There are no known risks to participating in the six body awareness and intentional relaxation sessions, or in participating in this study. The expected benefits associated with your participation include an opportunity for you to learn practical tools to calm emotions and manage stress.

This study is being conducted in the 2006/2007 academic year as a doctoral research project by myself, an experienced hatha yoga and stress management instructor who is currently a graduate student at Holos University Graduate Seminary. All procedures for this program have been approved by an advisor in the Energy Medicine and Spiritual Healing program, and by the Executive Committee of Holos University. I do solicit your participation in this study but it is strictly voluntary. You remain free to discontinue participation in the study at any time without penalty. Should you choose to participate in this study, be assured that confidentiality will be maintained throughout this project and your name or any other identifying information will not be associated with the research findings in any way. All findings will be presented as averages from all scores, as opposed to information on individual students.

If you would like additional information concerning this study before, during, or after its completion, please feel free to contact me by phone, mail, or e-mail. I appreciate your assistance and commitment. If you have any concerns or questions about your rights

as a research participant, you may contact the Holos University Graduate Seminary, Dean of Faculty and Academic Affairs at (888) 722-6109.

Sincerely,

(Nancy L. Bloemer)
Nancy L. Bloemer, RYT, LMT
Principal Investigator
7895 Stonehouse Road
Melbourne, Kentucky 41059
859-750-6710
nbloemer@fuse.net

Carolyn Faivre, Ph. D.
Holos University Faculty Supervisor
5607 South 222nd Road
Fair Grove, Missouri 65648
630-334-1053

Print Name of Student

Signature of Student

Date

With my signature I acknowledge that I am agreeing to participate in this research study and I have received a copy of the assent form to keep.

January 5, 2007

Dear parent,

Please read the attached documents concerning a research project involving High School juniors. Please sign one copy and return it to [School CG nurse] no later than Thursday, January 11, 2007. Retain one copy for your files.

If you have any questions after reviewing the attached, you may leave a message for the researcher, Nancy Bloemer, at 859-750-6710. Thank you for your time and attention.

Happy New Year to you and your family.

CONSENT FORM
For Control Group Participation

Assessing the Impact of a Yoga-based Practice of Body Awareness and Intentional Relaxation on the Affect and Perceived Stress Levels of Adolescent Girls

Holos University Graduate Seminary supports the practice of protection for everyone participating in research. The following information is provided for you to decide whether you wish your daughter to participate in the present study. Note that even if you agree to your daughter's participation in the study, your daughter is free to withdraw at any time without penalty of any kind, without affecting your daughter's opportunities for participation in other projects offered by this department, and without impacting your daughter's grades.

This study is designed to examine the effects of a six week practice of body awareness and intentional relaxation on affect (emotional state) and perceived stress levels. Through a curriculum that addresses the individual as a whole being, groups of high school juniors similar to your daughter will learn a series of tools designed to relax the body and quiet the mind. The techniques used in the curriculum are based in the practice of hatha yoga and will include breathing techniques, gentle stretches and relaxation exercises. The research is designed to explore how practicing these techniques impact emotional state and perceived stress levels over time.

I am asking for your consent in your daughter's participation in this research as part of a control group. Participation in the research is optional. If you agree to your daughter's participation in the study, she will be asked to complete two forms three separate times over the course of the school year. The forms are self-assessment tools measuring affect (emotion) and perceived stress levels. Each form will require five to ten minutes to complete and will be done during study hall periods. Anonymity will be assured through the use of codes rather than names. As a research participant, your daughter will be expected to complete the forms and return them to her teacher. Your daughter is not being asked to participate in the yoga-based intervention. Should you agree to your daughter's participation in the study her involvement in the research will be limited to completing the forms. There are no known risks to participating in this study.

In consenting to your daughter participation in this study, she will be eligible to participate if she chooses in an abbreviated version of the intervention that will be offered after school hours. The expected benefits associated with your daughter's participation in the abbreviated intervention include an opportunity for her to learn practical tools to calm emotions and manage stress. Your daughter's participation in this study will also benefit [School CG] via a stress management workshop offered to the faculty and staff of the school.

This study is being conducted in the 2006/2007 academic year as a doctoral research project by myself, an experienced hatha yoga and stress management instructor who is currently a graduate student at Holos University Graduate Seminary. All procedures for this program have been approved by an advisor in the Energy Medicine and Spiritual Healing program, and by the Executive Committee of Holos University. I do solicit your daughter's participation in this study but it is strictly voluntary. You, or

your daughter, remain free to discontinue your daughter's participation in the study at any time without penalty. Should you choose to allow your daughter to participate in this study, be assured that confidentiality will be maintained throughout this project and her name or any other identifying information will not be associated with the research findings in any way. All findings will be presented as averages from all scores, as opposed to information on individual students.

If you would like additional information concerning this study before, during, or after its completion, please feel free to contact me by phone, mail, or e-mail. I appreciate your assistance and commitment. If you have any concerns or questions about your daughter's rights as a research participant, you may contact the Holos University Graduate Seminary, Dean of Faculty and Academic Affairs at (888) 722-6109.

Sincerely,

(Nancy L. Bloemer)
Nancy L. Bloemer, RYT, LMT
Principal Investigator
7895 Stonehouse Road
Melbourne, Kentucky 41059
859-750-6710
nbloemer@fuse.net

Carolyn Faivre, Ph. D.
Holos University Faculty Supervisor
5607 South 222nd Road
Fair Grove, Missouri 65648
630-334-1053

Print Name of Student

Print Name of Parent/Guardian of Student

Signature of Parent/ Guardian of Student

Date

With my signature I acknowledge that I am providing consent for my daughter, named above, to participate in this research study and I have received a copy of the consent form to keep.

