

THE SUBJECTIVE WELL-BEING OF BEGINNING VS. ADVANCED HATHA  
YOGA PRACTITIONERS

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## ABSTRACT

A study was conducted to investigate the relationship between hatha yoga practice and subjective well-being (SWB) by comparing SWB levels of beginning and advanced hatha yoga practitioners. Since SWB is correlated with several variables, the most highly correlated of these variables, extraversion (E) and neuroticism (N), were controlled to prevent potential confounding effects. Thus, in addition to completing questionnaires on SWB and demographics, participants also completed measures for extraversion and neuroticism. Participants were 107 male and female adult hatha yoga practitioners recruited from various hatha yoga centers in Hawai'i. Multivariate analysis of covariance (MANCOVA) was used to analyze the effect of yoga experience on the three dependent SWB variables—life satisfaction, positive affect, and negative affect—considered together. Subsequent univariate analysis of covariance (ANCOVA) was then performed on each of the three dependent measures. As hypothesized, the advanced hatha yoga practitioners were found to have higher levels of SWB than the beginning hatha yoga practitioners—that is, the effect of yoga experience on SWB was found to be marginally significant ( $p = .0526$ ). Subsequent ANCOVA revealed that of the three dependent components of SWB—life satisfaction, positive affect, and negative affect—yoga experience was found to have a significant effect on positive affect. No interaction effects were found. The advanced and beginner yoga groups were comparable in terms of gender, education, relationship status, extraversion, and neuroticism. The two groups studied were not comparable in age, income, and ethnicity.

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## LIST OF ABBREVIATIONS

CLPW .....	(yoga) classes per week
DYCL .....	duration of yoga class
DYNCL.....	duration of non-class yoga
EPQR .....	Eysenck Personality Questionnaire—Revised
EWBS.....	Existential Well-Being Subscale
EXT.....	extraversion
MCP.....	months of continuous practice
MTP.....	months of total practice
NCLPW.....	non-class yoga sessions per week
NEU.....	neuroticism
PA.....	positive affect
PANAS.....	Positive and Negative Affect Scale
NA.....	negative affect
SWLS .....	Satisfaction With Life Scale
SWB .....	Subjective Well-Being

## CHAPTER 1 INTRODUCTION

Yoga has inspired an enormous amount of writing in popular literature in recent years. Alternative lifestyle publications, including *Natural Health*, *Heart and Soul*, and *Vegetarian Times*, and mainstream magazines such as *Time*, which highlighted yoga as its cover story for the April 15, 2001 issue, have featured numerous articles about yoga's effects on the mind, body, and spirit. But the current outpouring of publicity reflects that over the past few decades interest in this field has grown enormously. One example is the rise of *Yoga Journal*, which has blossomed from a circulation of 16,000 on its inception in 1975 to 300,000 (with an overall estimated readership of close to one million) in 2002. These and other popular periodicals and books make many assumptions about the benefits of yoga, crediting the practice with improving various aspects of physical health and psychological states, as well as increasing longevity.

How valid are the claims made by popular literature for the relationship between yoga and well-being, and how reliable are the sources? A web article marketed for popular consumption asserts that yoga promotes healthy relationships by providing yoga practitioners with insight into their relationships,<sup>1</sup> but the authors cite no studies or statistics to support their argument. Academic researchers have conducted few clinical studies to substantiate the beneficial effects of yoga, and relatively few publications exist on the subject. Although the market for yoga is booming, more empirical data is needed to bolster the scientific plausibility of yoga's effect on well-being, which is essential if yoga is to become a staple and valid element of American life, rather than just a transitory and unsubstantiated fad.

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<sup>1</sup> Downloaded August 19, 2003 from <http://www.extensionyoga.com/>



Although empirical investigations to date have produced only limited data, a number of studies suggest that hatha yoga is correlated with indicators of good physical health<sup>2</sup>. In fact, the majority of the studies reported thus far have focused on the relationship between yoga and some aspect of physical health. For example, practicing hatha yoga has been found to help control blood pressure, respiration, and heart rate (Raub, 2002); to reduce pain in several urologic conditions (Ripoll & Mahowald, 2002); and to help in the treatment of asthma (Goyeche, Abo, & Ikemi, 1982). Improved functioning of the digestive, respiratory, and circulatory systems can be expected from the practice of hatha yoga, which serves to stimulate the muscular, glandular, and nervous systems of the body (Arpita, 1991). Indeed, the physiological mechanisms of hatha yoga techniques are said to even correct and prevent disease (Dostalek, 1994; Naidoo, 1989). Because of the apparent effectiveness in helping to relieve the symptoms in diverse conditions such as coronary artery disease, arthritis, and AIDS (Telles & Naveen, 1997), yoga as a rehabilitative aid has spawned the interest of national organizations. The success and popularity of yoga in alleviating the symptoms of arthritis, for example, has led to the Arthritis Foundation's publication of a comprehensive book about yoga and other successful alternative treatments, *The Arthritis Foundation's Guide to Alternative Therapies* (Kohn & Henderson, 2002).

In some of these studies which find that yoga improves physical health, subjects also report improved psychological health—in other words, they *feel* better as a result of

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<sup>2</sup> Many of the empirical studies on yoga do not specify that it is specifically hatha yoga (physical yoga) that the authors are researching. In the current paper, all empirical yoga studies discussed will have used hatha yoga as the treatment variable.

practicing yoga. Such is the case in a study of women with hyperkyphosis (excessive curvature of the thoracic region of the spine) who participated in a twelve-week hatha yoga program (Greendale, McDivit, Carpenter, Seeger, & Huang, 1997). Other studies exploring the link between yoga and psychological health have found yoga to be directly correlated with tranquillity (Szabo, Mesko, Caputo, & Gill, 1988) and inversely correlated with tension, fatigue, and anger (Berger & Owen, 1992). Overall, practicing yoga has been found to improve psychological states through its anxiety-reducing effects and through its ability to induce relaxation (Arpita, 1991).

Psychological health is sometimes assessed through subjective well-being (SWB) people's evaluations of their own lives. These evaluations can be cognitive (e.g., a sense of satisfaction) or affective (e.g., the experience of joy). When people feel life satisfaction, frequent positive emotions, and few negative emotions, they are said to experience high SWB, also referred to colloquially as happiness.

SWB is an important dimension of psychological health because it allows individuals to decide for themselves whether they are happy. SWB does not take into account societal standards of success or objective measures of quality of life. Consequently, since SWB is both a common human desire as well as a construct believed to facilitate optimal functioning (King, 2001), a person may well be internally motivated to continue doing whatever it is that might be contributing to his or her SWB. Ostensibly, if it can be empirically shown that the practice of yoga contributes significantly to SWB, people may be persuaded to start—or continue—practicing yoga to increase SWB.