January 5, 2007

Dear student,

Please read the attached documents concerning a research project involving High School juniors. Please sign one copy and return it to [School CG nurse] no later than Thursday, January 11, 2007. Retain one copy for your files.

If you have any questions after reviewing the attached, you may leave a message for the researcher, Nancy Bloemer, at 859-750-6710. Thank you for your time and attention.

Happy New Year.

ASSENT FORM
For Control Group Participation

Assessing the Impact of a Yoga-based Practice of Body Awareness and Intentional Relaxation on the Affect and Perceived Stress Levels of Adolescent Girls.

Holos University Graduate Seminary supports the practice of protection for everyone participating in research. The following information is provided for you to decide whether you wish to participate in the present study. Note that even if you agree to participate, you are free to withdraw at any time without penalty of any kind, without affecting your opportunities for participation in other projects offered by this department, and without impacting your grades.

This study is designed to examine the effects of a six week practice of body awareness and intentional relaxation on affect (emotional state) and perceived stress levels. Through a curriculum that addresses the individual as a whole being, groups of high school juniors similar to you will learn a series of tools designed relax the body and quiet the mind. The techniques used in the curriculum are based in the practice of hatha yoga and will include breathing techniques, gentle stretches and relaxation exercises. The research is designed to explore how practicing these techniques impact emotional state and perceived stress levels over time.

You are being asked to participate in the research as part of a control group. Participation in the research is optional. If you agree to participate in the research you will be asked to complete two forms three separate times over the course of the school year. The forms are self-assessment tools measuring affect (emotion) and perceived stress levels. Each form will require five to ten minutes to complete and will be done during study hall periods. You are not being asked to participate in the yoga-based intervention. Should you agree to participate in the study, your involvement in the research will be limited to completing the forms. Anonymity will be assured through the use of codes rather than names. As a research participant, you will be expected to complete the forms and return them to your teacher. There are no known risks to participating in this study.

In consenting to participate in this study, you will be eligible to participate if you choose in an abbreviated version of the intervention that will be offered after school hours. The expected benefits associated with your participation in the abbreviated intervention include an opportunity for you to learn practical tools to calm emotions and manage stress. Your participation in this study will also benefit [School CG] via a stress management workshop offered to the faculty and staff of the school.

This study is being conducted in the 2006/2007 academic year as a doctoral research project by myself, an experienced hatha yoga and stress management instructor who is currently a graduate student at Holos University Graduate Seminary. All procedures for this program have been approved by an advisor in the Energy Medicine and Spiritual Healing program, and by the Executive Committee of Holos University. I do solicit your participation in this study but it is strictly voluntary. You remain free to discontinue participation in the study at any time without penalty. Should you choose to participate in this study, be assured that confidentiality will be maintained throughout this

project and your name or any other identifying information will not be associated with the research findings in any way. All findings will be presented as averages from all scores, as opposed to information on individual students.

If you would like additional information concerning this study before, during, or after its completion, please feel free to contact me by phone, mail, or e-mail. I appreciate your assistance and commitment. If you have any concerns or questions about your rights as a research participant, you may contact the Holos University Graduate Seminary, Dean of Faculty and Academic Affairs at (888) 722-6109.

Sincerely,

(Nancy L. Bloemer)
Nancy L. Bloemer, RYT, LMT
Principal Investigator
7895 Stonehouse Road
Melbourne, Kentucky 41059
859-750-6710
nbloemer@fuse.net

Carolyn Faivre, Ph. D.
Holos University Faculty Supervisor
5607 South 222nd Road
Fair Grove, Missouri 65648
630-334-1053

Print Name of Student

Signature of Student

Date

With my signature I acknowledge that I am agreeing to participate in this research study and I have received a copy of the assent form to keep.

APPENDIX E : Presentation to the Intervention Group

Study Introduction Presented to the Junior Class Of [School IG]

- I. Thank you for the opportunity to be a guest lecturer as part of your junior year
 - A. Brief personal introduction
- II. Graduate Studies into Health and Wellness
 - A. Research involving emotions and health
 - B. Research on stress and health
 - C. Adolescents and health
 - 1. Particular health risks for girls
 - D. Hatha Yoga
 - 1. Research on yoga and health
 - 2. Research on girls, emotions, stress and yoga
- IV. The Current Research
 - A. Assessing the impact of a yoga-based practice of body awareness and intentional relaxation on affect and perceived stress in adolescent girls
 - B. Defining terms
 - 1. Hatha Yoga: Breathing, stretching and resting
 - 2. Body awareness
 - 3. Intentional Relaxation
- V. The Intervention
 - A. Six, 50 minute sessions: one per week
 - B. Study design
 - C. What to expect
 - 1. Gentle breathing techniques, stretches and resting postures
 - 2. Wear comfortable clothes
 - 3. Bring mat, blanket or towel
 - 4. You are not expected to do everything; do only what works for you; listen to your body before you listen to my instruction
 - 5. 50% rule: Do only half of what you think you can
 - 6. Keep in touch with me
 - 7. If you are physically incapacitated and cannot participate; inform your teacher and you will be allowed to observe the session
 - D. Each session will be audio taped and available for download, if you would like to practice at home
- VI. Dependent Variables: The Scientific Measurements
 - A. The Positive and Negative Affect Schedule (PANAS)
 - B. The Perceived Stress Scale (PSS)
 - C. Frequency of measures
 - D. Assurance of anonymity
 - E. A final report of the study will be made available through school during the next school year
- VII. Emphasis of our time together:
 - A. THIS IS TIME FOR YOU to rest, rejuvenate, relax, refresh and nurture you

1. Keep in touch with me, let me know what works, what doesn't, how it feels, what you'd like to focus on, etc.
- B. You are a co-researcher in this study: I cannot thank you enough for the opportunity to work with you!

VIII. Conclusion

Slow Me Down, Lord – prose by Wilfred A. Peterson

Slow Me Down, Lord

Slow me down, Lord. Ease the pounding of my heart by the quieting of my mind. Steady my hurried pace with a vision of the eternal reach of time.

Give me amidst the confusion of my day, the calmness of the everlasting hills. Break the tensions of my nerves and muscles with the music of the singing streams that live in my memory.

Help me to know the magic restoring power of sleep.

Teach me the art of taking Minute Vacations...of slowing down to look at a flower, to chat with a friend, to pat a dog, to read a few lines from a good book.

Remind me each day of the fable of the hare and the tortoise that I may know that the race is not always to the swift: that there is more to life than increasing its speed.

Let me look upward into the branches of the towering oak and know that it grew great and strong because it grew slowly and well. Slow me down, Lord, and inspire me to send my roots deep into the soil of life's enduring values that I may grow toward the stars of my greater destiny. Amen.¹

¹ Liliias Folan. *Liliias, Yoga and You*. (New York: Bantam Books, 1972), 1.

APPENDIX F : Newsletter Article

Theology Department
[School IG faculty member]

YOGA HAS BEGUN

As junior parents were made aware at the opening school parent meetings, our junior class has the wonderful opportunity to practice a bit of yoga and be involved in an important research study. Ms. Nancy Bloemer, a local yoga instructor, is researching the effects of yoga on the emotional and psychological well being of adolescent women. Ms. Bloemer teaches basic yoga techniques for relaxation and mental focus. [School IG] is the ideal place for her to gather data. Students will participate in a six week yoga session either second or third quarter. This experience will provide benefits in many areas. As a curriculum supplement, the practice of yoga fits into our Theology course study of World Religions. Many past students have had a taste of yoga as we have studied Hinduism and Buddhism, but this time we'll get a more extensive experience. The students will benefit from learning the life skills of stress management and relaxation. Yoga and other meditation practices have been shown to improve concentration and productivity, as well as physical well being. When I asked a student after her first session, if yoga was worth giving up a study hall she replied, "I didn't want to admit it, but yeah, it was worth it." An added benefit is the opportunity to help someone who contributes to the broader Northern Kentucky community. Though not traditional service, this is definitely what we are about at [School IG]. There is a small group of juniors who, because of their science lab schedule, do not have any study halls. Ms. Bloemer has generously offered to allow these young women to join one of her evening classes at no charge. I hope these students take this opportunity to make time for themselves. I also hope those participating during school take full advantage of this wonderful opportunity, too. I found the session relaxing and invigorating. We'll see how my muscles feel about it tomorrow!

Published in the November, December 2006 & January 2007 issue of a publication for the families of [School IG].

APPENDIX G : Dependent Variable Measures

Assessing the Impact of a Practice of Body Awareness and Intentional Relaxation on Affect and Perceived Stress in Adolescent Girls

Form: O (1)

Date: Week of January 14, 2007

Instructions:

- 1) Please fill in the code just below these instructions.
- 2) Please read the directions for the Perceived Stress Scale (PSS) and complete the scale according to how you have felt in the last month.
- 3) Please read the directions for the Positive and Negative Affect Schedule (PANAS) and complete the scale according to how you have felt in the past week.
- 4) Please return the forms to your teacher.

Thank you, thank you, and thank YOU!!

CODE: _____

Your code consists of the first three letters of your last name followed by the first two letters of your first name. If your name is Jane Wilson, your code would be WILJA.

PANAS

Directions

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you have felt this way during the past week.

Use the following scale to record your answers.

(1) = Very slightly or not at all (2) = A little (3) = Moderately (4) = Quite a bit (5) = Extremely

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested	1	2	3	4	5
Distressed	1	2	3	4	5
Excited	1	2	3	4	5
Upset	1	2	3	4	5
Strong	1	2	3	4	5
Guilty	1	2	3	4	5
Scared	1	2	3	4	5
Hostile	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Irritable	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Inspired	1	2	3	4	5
Nervous	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Jittery	1	2	3	4	5
Active	1	2	3	4	5
Afraid	1	2	3	4	5

Perceived Stress Scale

Perceived Stress Scale: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems to be a reasonable estimate. For each question, choose from the following alternatives:

0 = never 1 = almost never 2 = sometimes 3 = fairly often 4 = very often

1. In the last month, how often have you been upset because of something that happened unexpectedly? 0 1 2 3 4
2. In the last month, how often have you felt that your were unable to control the important things in your life? 0 1 2 3 4
3. In the last month, how often have you felt nervous and "stressed"? 0 1 2 3 4
4. In the last month, how often have you dealt successfully with irritating hassles in your life? 0 1 2 3 4
5. In the last month, how often have you felt that your were effectively coping with important changes that were occurring in your life? 0 1 2 3 4
6. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4
7. In the last month, how often have you found that things were going your way? 0 1 2 3 4
8. In the last month, how often have you found that you could not cope with all the things that you had to do? 0 1 2 3 4
9. In the last month, how often have you been able to control irritations in your life? 0 1 2 3 4
10. In the last month, how often have you felt that you were on top of things? 0 1 2 3 4
11. In the last month, how often have you been angered because of things that happened that were outside your control? 0 1 2 3 4
12. In the last month, how often have you found yourself thinking about things that you have to accomplish? 0 1 2 3 4
13. In the last month, how often have you been able to control the way

your spend your time? 0 1 2 3 4

14. In the last month, how often have you felt difficulties were piling up
so high that you could not overcome them? 0 1 2 3 4

APPENDIX H : Intervention Sessions

Included in this appendix is a session by session list of what techniques were presented for practice during the six intervention sessions with the three groups of juniors. Also included are the subjective observations of the PI written directly after each session. These lists are presented to establish that the sessions were consistent among the three groups. As the present study was concerned with assessing the impact of a regular practice of body awareness and intentional relaxation descriptions of each of the techniques are not included here. Were the research objective to establish the effectiveness of specific techniques, such details would be included. Many of the techniques listed below have been previously published by the PI.¹ A copy of the audio recordings of these particular sessions may be obtained from the PI upon request.

While no provisions were made in the research design for qualitative data, the subjective observations of each session from the PI's perspective are included here in appendix form. Be it noted that according to the PI's subjective perspective, each group of students were distinct in their participation in the intervention. The Tuesday group, while initially reserved, was the most interactive and seemingly interested. This was the only group that included a teacher who participated in each session with the students. The teachers of the other sessions, while present according to diocesan requirements, used the time to for paperwork and did not participate in the sessions. The second Thursday group was prone to fits of giggling throughout the series. Although they

appeared to be the students least interested in the intervention, this group was the only one to present the PI with tokens of gratitude at the completion of the series.

Other experimental artifacts emerge in the PI's subjective comments that follow. For example, the techniques utilized in the first session of the second Thursday group were modified due the presence of a male teacher in the room. This was discussed with the faculty contact. After that first session, the female athletic director was established as the required faculty presence for second Thursday group sessions. Another interesting artifact that emerged during the intervention was the announcement of the principal's surgery for breast cancer. The impact on the students was palpable during the sessions following the surprise announcement.

Evidence is presented in the following list for the interactive and fluid approach to the sessions throughout the series. Accommodations were made for timing (two sessions were reduced to 40 minutes when the school was on a one hour weather related delay) and for temperature (when the weather was particularly cold, sessions included more physically active techniques). The sessions were also designed to respond to inquires from the students about specific concerns and conditions.

Tuesday, January 30, 2007

Brief intro: Clothes, mat, 50% rule, do only what works for you; this time is for you

Savasana

Diaphragmatic Breathing

Tension Reliever

Pump (no ties)

Seated head and neck exercises

Shoulder rolls

Cleansing Breathing

10 – 1 countdown

PI COMMENTS:

We started a bit late. I ended without sufficient time for the girls' reentry. Good group. Mostly quiet. They enjoyed the cleansing breathing. The gym works well. They have much more room. It is a bit cold. Acoustic aren't particularly ideal.

Thursday, February 1, 2007 – Group 1

Brief intro: Clothes, mat, 50% rule, do only what works for you; this time is for you
Savasana

Diaphragmatic Breathing

Tension Reliever

Pump (no ties)

Seated head and neck exercises

Shoulder rolls

Cleansing Breathing

10 – 1 countdown

PI COMMENTS:

The session got started a bit late again. Some of the girls had gone to the chapel, others to the study hall classroom. The girls in this session were great – very sweet, quiet, attentive and appreciative. I ended the session a bit too early – compensating perhaps for cutting it too close in the Tuesday session.

Thursday, February 1, 2007 – Group 2

Brief intro: Clothes, mat, 50% rule, do only what works for you; this time is for you
Savasana

Diaphragmatic Breathing

Tension Reliever

Pump (no ties) – NO SHORT ADDUCTOR OPENER

Seated head and neck exercises

Shoulder rolls

10 – 1 countdown

PI COMMENTS:

The class again started a bit late as there was confusion about where the girls should be. The study hall teacher, a male – was also late finding the class. The session was modified to accommodate the presence of a man in the room. The short adductor stretch was deleted from the pump series. The girls were very restless in this group. It may be attributed to a multitude of factors, many of which I will never be privy to. I can mention a couple factors that I believe did impact this group's participation in the session. 1) The session is held directly after the lunch period for these girls. They were especially chatty, giggly and unable to calm down and focus. 2) There was a core group of girls in this session who were particularly disruptive – almost as if they were “ring leaders of what it is to be cool.” 3) The presence of a man in the room was, from my perspective, a hindrance to girls' ability to focus. Asking young women to intimately explore their body, mind and emotions in the presence of a male who: a) is not a member of their immediate family, b) has the expressed job of monitoring their actions during this time frame, and c) is an authority figure in the school system – is inappropriate, unfair and could be perceived as harmful. This must be addressed.