To date, there have only been two published studies in which the relationship between hatha yoga and SWB have been investigated. (These will be discussed in detail

later.) Both studies used an unfamiliar self-report measure of SWB that has not been used, discussed, or mentioned by other researchers considered to be experts in the SWB field and in both studies, the same set of researchers explored only the short-term effects of yoga. One of the two studies does not discuss how the results were obtained, and neither study controlled for confounding variables of SWB. Measuring SWB is complicated by the fact that there are several constructs that have been shown to correlate with SWB. This means that the results of any investigative study of SWB may be confounded by these covariates, unless these are statistically (or otherwise) controlled for.

This study will investigate the relationship between SWB and hatha yoga experience, specifically addressing the following question: Will advanced hatha yoga practitioners (those who have routinely practiced yoga for two or more years) score higher on SWB measures than beginning hatha yoga practitioners? In addition, I will control for the two cardinal traits, extraversion and neuroticism, that have consistently been shown to have strong correlations with SWB, as well as the demographic factors of age, gender, marital status (these have been found to have positive, though much weaker, associations with SWB), income level, education, and ethnicity. Hence, the research question which this project seeks to answer is whether advanced yoga practitioners will score higher on SWB than beginning yoga practitioners when controlling for other predictors of SWB, that is—Will yoga experience predict SWB above and beyond that predicted by other variables?

Because this project is an investigation of SWB in the context of yoga, I will

begin by describing the components of SWB and its primary correlates and then review the relevant literature on yoga. A discussion of the research question then follows.

## **Happiness**

### In search of happiness

The Dalai Lama (1999) suggests that the purpose of our existence is to seek happiness and to avoid suffering. The Third Article of the U.S. Constitution promises us the unalienable right to the “pursuit of happiness.” As long ago as the twelfth century, St. Thomas Aquinas wrote a lengthy treatise on happiness, “since it is said to be the ultimate end of human life” (Aquinas, 1964). The search for happiness seems to cross boundaries of time and culture: we desire happiness, as did our ancestors and as do our brothers and sisters around the world today.

### Demystifying happiness: Convergence on a scientific definition

When asked, most people agree that they would like to be happy. What they mean by “happy” is unclear, however, as the word has a variety of meanings in everyday usage. This confusion is not new. Aristotle, in his *Nicomachean Ethics*, long ago declared, “Both the general run of men and people of superior refinement say that [the highest of all goods achievable by action] is happiness...but with regard to what happiness is they differ, and the many do not give the same account as the wise.”

The difficulty of how to define happiness has carried over into the modern scientific arena. Because the term “happiness” lacks clarity, social psychology researchers have chosen the phrase “subjective well-being” (SWB) to indicate an individual’s personal judgment of his or her level of happiness. The latter is used to specify the social-psychological definition of happiness, while the former is used

colloquially (Diener, 2000). The terms will be used interchangeably in this proposal; when I use the term “happiness,” I mean “SWB.”

SWB is defined as how an individual evaluates her well-being, as opposed to how others evaluate it. Central to the issue of SWB are the cognitive and affective reactions to a person’s life as a whole, as well as to specific areas of her life (Diener & Suh, 1997). This means that a person is happy about specific areas such as marriage, health, and work to the extent that she thinks well of and feels good about each area. Her thoughts and feelings about her life make up the sum total of SWB. The definition of SWB allows her the freedom to decide whether her life is worthwhile (Diener, 2000).

#### Components of SWB

SWB researchers have surveyed individuals to identify the component elements of happiness according to popular understanding. Based on questionnaires and interviews, respondents generally regard happiness as consisting of “being in a state of joy or other positive emotion” and “being satisfied with one’s life” (Argyle, 2001, p. 1). Researchers often add a third component: an absence of negative emotion (Argyle, 2001). Thus, the definition of subjective well-being as determined by happiness researchers—and the one that will be used in the current work—comprises the following three components: (1) a person’s overall sense of satisfaction with his or her life; (2) positive affect; and (3) absence of negative affect. Researchers generally agree that SWB consists of life satisfaction, positive emotions, and few negative emotions.

The first of the three elements of SWB, overall sense of satisfaction with life, is an individual’s evaluation of her life up to the present time: her cognitive appraisal of how well she likes her life.

Also contributing to the definition of SWB are the two separate constructs of positive and negative affect. *Affect* refers to a person's pleasant and unpleasant moods and emotions. Positive affect is observed in emotions commonly described as joy, while negative affect seems to reflect emotions such as anger, anxiety, and depression (Argyle, 2001). Positive and negative affect are separate, independent constructs, so that a person's SWB cannot be predicted on the basis of knowing her score on only one or the other constructs. For example, an absence of negative affect alone does not equate to high SWB, since high SWB also includes the presence of positive affect and life satisfaction (Diener & Suh, 1997). High SWB is determined to the extent that a person's positive affect and life satisfaction predominate over her negative affect. Similarly, an excess of negative affect relative to positive affect and satisfaction with life would result in a low level of SWB (Bradburn, 1969; Diener & Suh, 1997). Thus, people feel happy when they experience many positive and few negative emotions, and when they feel overall satisfaction with their lives.

A counterintuitive research finding is that the intensity of positive emotion is not a good indicator of happiness over time: that is, emotional intensity and SWB are not correlated. Considering intensity and frequency of pleasant affect, what makes people happy are not momentous events—intense pleasurable experiences—but frequent occurrences of pleasant feelings. The frequency of positive emotions is a better indicator of happiness than the intensity of positive emotions; that is, one is happier over time if one has had many small positive experiences than if one has had only rare intensely pleasurable experiences (Isen, 2000).

Isen (2000) conducted research where she induced mild positive affect in subjects by giving them candy or showing them a five-minute comedy film, then compared them with control subjects who watched a neutral film. She found that the first group of subjects (those who were made to feel good) subsequently had improved thought processes, including being better at learning and memory tasks and in decision-making. She attributes the improvement to the induced positive affect.

Isen (2000) found similar results in a separate study where her subjects, a group of radiologists, were given a small present: they made more accurate diagnoses than a control group of radiologists who were not given a present. Again, in another study, employees who were made to feel good because their supervisors gave them “pleasantries” or recognized their successes were more likely to work better and harder than employees whose supervisors did not acknowledge their work. Her findings suggest that inducing mild positive affect not only makes people feel happy, it also improves their productivity. To summarize, “Feeling pleasant emotions most of the time and infrequently experiencing unpleasant emotions, even if the pleasant emotions are only mild, is sufficient for high reports of happiness” (Diener, 2000, p. 36).

#### Self-report measures of SWB

Because SWB is predominantly measured by self-report methods, it may be skewed by personal biases, cognitive misperceptions, memory failures, and so forth. The very essence of SWB is to be found in each person’s, perhaps flawed, assessment of happiness. So, by definition, people are as happy as they believe, and truthfully report, themselves to be.

Despite this potential for collecting flawed reports of SWB, research studies have indicated that self-report scales are quite an accurate measure of happiness. This is partly attributable to the moderate stability of SWB across situations and over the life span (Diener & Lucas, 2000). For example, SWB has been found to correlate 0.58 over a four-year period (Diener, Suh, & Oishi, 1997). In a study of 130 university students, Sandvik, Diener, and Seidlitz (1993) administered four self-report measures of SWB and compared their data to alternative measures of SWB to determine the construct validity, convergent validity, and temporal stability of SWB. Alternative measures of SWB included the following: written interviews by participants pertaining to their happiness; daily affect reports over a six-week period; timed tests to recall as many positive and negative life events as participants could remember; informant reports of each participant's happiness by seven different family members or friends; a social-desirability test; and measures of theoretical correlates and non-correlates of SWB.