Tuesday, February 6, 2007

Explanation of Savasana

Savasana

Counted diaphragmatic breathing

Wind reliever

Body rolls, rock and rolls

Windshield wipers with abdominal work

Cat cow

Lunges

Child's pose

Feet exercises

Tadasana

Forward bend

Moon salute

Rag doll

Cleansing breathing and Vitalic Cleansing

Final: progressive

PI COMMENTS:

It was very cold. The temperature had not been above the teens in several days. This class was intended to generate warmth, so there was more movement than generally expected on a second session. This particular group is very quiet and contemplative. They are difficult to engage in interaction but do very well with all the techniques.

Thursday, February 8, 2007 – Group 1

Explanation of Savasana

Savasana

Counted diaphragmatic breathing

Wind reliever

Body rolls, rock and rolls

Windshield wipers with abdominal work

Cat cow

Lunges

Child's pose

Feet exercises

Tadasana

Forward bend

Moon salute

Rag doll

Cleansing breathing and Vitalic Cleansing

Final: progressive

PI COMMENTS: Group is quiet and attentive. Seems to enjoy. Does very well.

Thursday, February 8, 2007 – Group 2

Explanation of Savasana

Savasana

Counted diaphragmatic breathing
Wind reliever
Body rolls, rock and rolls
Windshield wipers with abdominal work
Cat cow
Lunges
Child's pose
Feet exercises
Tadasana
Forward bend
Moon salute
Rag doll
Cleansing breathing ONLY

Final: progressive

PI COMMENTS: [School IG principal] was the teacher for the class, replacing [male faculty member]. [School IG faculty contact] felt that the presence of the principal in the class might actually inhibit the girls more than having a man in the room. {School IG faculty contact} had spoken to the girls about the giggling the previous week. They said that [male faculty member] wasn't an issue for them. [School IG faculty contact] said that this group of girls has gigglers in it. The girls were very dear. They apologized for the giggles prior to class beginning. They did better in this class but still were a bit giggly and uncomfortable. There are only three or four who are this way. The others seem to be doing well.

Tuesday, February 13, 2007

SCHOOL CANCELLED DUE TO WINTER WEATHER

Thursday, February 15, 2007 – Group 1

SCHOOL WAS ON A ONE HOUR DELAY DUE TO WEATHER CONDITIONS.
CLASSES REDUCED TO 40 MINUTE SESSIONS.

Savasana

Counted diaphragmatic to ratio breathing

Body rolls, rock and rolls and hip rolls

Modified 2 leg lift (hammies, feet and abs only – no adductors)

Wind reliever

Prep for cobra

Cobra

Moving swan

Child's pose

Sitting atlas

Head and neck rolls

Shoulder rolls

Mudra breathing

Final: biogenics

PI COMMENTS: The group did very well. They were into it from the get go.

Thursday, February 15, 2007 – Group 2
SCHOOL WAS ON A ONE HOUR DELAY DUE TO WEATHER CONDITIONS.
CLASSES REDUCED TO 40 MINUTE SESSIONS.

Savasana
Counted diaphragmatic to ratio breathing
Body rolls, rock and rolls and hip rolls
Modified 2 leg lift (hammies, feet and abs only – no adductors)
Wind reliever
Prep for cobra
Cobra
Moving swan
Child's pose
Head and neck rolls
Shoulder rolls
Mudra breathing
Final: biogenics

PI COMMENTS: No teacher was present. The athletic director was in the office, however. There was still some giggling in a few girls. The configuration was different in that none of the girls faced each other this time. It went much better. The gigglers went deeply into relaxation during the final relaxation.

Tuesday, February 20, 2007
Demonstration of full yoga breathing
Savasana

Three phase to full breathing
Body rolls/rock and rolls
Pump variation with ties
Fish
Prep for wheel
Wind reliever
Shoulder shrugs
Head and neck rolls
Cleansing breathing
Energy balancing final

PI COMMENTS: This group is consistently attentive and appears to genuinely enjoy the sessions.

Thursday, February 22, 2007 –group 1
Demonstration of full yoga breathing
Savasana

Three phase to full breathing
Body rolls/rock and rolls
Pump variation with ties
Fish
Prep for wheel
Wind reliever

Shoulder shrugs

Head and neck rolls

Cleansing breathing

Energy Balancing final

PI COMMENTS: There appeared to be fewer girls. The teacher commented that several of them were taking make-up tests due to last week's weather. Four of the girls slept soundly throughout the session.

Thursday, February 22, 2007 – group 2

Demonstration of full yoga breathing

Savasana

Three phase to full breathing

Body rolls/rock and rolls

Pump variation with ties

Fish

Prep for wheel

Wind reliever

Shoulder shrugs

Head and neck rolls

Cleansing breathing

Energy Balancing final

PI COMMENTS: The two gigglers slept throughout the majority of the class. This group is overall more giggly. They were more nervous with everything than any other group. There was not a teacher present for this group. [Male faculty member] came in and said that [School IG principal] was supposed to be there. She never showed. [Male faculty member] indicated that with the athletic director in her office (with a window open to the gym) everything was okay according to diocesan protocol. A student came in at the very end of class and took attendance.

Tuesday, February 27, 2007

Savasana

Full yoga breathing – intentional

Body rolls and rock and rolls (mentioned TBT for mid-back)

Belly burner series

Pelvic breathing

Reverse curls

Prep for wheel

Wind reliever

Cobra

Moving swan

Child's pose (low back version discussed)

Arch opener

Wide and strong/forward bend

Triangle

Warrior

Rag doll stretch

Final: extended pikopiko

PI COMMENTS: Several in the group were more interactive today. Specific questions were asked about addressing low back pain and mid-back pain. The overall energy was noticeably subdued though. When I asked [School IG faculty contact], she said that the school learned over morning announcements that the principal, [School IG principal], was in surgery today for breast cancer. No one knew about this previously.