The authors provide means, standard deviations, and reliabilities (alpha coefficients) of the various measures. Reliability for the standard self-report measures was fairly high, ranging from 0.58 to 0.96. Convergent validity was demonstrated by the self-report measures' correlations with the alternative SWB measures, which ranged from 0.68 to 0.89. The average correlation of self-report measures with non-self-report measures was 0.73. To examine long-term cross-situational consistency of SWB, family member reports were analyzed separately from reports completed by friends. This correlation was initially 0.44, but increased to 0.70 when corrected for unreliability of the informant report measures.



In a different study, SWB was also found to have high levels of stability, even when SWB was measured through two different sources, self-reports and spouse reports (Costa & McCrae, 1988). Further evidence of SWB's stability is provided by the continuity of emotional experiences across various situations: subjects' average level of positive affect at work correlated 0.70 with their average level of positive affect in recreation situations (Diener & Larsen, 1984).

Sandvik, Diener, and Seidlitz (1993) suggest that standard self-report measures of SWB are adequate for most research, as there is "a unitary core of experience for well-being, which self-reports reflect to a great extent... Thus, researchers using standard well-being scales can generally expect they are obtaining meaningful, interpretable information from these scales under ordinary conditions" (p. 337).

### Dimensions of SWB

SWB comprises two separate dimensions: internal and external. The internal dimension (also referred to as the personal or psychological dimension) encompasses personality traits (such as extraversion and neuroticism) and cognitive patterns (such as social comparison and locus of control). The external dimension (also called objective, environmental, or sociodemographic dimension) includes factors such as job satisfaction, income, and demographic variables such as age and gender.

### Control of potential confounding variables

It is important that correlates of SWB be controlled for when considering the current project's study of the association of SWB to yoga so that any significant findings of heightened SWB may be more likely attributed to yoga, rather than to SWB's covariates. A review of the SWB literature has suggested that personality may be the

primary determinant of SWB (DeNeve & Cooper, 1998). In the following section, I will discuss two personality traits, extraversion and neuroticism, since evidence of a robust relationship between each of these traits and SWB has been consistently found. Although other personality traits (such as optimism) and other factors within the psychological dimension of SWB (such as social comparison) have also been found to correlate with SWB, I will not discuss these further since their relationships to SWB have neither been found to be as strong as, nor as consistent as, the relationships of either extraversion or neuroticism to SWB.

A brief description of the association between SWB and each of several demographic variables follows. Some researchers have suggested that all demographic variables combined (such as age, marital status, gender, income, and education) account for less than 20% of the SWB variance (Campbell, Converse, & Rodgers, 1976). Some report a smaller figure: between 1% and 3.2% (Wan & Livieratos, 1978).

#### Extraversion and neuroticism

Extraversion and neuroticism are the personality traits most strongly and most consistently related to SWB (Diener & Lucas, 1999). In addition, the predictive value of both extraversion and neuroticism to SWB has been shown to have long-term stability—seventeen years—as demonstrated by Costa, McCrae, and Norris (1981). While extraversion (E) is positively related to SWB, the correlation between neuroticism (N) and SWB is negative (e.g., Argyle, 2001; Costa & McCrae, 1980; Emmons & Diener, 1985; Myers, 1992).

E is “one of the best predictors” of SWB, according to Argyle and Martin (1991, p. 92) who found that the correlation between E and SWB was 0.48, and 0.46 in an

earlier study (Argyle & Lu, 1990). Speculations as to why extraverts have been consistently found to report greater happiness than introverts include the following: a difference in brain structures makes extraverts more responsive to rewards (and conversely, introverts more responsive to punishment); extraverts are more influenced by positive mood induction; and extraverts experience more joy from their more frequent social interactions (Argyle, 2001).

Some researchers have found N to be a better predictor of SWB than E. From a sample of 461 survey and telephone interview respondents, Vittersø and Nilsen (2002) measured E, N, and the components of SWB (life satisfaction, positive affect, and negative affect). They used structural equation modeling to estimate the associations between each of the personality traits and SWB, and found that N explained eight times as much of the SWB variance as did E (N accounted for 24% of the variance in SWB, while E accounted for 3% of the SWB variance). In another study, Lu (1996, 1999) found that while N had a direct effect on SWB, E was only indirectly related to SWB<sup>3</sup>. Argyle (2001) reported a correlation of  $-0.67$  between N and SWB and a slightly smaller correlation of  $0.61$  between E and SWB. In a meta-analysis investigating 137 different personality correlates of SWB, DeNeve and Cooper (1998) found that N was the best predictor of SWB ( $r = -0.22$ ); the correlation between E and SWB was a smaller  $0.17$ .

The mechanism underlying the impact of E and N on SWB was studied by Costa and McCrae (1980), who examined the relationship of two components of SWB (positive and negative affect) to seven personality dispositions (general emotionality, fear, anger, impulsivity, sociability, tempo, and vigor). Using factor analysis, they found that the personality dispositions clustered into the two separate dimensions of personality, E and

N. E was found to predict the experience of positive emotions (hence, the positive relationship between E and SWB), while N was found to predict the experience of unpleasant emotions (hence, the negative association between N and SWB).

As discussed in a previous section, positive affect and negative affect form independent constructs virtually unrelated to each other (Bradburn, 1969), though each is a predictor of SWB. Accordingly, in Costa and McCrae's (1980) study, while E seemed to predispose individuals toward pleasant emotions, E did not diminish negative emotions. Similarly, N directly affected the experience of unpleasant emotions although it had no effect on reducing pleasant emotions. Based on their findings, the authors support a model of happiness with two separate personality dimensions (E and N) influencing positive and negative affect separately, as described in the following passage:

Low N introverts and high N extraverts may have similar levels of life satisfaction or happiness, but they achieve this result in utterly different ways. The former are seldom depressed but just as seldom elated. The latter are prone to both extremes and reach "average" satisfaction only because there is as much satisfaction as dissatisfaction in their lives. (Costa & McCrae, 1980, p. 676)

Accordingly, the relationships between N and negative affect, and between E and positive affect, are quite a bit stronger than the relationship between either E and SWB or N and SWB. In other words, although N predicts negative affect, SWB levels cannot be accurately predicted on the basis of knowing only N, since SWB is also mediated by positive affect and life satisfaction. Hence, while Vittersø and Nilsen (2002) found that N accounted for 24% of the SWB variance and E accounted for 3% of the SWB variance, the correlations are much higher when looking at the specific SWB components of

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<sup>3</sup> Lu (1999) found that the impact of extraversion on SWB was mediated by social support.

positive and negative affect. In this same study, N accounted for 56% of the variance in negative affect (compared with only 24% of total SWB variance) and 26% of the variance in positive affect (but only 3% of the total SWB variance).

### Marital Status

Several sources maintain that marriage shows consistent positive correlations with SWB (e.g., Argyle, 2001; Diener & Lucas, 2000; Veroff, Douvan, & Kulka, 1981). For example, Veroff, Douvan, and Kulka (1981) found that married individuals were approximately twice as likely as single and divorced people to report being “very happy” with their lives. Similarly, being married seems to put people at considerably less risk for mental illness, as demonstrated by Cochrane (1988), who found married people to be far less likely to be admitted to a mental hospital than single, widowed, or divorced individuals.

Research findings on the magnitude of the marriage-SWB relationship have sometimes been very weak. For example, a meta-analysis of 58 empirical studies investigating the relationship between marital status and SWB revealed that being married was positively and significantly correlated with SWB (Haring-Hidore, Stock, Okun, & Witter, 1985). However, this correlation only amounted to 0.14 and marital status was found to account for only 2% of the variance in SWB. In addition to being weakly related to SWB, other researchers have found marital status to be inconsistently related to SWB (Lewinsohn, Redner, & Seeley, 2000). The marriage-SWB correlation seems to be slightly stronger with younger adults compared with older adults, with married men more than with married women, and in past decades compared to more recent years (Haring-Hidore et al., 1985).

## Age

Findings on the relationship between age and SWB have yielded contradictory conclusions. Some researchers find a consistently positive relationship between age and SWB, with older people experiencing more satisfaction than younger ones (Argyle, 1999; Lewinsohn, Redner, & Seeley, 2000). Specifically, older respondents have been found to report experiencing less negative affect than younger respondents (Barrick, Hutchinson, & Deckers, 1989; Charles & Reynolds, 2001; Kunzmann & Little, 2000). Speculations as to why SWB may increase with age include the following: people learn to better regulate their emotions as they get older (Carstensen, 1991); emotional intensity—including negative emotions—decreases with age; the goal-achievement gap diminishes with age (Campbell, Converse, & Rodgers, 1976); and negative emotions seem to abate as older adults attempt to restructure their lives to maximize positive interactions and minimize negative ones (Carstensen, 1995).

However, some researchers have found that SWB levels start to decrease once people advance beyond 65 years (Chen, 2000) or 70 years of age (Horley & Lavery, 1994). Similarly, in the Charles and Reynolds (2001) longitudinal study of four generations of families, although positive affect remained stable over time, there was a small but significant decrease in positive affect for the oldest participants in the study. Researchers suggest that the decrease in SWB levels of the elderly may be attributed to declining health (Horley & Lavery, 1994) and major life events such as divorce and retirement (Chen, 2000).

Some researchers have found no significant differences in SWB as people age. Based on the data of two cross-sectional surveys conducted five years apart (1971 and

1976), Herzog and Rodgers (1981) found that SWB levels of 5000 respondents remained fairly constant between the ages of 25 and 75. In another large-scale study across forty nations, Diener, Suh, and Oishi (1997) found that the SWB levels of different age groups “hardly differed.”

Perhaps some of the inconsistent findings derive from the different component(s) of SWB being measured by different researchers. Many of the SWB-age relationship findings indicate that with age, one can expect a decline in negative affect (resulting in a corresponding *increase* in SWB), as well as a decline in positive affect (resulting in a corresponding *decrease* in SWB). It seems to depend on which of the three components of SWB is measured. In summary, the SWB literature seems to indicate that the correlation between age and SWB is weak, at best.

### Gender

Gender differences in SWB levels have generally been found to be weak and inconsistent (Diener, Suh, & Oishi, 1997; Larson, 1978; Lewinsohn et al., 1991), with women experiencing slightly more positive and more intense emotions than men (Nolen-Hoeksema & Rusting, 1999). In addition, women, rather than men, are more likely to become clinically depressed<sup>4</sup> (Argyle, 2001). Some studies also suggest that men grow happier with age, eventually surpassing SWB levels of women (Argyle, 2001; Mroczak & Kolanz, 1998).

### Counterintuitive findings: What does not contribute to SWB?

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<sup>4</sup> That women are more likely to become depressed does not contradict the finding that women experience greater happiness than men because the number of clinically depressed people is a small proportion of the total number.

Many factors that we commonly believe contribute to happiness do not have as much impact on happiness levels as we think they do. Studies have found that objective life circumstances (such as intelligence, physical attractiveness, and wealth) contribute five percent (Schwarz & Strack, 1991) to fifteen percent (Diener & Lucas, 2000) of the variance in SWB scores. Counter-intuitive research findings consistently suggest that happiness is not correlated with external factors such as wealth and sudden good fortune. For example, we might expect the wealthy to be happier than the poor, but in North America and Europe, the correlation between happiness and income level is almost zero. The wealthiest people—the Forbes 100 richest Americans—are “only slightly happier” than average Americans (Myers, 2000, p. 59). Happiness has only been found to correlate with wealth in extremely poor countries where citizens are not getting their basic needs, like food and shelter, met (Myers, 2000).

Similarly, despite the expectations that sudden good fortune should cause happiness to skyrocket and sudden tragedy should cause happiness to plummet, research studies indicate that external circumstances hardly have any impact on SWB. Brickman, Coates, and Janoff-Bulman (1978) investigated individuals who suddenly became wealthy lottery winners and other individuals who suddenly became paralyzed. Lottery winners experienced a temporary high from their winnings, but their thrill soon faded and their SWB levels sank back to original levels. SWB levels of individuals paralyzed by spinal cord injuries took an initial plunge, but then returned to pre-accident happiness levels. In another study, Schwarz and Strack (1991) interviewed patients who had undergone cancer operations as well as other individuals who were healthy. He found that three years after cancer operations, patients were happier than the healthy controls. Thus,



while intense positive emotion in the lottery winners and intense negative emotion in the accident victims and cancer patients were clearly evident immediately after the changing life events, within a few months, each group experienced a return toward baseline levels of happiness commonly experienced by most people (Diener, 2000).

The implication of these findings is that while people commonly expect external influences, such as winning the lottery or becoming paralyzed, to increase or decrease their SWB levels, these factors do not impact their lives permanently. People experience temporary emotional peaks and valleys, but becoming wealthy does not induce long-lasting happiness; and becoming paralyzed does not permanently reduce pre-accident happiness levels.

In their classic study, Brickman and Campbell (1971) proposed that people operate on a “hedonic treadmill.” People do indeed experience intense highs following pleasant life-changing circumstances, but in adapting to these changes, their expectations also rise, they habituate to the new level, and soon their SWB levels return to earlier happiness levels. In fact, because human beings tend to habituate to success, it takes more and more effort to sustain the same level of happiness over time. Myers (2000) notes that from 1957 to 1998, the inflation-adjusted average income increased from \$8,000 to \$20,000. One might expect that happiness levels would progressively increase over time, but this was not the case. In fact, the number of subjects (one-third) who indicated that they were very happy in 1957 remained constant forty years later, even though their spending power had more than doubled. Hence, according to the hedonic treadmill theory, heightened SWB levels cannot be permanently found in sudden momentous good fortune.