Thursday, March 1, 2007 – group 1

Savasana

Full yoga breathing – intentional

Body rolls and rock and rolls

Belly burner series

Pelvic breathing

Reverse curls

Prep for wheel

Wind reliever

Cobra

Moving swan

Child's pose

Arch opener

Wide and strong/forward bend

Triangle

Warrior

Bending and Breathing

Owl Twist

Rag doll stretch

Final: extended pikopiko

PI COMMENTS: One girl asked specifically for suggestions for neck pain and tension. Two girls mentioned knee pain. One girl actually needs a medical referral for knee pain. She cannot bend it for child's pose. The group was very quiet with a low energy level. It was raining very hard and the energy of the group was just as damp. Anywhere between 6 and 8 girls (out of 17) were out cold at various points throughout the class.

Thursday, March 1, 2007 – group 2

Savasana

Full yoga breathing – intentional

Body rolls and rock and rolls

Belly burner series

Pelvic breathing

Reverse curls

Prep for wheel

Wheel

Wind reliever

Cobra

Moving swan

Child's pose

Arch opener
Wide and strong/forward bend
Triangle
Warrior
Rag doll stretch
Final: extended pikopiko
PI COMMENTS: Again, neck issues were mentioned when asked specifically what they wanted to work on before our six week time is complete (next week). The gigglers were definitely back! They relaxed very well though in the final relaxation.

Tuesday, February 6, 2007

Demonstration of TBT on wall for mid back tension

Savasana

10 – 1 countdown

Body rolls/ rock and rolls

Upper Cross Syndrome review

Seated: mudra breathing with ties

Neck exercises with ties

Bob King pull down with ties

Seated hip series

Cleansing breathing

Positive rest position suggestion for final relaxation

Final: special place

COMMENTS: Group is just delightful. They interact with great questions. They are willing to try anything. Very good group! About seven girls tried the positive rest position. Several questions were raised about techniques for menstrual cramping.

Thursday, February 8, 2007 – Group 1

Demonstration of TBT on wall for mid back tension

Savasana

10 – 1 countdown

Body rolls/ rock and rolls

Upper Cross Syndrome review

Seated: mudra breathing with ties

Neck exercises with ties

Bob King pull down with ties

Arm stretches

Seated hip series

Cleansing breathing

Positive rest position suggestion for final relaxation

Final: special place

COMMENTS: Girls were great, as usual.

Thursday, February 8, 2007 – Group 2

Demonstration of TBT on wall for mid back tension

Savasana

10 – 1 countdown
Body rolls/ rock and rolls
Upper Cross Syndrome review
Seated: mudra breathing with ties
Neck exercises with ties
Bob King pull down with ties
Arm stretches
Seated hip series
Cleansing breathing
Positive rest position suggestion for final relaxation
Final: full body and cellular breathing
PI COMMENTS: The girls gave me a thank you card signed by everyone and chocolate chip cookies that they made. They were very dear!

Tuesday, March 13, 2007

Savasana

Counted to ratio to full yoga breathing

Rock and rolls/body rolls

Pigeon prep series with leg stretches/twist

Sun salutation

Moon salutation

Alternate Breathing

Final: biogenics

PI COMMENTS: Very quiet today. The girls seemed tired and run down. The energy lifted somewhat with the sun salute and moon salute. Some of the girls did the final relaxation in the positive rest position. At times, felt disconnected from the girls today – as if they were off in some distant, stress filled, goal oriented land.

¹ Nancy Bloemer, *The Now River: Practical Techniques for Living in the Present Moment*. (Covington, KY: Now River Publications, 2003).

APPENDIX I : Sample Relaxation Techniques

The following relaxation techniques are copied from a book authored by the PI for the present study.¹ The techniques are presented here as examples of the relaxation techniques utilized during the intervention sessions.

10 - 1 Countdown²

I first learned this simple technique while in high school. I've since been exposed to the same procedure in hypnotherapy sessions. It is an extremely easy and profoundly effective tool for relaxation, which is why I recommend it in coping with everyday stress. With practice you'll be able to "count yourself down" to a peaceful state within a matter of seconds. I use this tool often as a precursor to meditation.

Simply stated, you begin with the number 10 and count backwards, counting yourself down to a state of complete relaxation and peace. Begin by making yourself comfortable physically. Then somehow visualize or imagine the number 10 in your mind's eye. You can write the number in the clouds in the sky of your mind, or visualize a blackboard on which to write the numbers, or perhaps visualize the numbers of an elevator, or a set of descending stairs. If visualization is not your strong suit, just think of the numbers.

With the number 10 clearly in your mind, take a moment to be aware of your current state of mind and body. Without judgment or criticism, just notice where you are and how you feel mentally, physically, emotionally and spiritually. Now as you envision the number 9, allow yourself to sink gently toward a more relaxed and peaceful state of mind and body. Rest there for a moment, then allow yourself to go deeper and deeper into a more relaxed state while moving toward the number 8. And so on. Count yourself all the way down to the number one. Allow yourself to move deeper and deeper into your peace and stillness with each descending number.