### What else makes us happy?

Other variables showing somewhat consistent positive associations with SWB include: optimism (Wrosch & Scheier, 2003); self-esteem (Schimmack & Diener, 2003); social comparison (Lyubomirsky, 2001); religiosity (Pargament, 2002); and genetics (Lykken & Tellegen, 1996). To a lesser extent, researchers have also found SWB to have positive associations with the following constructs<sup>5</sup>: conscientiousness (Hayes & Joseph, 2003); gratitude (Emmons & McCullough, 2003); self-acceptance (Makino & Tagami, 1998); identity consistency (Suh, 2002); personal control (Löck, 1990); goals (Sheldon & Kasser, 2001); having close relationships (Myers, 2000); participating in leisure activities (Argyle, 2001); job satisfaction (Argyle, 2001); and being engaged in *flow* (absorption in a challenging work or leisure activity) (Csikszentmihalyi, 1990, 1999).

## **Yoga**

### Antiquity of yoga

The philosophy and practice of yoga date back to ancient times, originating perhaps as early as five thousand years ago. Sources disagree on the date of its genesis, with Western analysts tending to underestimate its antiquity, and Indian scholars to magnify it (Feuerstein, 1989). The limited archaeological evidence indicates yoga existed in the Indus civilization, which dates back to at least the third millennium BCE, and possibly as far back as the middle of the seventh millennium BCE (Feuerstein, 1997). Archaeological findings from the Indus civilization, in the form of terra-cotta seals, reveal inscriptions with reference to yoga and figures in seated yoga postures (Koller, 1982). In addition, the evidence suggests that the practices of the Indus people may have

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<sup>5</sup> Some of these constructs have only been investigated in a single study and should not be regarded as definitive correlates of SWB.

been similar to yogic practices: they were pollution-conscious; engaged in purification rituals; and the absence of weapons in the sixty excavated sites suggests they practiced *ahimsa* or non-harming/non-violence, one of the basic tenets of yoga (Feuerstein, 1997).

Yoga's antiquity is also suggested by the *Bhagavad-Gita*—composed between the third and fourth century BCE (Feuerstein, 1989), or possibly during the fifth century BCE (Radhakrishnan, 1948)—which already regarded yoga an ancient tradition. The earliest known reference to yoga appears in the *Rig-Veda*, the oldest of the four Vedic collections, whose origin dates back to at least 1000 BCE (Maurer, 1986), possibly even as early as 3000 BCE (Feuerstein, 1997).

#### Demystifying yoga: What is it?

No one knows of a single Indian spiritual movement that is not dependent on one of the numerous forms of yoga...In the final analysis, a major part of the history of India is in fact constituted by the history of the multiple forms and aspects of what is called yogic practice. (Eliade, 1975, p. 5)

The word “yoga,” derived from the verbal Sanskrit root *yuj*, has had many applications, both historically and at present: the Sanskrit dictionary offers more than thirty definitions (Johnson, 1982). The root *yuj* is commonly translated as “to yoke,” as in yoking the powers of body, mind and soul to God (Iyengar, 1979), or in yoking human effort “for the aid of the divinity” (Eliade, 1958, p. 5). It also means “to unite,” as in uniting our will with the will of God (Iyengar, 1979), or the human soul with God (Eliade, 1958).

According to Johnson (1982), the original use of the verb was “to harness horses to a chariot” (p. 9). The word yoga was most likely introduced before 1500 BCE on the

Indus plains when Indo-Aryans on battle chariots invaded Harappan civilizations. Back then, setting up battle chariots was enormously difficult since it involved harnessing wild horses to chariots before harnesses and horse collars had been invented. The charioteer who harnessed the horses and drove the chariot became such a highly respected, admired, and prominent figure that, in later Hindu culture when the Hindu god, Vishnu, sought to combat evil on earth, he chose to incarnate as Krishna, the famous charioteer to Arjuna, as depicted in the *Bhagavad-Gita*. The charioteer's skill at harnessing horses and driving the chariot were encapsulated in the Sanskrit root *yuj*. The charioteer's skill is what constituted his *yoga*, the self-discipline that led to the expertise of his profession. In essence, the historical use of the term *yoga* was based on a skill "in which one trains oneself, harnessing some previously uncontrolled forces, in order for their powers to enhance the success of some undertaking or adventure...more than an end in itself [*yoga*] is a means to whatever end one chooses" (Johnson, 1982, p. 11).

#### Why yoga?: The doctrine of original ignorance

Yoga exists on the premise that human beings lead never-ending lives of pain and suffering. We are born, we suffer, we die, and the process begins anew. Souls, unable to escape the death of their physical bodies, are reincarnated to new bodies, perpetuating *samsara*, the cycle of suffering and bondage characteristic of the phenomenal world.

According to Patanjali's *Yoga Sutras*, we are bound to this state of suffering because of *avidya*, the doctrine of original ignorance, through which we believe reality to be made up of the things we see, hear, feel, taste, and touch—the phenomenal or material world as our senses perceive it (Raju, 1961). More than simply the absence of knowledge, *avidya* is a basic misconception about the nature of reality (Feuerstein, 1997).

In this state of profound metaphysical ignorance, mistaken self-identity and lack of understanding about the essence of true existence lead humans to identify with superficial, worldly modes of being (Koller, 1982).

The conceptual framework of yoga philosophy is so closely connected to the philosophical system of *samkhya*<sup>6</sup> that both are often mentioned together, as *samkhya-yoga*. Samkhya-yoga discriminates between two principles: *purusha* and *prakriti*<sup>7</sup>. Prakriti has been defined as matter (Rao, 1995) or the objective material manifestations of reality (Rakesh, 1981), which is the world as we know and experience it, as well as the substance and structure of consciousness. Purusha, the subjective or spiritual aspect of reality (Rakesh, 1981), is “pure consciousness, unembodied, uncaused, eternally unchanging, and completely unaffected by experience” (Koller, 1982, p. 178).

The distinction between these two modes of being is likened to operating in a transcendental versus an empirical dimension, or on an absolute versus a relative plane of existence (Rakesh, 1981). Prakriti represents the manifest realm of nature accessible to the five senses and refers to whatever can be an object of experience, whereas purusha is the “power of awareness” (Feuerstein, 1997, p. 236), the state in which everything apprehended is simply witnessed.

Some scholars use the analogy of a lower self (*prakriti*) and a higher Self (*purusha*) differentiating the two with a lower-case “s” and capital “S.” The two separate realities are not linked; rather, a gradual evolution takes place, in which *prakriti*, the lower self, awakens to *purusha*, the higher, transcendent Self (Feuerstein, 1997; Koller,

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<sup>6</sup> Like yoga, samkhya is one of six historical philosophical schools of Hinduism. The term “samkhya” has been translated as “number” (Feuerstein, 1997) and “discrimination” (Eliade, 1958) in reference to samkhya authorities’ delineation of the twenty-five categories of existence. Other (metaphysical) meanings of the term samkhya include “insight” or “investigative understanding” (Feuerstein, 1997).

1982; Raju, 1961). The samkhya model serves as a kind of map for the *yogin* (a person who practices yoga) who seeks to proceed in consciousness from the external to the internal (Feuerstein, 1997).

#### Liberation of humankind from ignorance

According to Eliade (1958), human suffering derives from this metaphysical ignorance—that is, confusing prakriti with purusha, or mistaking the phenomenal material world for true reality. Central to yoga philosophy is the concept of liberation or *moksha*, which can only be attained if the prakriti/purusha confusion ceases.

Because of this metaphysical ignorance, the potential power to transform human existence remains hidden or undiscovered. This transformation is what constitutes moksha (variously called liberation, Self-transcendence, Self-realization, salvation, emancipation, enlightenment). Moksha consists of transcending the known self and surpassing the ego's limitations to recover "one's authentic identity as the transcendental Reality [purusha], rather than the ego personality [prakriti]" (Feuerstein, 1997, p. 266). Through moksha, the self is freed from the bonds of ingrained, habitual patterns, unawareness, the boundaries of the body-mind, and the forms and illusions of the cosmos—all characteristics of prakriti. Arriving at Supreme Knowledge (purusha) is not simply the end of ignorance, but also freedom from pain and suffering (Eliade, 1958). Liberation is the process in which awareness of the true Self emerges (i.e., the unfolding of awareness from original ignorance), revealing that the empirical self (prakriti) and ultimate Reality (purusha) are joined.

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<sup>7</sup> Purusha and prakriti are the two principal categories of samkhya's twenty-five categories of existence.

Only when one realizes that human existence derives from a deeper level of reality, and that all lower levels of existence spring from this higher Reality, is a person liberated from the cycle of innumerable deaths<sup>8</sup> (Koller, 1982). Most scholars believe that this joining of (lower) self to (higher) Self is not a linking of two separate realities but a pre-existing state, an awakening or discovery of what was already there, the realization of a singular essence of Selfhood (Feuerstein, 1997; Koller, 1982; Raju, 1961).

The liberated *yogin* arrives at this point only after a long struggle with the human condition in which he or she has come to terms with the nature of reality (i.e., when the yogin has understood the truth regarding the nature of prakriti and purusha). Having transcended the reality of the ego/self and the empirical world, the yogin views humanity with patience and compassion and can help others on their paths toward liberation.

### The Way of Yoga

As discussed earlier, the term “yoga” comes from the Sanskrit root *yuj*, meaning “to yoke” or “to harness,” from its original usage which meant “to harness horses to a chariot.” Yoga is ultimately the tradition of spiritual self-discipline and practice for the pursuit of liberation/enlightenment (Feuerstein, 1997). More specifically, through yoga, a person learns to harness, develop, and use the energies and power he or she experiences at a lower level of existence (prakriti) in such a way that these become the means for transcendence to a higher level of existence (purusha). At this higher level, those same

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<sup>8</sup> Awakening to the knowledge of the higher Self (purusha), however, is not a discovery of an eternal state of blissful rapture—as is popularly conceived, especially by the term “enlightenment”—because the Self cannot be experienced as such, and pleasure and pain belong to the world of the embodied self (prakriti). The popular belief is that enlightenment is equated with bliss in a juxtaposition to the pain experienced by the empirical self. The enlightened Self does not participate in the experiences of the manifest world, meaning it experiences neither pleasure nor pain. It only witnesses these with detached inclination (Feuerstein, 1997), much like a “huge eyeball,” simply surveying life without actually being involved in it (Koller, 1982).

energies and powers can become self-illuminating, unveiling the totality of ultimate reality (Koller, 1982).

### Hatha yoga

The origins of hatha yoga, like the roots of yoga in general, are obscured by the lack of existing historical literary material. Little is known about the antiquity of the actual practices that comprise hatha yoga. In fact, no evidence suggests that there was even an oral tradition passed on to succeeding generations through a teacher-student lineage (Cushman, 1999).

Some scholars speculate that hatha yoga, “physical” or “forceful” yoga, has its roots in Tantrism which views the human body as a vehicle for Self-realization. In pre-Tantric times, the body was regarded as “a source of defilement, the enemy of the spirit”: the body was loathed but tolerated for its function as the receptacle of the spirit (Feuerstein, 1989, p. 278). With the advent of the Tantric revolution, a new attitude was espoused, with the body perceived as both necessary and good. No longer the source of suffering and misery the body was regarded as a dwelling for the divine and liberation/enlightenment came to be viewed as not simply a spiritual concern, but rather an integrated body-mind event, preparing the groundwork for hatha yoga’s view of the celebrated body.

Hatha yoga refers to traditional techniques aimed at mastery over the body (Rao, 1995). The essence of hatha yoga is exemplified in the importance of cultivating a “yogic body,” free from disease and limitation, to harness and channel psychospiritual energy for the purpose of achieving liberation. In fact, embodiment is believed to be a genuine advantage in the pursuit of liberation, and enlightenment is thought to have definite



bodily repercussions: The yogic body is purported to be endowed with super senses and powers that extend beyond the constraints of the normal person (Feuerstein, 1997).

Most hatha-yoga manuals contain prescriptions for a yogic lifestyle—self-purification, nourishment, and *asana* (prescribed bodily postures or poses). One such popular classical text, the *Yoga Sūtras of Patañjali* (Patañjali’s “Aphorisms on Yoga”), produced between the second century BCE and the early Common Era, is a compilation of existing teachings on yoga (Feuerstein, 1997). It is best known for the “eight limbs of yoga,” which delineate eight constituent categories for the yogic path. Patañjali’s eight limbs of yoga include: (1) *yama* (moral restraints, such as non-violence and non-stealing); (2) *niyama* (self-purification by discipline, such as cleanliness and self-study); (3) *asana* (yogic posture); (4) *pranayama* (regulation of the breath energy); (5) *pratyahara* (sense withdrawal); (6) *dharana* (concentration); (7) *dhyana* (meditation); (8) *samadhi* (ecstasy/enstasy). Of these, we will discuss *asana* and *samadhi*, because *asana* has become virtually synonymous with hatha yoga in the West, and *samadhi* is the endpoint of the yogin’s path.

### Asana

Asanas seem to have no solid tradition from which they were derived, having evolved and proliferated such that the numerous asanas practiced in yoga classes today bear little resemblance to the few depicted in the classical hatha yoga sourcebooks. The *Yoga Sūtras of Patañjali* only mentions the seated meditation posture (Cushman, 1999); the *Hatha Yoga Pradipika* mentions fifteen different asanas, though most are variations on the seated meditation posture (Rieker, 1971); the *Gheranda Samhita* lists thirty two asanas, though also mostly sitting postures (Cushman, 1999). “Conspicuously missing

[from the documented texts] are the standing poses—Triangle, Warrior, etc.—and Sun Salutations that form the backbone of most contemporary systems” (Cushman, 1999, p. 46). It does seem to suggest, Cushman (1999) speculates, that asanas also drew from such diverse traditions as Indian wrestling and gymnastics. Still, the popularity of an asana practice, and hatha yoga as a whole, has not suffered from its less than puritanical origins. The third of Patanjali’s “eight limbs of yoga,” asana has become a widely-practiced yoga technique.