There are two numbers I use to cue specific responses within myself. When I reach the number 3, I remind myself that with this number I now release all physical distractions. For example, tightness, tension, areas of concern health-wise or perhaps distant sounds or environmental distractions. Then with the number 2, I allow myself to graciously release all remaining mental distractions. By consciously releasing physical and mental distractions with the numbers 3 and 2, I'm then ready to move to the number one where I enjoy undisturbed stillness and peace.

Sometimes with this technique, people report feelings of floating or falling from one number to the next. Don't be concerned, but do make sure your comfortable starting position is a secure one so as not to allow yourself to "fall" literally.

Rest until you feel it appropriate to move onto another activity or mini-vacation.

Progressive Relaxation³

This one is almost a cliché when it comes to relaxation methods. And there's a reason for its popularity. It works. I find it best to practice this technique lying down because of the

deep state of relaxation it can induce. Let your body come into a comfortable position preferably the sponge position or a variation thereof, adjusting yourself as necessary to find the most effective position for you. After a moment or two of intentionally quieting the mind and body with your breath, allow your attention to drift to the foundation for your entire body, your feet. Consciously allow your feet to become completely relaxed and at peace. Feel a stillness move into your toes, soles, arches and heels. It's almost as if a warm glow were filling your feet, warming and relaxing them. Allow this peace of this glow to radiate into your ankles and feel them let go of tension. Focusing on your shins and calves, invite them to move effortlessly into their peace. Feel a healing warmth surround your knees, those wonderful shock-absorbers for your body. Invite your knees into the peace and stillness where healing and restoration occur. Aware now of the warm peace moving into your thighs. Allow a deep relaxation to penetrate your skin, muscles, blood vessels, nerves, and go right to the center of the bone. Both legs are completely relaxed, profoundly at peace. Focus on your hips and allow them to become so warm and relaxed that they feel as if they are melting under you. Feel all tension and tightness associated with your hips, pelvis and low back just melt into a puddle of warmth that now supports, soothes and nurtures you. Become aware of the vital organs within your abdominal cavity. Allow a sense of peace and wellness to move into your belly. Give all your organs permission to be "at ease" and free from "dis-ease" in any form. Sense the gentle and effortless movement of your lungs. With every inhalation, consciously draw a sense of peace, wholeness and relaxation deeper and deeper into your body. And with each exhalation, intentionally release stress, tension, toxins and wastes. Now consciously surround your heart with a radiant, healing light. Invite your heart to be open, strong, loving and healthy. See it as having no blockages, either physical or emotional.

Feel radiant light moving to the base of your spine. Aware that your tail bone is warm and relaxed, allow that warm glow of peace to begin to rise up your spine. As this warmth moves upward, it relaxes and heals every vertebrae, each disc. Sense your central nervous system as it quiets and calms. Feel literally every muscle in your back relax and release tension as the warmth moves toward your shoulders. As the warmth reaches your shoulders, allow yourself to receive it as a loving embrace - a hug from the universe assuring you that you are absolutely perfect in this moment in time. Allow the assurance, acceptance and peace of this embrace to drip gently down your arms, feeling your upper arms relax, your elbows, forearms, wrists, hands, fingers and thumbs. Feel warm, radiant light streaming from your fingertips and allow this light to spin a web of peace, love and serenity around your entire body. Move your attention to your neck and notice that it is relaxed and at peace. All tension and tightness from your busy day, your busy life have drifted away. Feel your jaw become heavy, parting your lips slightly. Feel the warmth on your lips and in your mouth. Your teeth, gums, and tongue now healthy and relaxed. Sense a healing energy moving into your sinuses and nasal passages. Feel your eyelids become heavy and warm. Let all lines of concern or worry melt from your forehead. Your temples are gently massaged by fingers of warmth. Feel a peaceful warmth resting on your cheeks. Your whole face is relaxed and warm as if you were lying peacefully next to a glowing fire or relaxing in a soft, spring sunshine. Feel the warmth in your ears and be aware of it as it spreads through your entire scalp. Your whole head is relaxed. Even your hair feels warm, glowing and healthy. Allow the peace

and warmth to sink gently into your brain. That miraculous computer of yours is now quiet, calm and relaxed. Allow yourself to become immersed in your quiet stillness. Be aware of your own inner peace. Stay within the stillness and peace as long as you are comfortable. As you prepare to return, remind yourself that this inner peace is not something you need to look for or strive toward. It is already a part of you, just as natural and normal as your active state. It belongs to you. You can return to it at any time and as often as you choose. Carry it consciously with you.

Energy Balancing⁴

The origin of this mini-vacation package can be directly attributed to Dr. Brugh Joy in his book, *Joy's Way* and to The Colorado Center for Healing Touch. As presented by Dr. Joy and also in Healing Touch workshops, this is a specific healing technique for opening someone else's energy flow. I have adapted it from its original form and found it a powerful self-care tool. With this technique, you simply focus on two areas at the same time. Intend to allow the same level of stillness, peace and relaxation settle into both areas of concentration. In other words, feel the two areas move into a balanced state of peace and relaxation.