The most common translation of the term *asana* is yogic posture or pose. Asanas are practiced barefoot, preferably on wood floors, or at least on an uncarpeted surface, either standing, sitting, or lying down. Most of the standing poses are fairly rigorous isometric exercises performed against a wall or on the floor. Seated and lying-down poses primarily stretch out various large muscle groups. A person can come to a hatha yoga class (typically, the focus is on asanas, not on nourishment, self-purification, meditation, or any of the other aspects of hatha yoga) solely for the physiological benefits, which include strength, balance, and flexibility. According to Iyengar (1979), asanas systematically stretch and exercise all the muscles, nerves, and glands in the body, and serve to reduce fatigue and soothe the nerves.

Depending on the particular hatha yoga school one follows and the individual’s level of practice, each asana is held for a few breath cycles—up to about two minutes—although more advanced yoga practitioners hold some poses for ten minutes. During each posture, attention is directed to the breath—to the deep, in-out, rhythmic sensation—and awareness is brought to the area of the body that is being stretched or strengthened. The yoga practitioner simply observes, suspending judgment, the physical or psychical

sensations and emotions arising. The asanas are interspersed with brief moments of relaxation during which the yoga practitioner keeps trying to redirect, or maintain, a focus inward (Arpita, 1991). Refer to Appendix A for illustrations and purported benefits of five different asanas. The first three poses illustrate basic asanas that are regularly taught in both beginning and more advanced yoga classes, while the latter two poses depict more advanced asanas.

Asanas are a series of disciplined, rigorous bodily postures and breathing exercises which should be, according to Patanjali's *Yoga Sutras* (II.46), *sthira-sukham*, or steady and comfortable/agreeable. At first, asanas are "uncomfortable and even unbearable" (Eliade, 1958, p. 53), but with practice, the effort that goes into maintaining such a practice becomes minimal, even effortless. Koller (1982) describes the aim of an asana practice is to:

[bring] the body under the control of consciousness instead of allowing it to control consciousness. Controlled by consciousness, the body can become a vehicle of liberation rather than of bondage. The various postures must be practiced until they become totally effortless. At first one's entire attention is focused on the bodily postures, but as control increases it becomes possible to completely transcend bodily awareness. At this point bodily activities no longer constitute conditioning factors of consciousness, for freedom from the physical support system has been achieved. (p. 184)

The conceptual framework is the same in Patanjali's *Yoga Sutras* (I.2): *yogah chitta vritti nirodhah*, that is, yoga is the restraint of the fluctuations of consciousness. Stilling the fluctuations of consciousness—incessant mental activity or constant stream of

thoughts—is not an easy task. While manipulating the body and making minute, detailed adjustments to perfect each asana, a person must concentrate. Such attention to each asana is necessary so that the yoga practitioner develops “one-pointed” concentration—ceasing to become distracted by other thoughts<sup>9</sup>. As in the sutra above, the “fluctuations of consciousness” are restrained by one-pointed concentration (*ekagrata*) on each asana. Eliade (1958) explains that, in the practice of asana,

One realizes the first stage toward isolation of consciousness...On the plane of the “body,” *asana* is an *ekagrata*, a concentration on a single point; the body is “tensed,” concentrated in a single position. Just as *ekagrata* puts an end to the fluctuation and dispersion of the states of consciousness, so *asana* puts an end to the mobility and disposability of the body, by reducing the infinity of possible positions to a single archetypal, iconographic posture...Refusal to move (*asana*), to let oneself be carried along the rushing stream of states of consciousness (*ekagrata*), will be continued by a long series of refusals of every kind. (pp. 54-55)

During the practice of asana, with concentration solidly fixed on each yogic posture, the yogin transcends the worldly mode of existence: he begins to operate autonomously with regard to the phenomenal material world; pleasure and pain no longer agitate him; sensory activity ceases to drive him toward the objects of his senses; and the mental flow of distracted, automatic activity is suspended (Eliade, 1958).

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<sup>9</sup> Instructions for a single pose in an Iyengar yoga class (a style of hatha yoga) are detailed and substantive, and this requires practitioners to pay attention to minute details in the placement of different body parts against a wall, on the floor, or in the air. Typical instructions for an asana, such as Downward Facing Dog, might flow as follows: “Place the feet hip-width apart and press the big toe mounds down. Stretch through the inner feet, from the base of the big toes and inner ankles, up through the inner knees, inner thighs, to the groin. Press the shinbones backwards. Use your thigh muscles to embrace your thigh bones, rotate the thigh muscles inwards, and extend them up and backwards,” and so on.

## Samadhi

As the mind effortlessly and uninterruptedly flows towards the object of concentration (such as an asana) for an extended period of time, this leads to *samadhi* (Rao, 1995). Samadhi has been translated as “ecstasy” by many authors (e.g., Becker, 2000; Feuerstein, 1997); a few others prefer the term “enstasy” (e.g., Eliade, 1958) or “absorption” (e.g., Rao, 1995). Samadhi is the eighth limb of Patanjali’s “eight limbs of yoga.” It is the final point of the yogin’s quest, the end result of all the yogin’s spiritual efforts and physical exercises, the condition he arrives at after all mental fluctuations have been stilled and the yogin is devoid of any content of consciousness. Samadhi has been described as the complete merging of the subjective consciousness (the yogin’s “thought”) and the object of focus (such as an asana). It is the condition whereby the subject-object distinction is lost. In samadhi, one’s body and senses are quieted “as if he is asleep” (Iyengar, 1979, p. 52), yet he remains fully awake and alert, his energies directed onto the object of his attention.

Samadhi is characterized by complete absorption, in which the yogin’s thought directly grasps the form of the object without the interference of the mind’s evaluations of, preconceptions about, illusions regarding, and imaginative storytelling around the object. Samadhi is the condition in which the object is revealed in itself or seen as it is in its entirety, in its absolute form. This absorption is so undivided—the yogin is so involved in the object of contemplation—that nothing can distract him from his focus. This is described in the *Hatha Yoga Pradipika* (IV.108-110):

The Yogi, engaged in Samadhi, feels neither smell, taste, color, touch, sound, nor is conscious of his own self.

He whose mind is neither sleeping, waking, remembering, destitute of memory, disappearing nor appearing, is liberated.

He feels neither heat, cold, pain, pleasure, respect nor disrespect. Such a Yogi is absorbed in Samadhi.

The essence of samadhi is a stillness of body and mind and the blossoming of awareness due to an understanding of the true nature of reality.

Recall the discussion of asana from the previous section: the purpose of practicing asanas is to focus one's concentration on the body in each pose. As the poses gradually become the person's sole focus of contemplation, external objects lose their hold on her attention. As she develops one-pointed concentration on her asanas, she is also progressing towards that final point of samadhi. When samadhi has been maintained, the person is said to have become liberated—the union of the lower, individual self with the higher, transcendental Self has been achieved.