Begin by lying in a comfortable position. The sponge position is best because the body is "open" and aligned without any restrictions to the flow of energy. Now focus your attention on the soles of your feet. Invite both the right and left soles to move into the same level of peace and relaxation. Wait patiently for a sense of balance between the two feet. Focus on the left sole and the left ankle. Feel the same peace, the same stillness settling into both. Balance the left ankle with the left knee; the left knee with the left hip. Come back to the right sole and balance it with the right ankle. Balance the right ankle with the right knee; the right knee with the right hip. Balance both the right and left hips, feeling them move into an equal state of relaxation and peace. Focus on the base of the spine, the root chakra, and then the pelvic area, the space between the pubis and the belly button. The pelvis is the area of the sacral chakra. Allow both the tail bone and the pelvis to relax equally. Bring your awareness to the sacral or pelvic area and the abdominal area, the space between the belly button and the rib cage. Bring balance to both the sacral chakra of the pelvis and the solar plexus of the abdomen. Balance next the solar plexus or abdominal area with the chest or heart chakra. Move your awareness to your right wrist and right elbow. Feel the two of them relax equally. Balance the right elbow with the right shoulder. Become aware of your left wrist and left elbow. Invite them both into a balanced stillness. Balance the left elbow with the left shoulder. Feel both the right and left shoulders relax equally. Let them effortlessly settle into the same stillness. Bring your attention back to the center of the chest, the heart chakra. Balance this with the neck or throat chakra. Balance the throat with the forehead or the third eye. Balance the third eye with the crown of the head or crown chakra. About 8 - 10 inches directly above the crown of the head and in line with the spine is an energy center. Dr. Brugh Joy refers to this as the transpersonal point. In some cultures, it is considered the Higher Self. Invite a balanced peace to settle into both the crown chakra and the transpersonal point. Imagine both areas moving effortlessly into the same stillness. Then simply allow yourself to rest within this equilibrium of stillness and peace as long as you choose.

While moving through this progression, go slowly. Wait for the two areas of focus to come into balance with each other. Feel them moving into the same level relaxation and restful peace. I find a profound meditative state easily attainable with the method. Be sure to give yourself time to slowly transition to reality after this technique.

Special Place⁵

My experience over the years proves this technique as a particular favorite in yoga classes. Bring your body into a comfortable position and begin to quiet and still yourself.

In your mind's eye, imagine yourself standing at the top of a stairwell. There are perhaps ten or twelve steps leading down to a door that is now closed. Allow yourself now to slowly and deliberately descend the stairs. With each descending step allow yourself to move deeper and deeper into a state of relaxation. Feel your body releasing tension with each step downward. Feel your mind becoming more quiet and still with every slow, deliberate step. Finally you reach the bottom of the stairs feeling completely relaxed, calm and secure. In your mind's eye, reach out and open the door in front of you. Step across the threshold into a place that for you means total peace and serenity. This can be a place you've been before or one you're discovering for the first time. From the moment you enter it, you are overwhelmed with a profound peace. It's almost as if this place, this sanctuary has been waiting for your arrival. The scene is complete because you are a part of it. You feel completely welcomed and accepted here.

Feeling the acceptance and love around you, move further into the scene. Allow the door to close behind you, closing out any energies or thoughts that don't resonate with the peace you've found here. Finding a comfortable place to sit or lie or simply stroll, allow yourself to physically become aware of your surroundings. With each of your five senses one at a time, experience the peace and beauty of this place. See the vividness of the colors, the shapes, and the movements around you. This place is surely a sight for sore eyes. Bathe your eyes in its peace. Smell the scents and aromas of your sanctuary.

Those smells may even trigger tastes associated with peace. Hear the sounds of peace singing in your ears. Reach out and touch peace. Feel the shapes and textures that bring peace and tranquility to your mind and body. Feel what you're wearing, what you're standing, sitting or lying on. Sense temperature, density, tone. Know what peace "feels" like to you. Allow your physical self to become immersed in your own place of peace and tranquility. Feel, see, smell, taste, and hear your sanctuary of peace.

Allow your awareness to move beyond your physical senses to your emotional self.

Experience the emotions of peace and tranquility. Let your emotions be soothed and nurtured by everything around you. Allow yourself to be loved. As your emotional self is nurtured and soothed here, so too allow your mental self to enjoy this place. Let your thoughts be of peace. Let your mind be at peace. Let your thoughts be cleared. Feel all confusion, worry and illusion fade into the wisdom and truth of your surroundings.

Experience this place spiritually. Let your spirit soar here. Let your very soul become one with the peace, love, beauty, joy and truth of this place.

As if you were a sponge that has been dry for too long, let yourself now absorb as much

of the peace and serenity around you as you choose. You've been thirsty and now you can drink to your heart's content. Quench your physical, mental, emotional and spiritual thirst. Let this place nurture and restore you. Remind yourself that this is your sanctuary of peace. You can return to it as often as you choose, whenever you like and for whatever reason.

When you choose to leave this place, bid farewell with gratitude in your heart for what you've found here. Make your way back to the door you came in a few moments ago.

Walk through the doorway and allow the door to close behind you, securing this place for your return. Then turn and look at the stairs that brought you to your sanctuary.

Begin to slowly and deliberately ascend them. With each ascending step, feel yourself becoming more awake, aware, alert and alive. Until you finally reach the top of the stairs, feeling completely aware of your surroundings, refreshed, revitalized, relaxed and still at peace.

¹ Nancy Bloemer, *The Now River: Practical Techniques for Living in the Present Moment*. (Covington, KY: Now River Publications, 2003)

² Bloemer, 206 – 208.

³ Bloemer, 210 – 221.

⁴ Bloemer, 242 – 244.

⁵ Bloemer, 245 – 247.