### Yoga in the West

The body is of primary concern to hatha yogins, as evidenced by the asanas illustrated in classical documents. Accepted as part of the spiritual journey, the hatha-yogin's focus on the body is celebrated—a value that is readily imported to Western countries, where obsession with physical fitness and appearance can be justified in the pursuit of enlightenment. In the West, asana has become almost synonymous with yoga.

The popularity of hatha yoga in the West is demonstrated not only by the sheer number of practitioners, but also by the proliferation of several different “schools” of hatha yoga that teach different styles or emphasize specific aspects of asana, or hatha-yoga as a whole. Examples of different hatha yoga schools include: Iyengar Yoga, a

precise and dynamic approach, with emphasis on alignment and symmetry; Ashtanga Yoga, arguably the most physically demanding of the hatha yoga styles, whose practitioners perform the same sequence of 26 asanas in each class; Viniyoga, whose emphasis on breath makes for a slower-paced practice; Kundalini Yoga; Kripalu Yoga; and so forth (Carrico, 1997), each style emphasizing different approaches as a pathway to samadhi.

It has been argued that hatha yoga in the West barely resembles its original ancient Indian form. Some might argue that yoga has been modified, packaged, and repackaged: that comparing the American brand of “yoga” to its original state is like comparing bottled ketchup to fresh tomatoes. Nevertheless, Indian gurus, such as Krishnamacharya, who were responsible for the spread of yoga to the West in the early 1900s, insist that a yoga practice must be tailored to suit the needs of the individual (Whitwell, 1995), and likewise, the needs of individual cultures, hence validating yoga’s many newly-emerging variations. According to Cushman (1999), this recently-developed diversity demonstrates yoga’s infinitely creative nature: its multitude of expressions is an indication of an ancient tradition’s ability to re-create itself to meet the needs of various times and cultures. Whether we aspire to enlightenment by transcending the individual self through meditating, renouncing worldly pleasures, or concentrating on our bodies while practicing asanas should not make a difference to the spirit and effectiveness of yoga—though we may be inspired to choose somewhat variant practices, we should all be able to make the journey there just the same.

### Effects of hatha yoga on physiology

Most of the experimental studies investigating yoga have focused on hatha yoga, and in these studies research has primarily emphasized the link between yoga and physiology.<sup>10</sup>

Several studies have found hatha yoga to have positive physiological effects. For example, a controlled study of 101 older adults (ages 60 to 83) were randomly assigned to aerobics, yoga, or a waitlist control group (Emory & Blumenthal, 1990). Assessments included measures of physiological functioning, psychological well-being, and cognitive functioning. After sixteen weeks, participants completed a self-report measure of perceived change, which included items such as sleep patterns, energy levels, bowel patterns, memory, concentration, and loneliness. Participants in the yoga and aerobics groups reported significantly greater improvement compared to the wait-list participants on seventeen of the nineteen indicators of perceived change (on all items except for eating habits and body weight).

In another study, comparing eight advanced hatha yoga practitioners with eight control subjects matched for sex, age, and height, statistically significant results indicated that the yoga group's pattern of breathing was characterized by greater tidal volume, lower ventilation, and slower rate of breathing than the control group (Stanescu, Nemery, Veriter, & Marechal, 1981).

Elson, Hauri, and Cunis (1977) compared eleven yogic meditators during a forty-minute meditation with matched control subjects who were instructed to remain

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<sup>10</sup> A much smaller proportion of the yoga studies explored the connection between yoga and psychological states. There were also a few studies investigating the link between yoga and various other subjects, such as: scholastic achievement (Barnes & Nagarkar, 1989); social adaptation of mentally retarded children



“wakefully relaxed” for forty minutes. Physiological changes in the yogic meditators included an increase in basal skin resistance (BSR) and a decrease in respiratory rate, whereas the control subjects experienced decreased BSR and an unchanged respiratory rate.

Additionally, numerous studies have investigated the therapeutic effects of yoga on various diseases, disorders, and dysfunctions, and have found yoga to be associated with improvement of the following conditions: urologic disorders (Ripoll & Mahowald, 2002); musculoskeletal and cardiopulmonary disease (Raub, 2002); coronary artery disease (Schmidt, Wijga, Von Zur Mühlen, Brabant, & Wagner, 1997; Telles & Naveen, 1997); hyperkyphosis—excessive curvature of the spine (Greendale, McDivit, Carpenter, Seeger, & Huang, 2002); seizures (Panjwani et al., 1996), Type II diabetes (Malhotra, Singh, Tandon, Madhu, Prasad, et al., 2002; Sahay & Sahay, 2002); hypertension (Herrmann, 2002; Labarthe & Ayala, 2002; Sundar et al., 1984); chronic pain (Kabat-Zinn, 1982); rheumatoid arthritis (Haslock, Monro, Nagarathna, & Raghuram, 1994; Telles & Naveen, 1997); osteoarthritis (Garfinkel, Schumacher, Husain, & Reshetar, 1994); asthma (Goyeche, Abo, & Ikemi, 1982); carpal tunnel syndrome (Garfinkel & Schumacher, 2000); and chronic tinnitus (Kröner et al., 1995).

Dostalek (1994) presents a compelling case that a hatha yoga practice may also serve in the prevention of disease. He presents a discussion of the physiological mechanisms of yoga techniques leading to homeostasis of the regulatory processes. He presents experimental data suggesting that hatha yoga may lead to enhanced

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(Uma, Nagendra, Nagarathna, Vaidehi, & Seethalakshi, 1989); and complex motor tasks (Manjunath & Telles, 2001).

physiological mechanisms, such as changes in the intensity and distribution of excitation and inhibition in the brain.

#### Effects of hatha yoga on psychological states

Despite some research interest in the relationship between yoga and physiology, the empirical data investigating the association between yoga and psychological states is limited. However, the existing studies suggest a direct correlation between yoga and positive psychological states.

A study comparing the effects of 87 randomly-assigned participants to a fourteen-week yoga, swimming, or lecture (control) program assessed participants' moods using the Profile of Mood States Inventory (POMS) (Berger & Owen, 1992). The POMS is a 65-item measure of mood on a five-point scale and consists of six subscales: tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment. Participants completed the POMS at the beginning, halfway through, and towards the end of the fourteen-week session. The authors used ANOVA and a chi-square analysis to derive the findings that female yoga participants reported significantly greater decreases in fatigue than did the other group participants, and that male yoga participants reported "acute decreases" in tension, fatigue, and anger, significantly more so than did swimmers or control subjects.

These findings are similar to the findings of another study in which 195 adult participants were randomly assigned to one of four modes of exercise—aerobics, weight training, martial arts, and yoga/tai-chi. In this study, researchers found that the yoga/tai-chi group reported higher levels of tranquillity and lower levels of distress, fatigue, and exhaustion than the other groups (Szabo, Mesko, Caputo, & Gill, 1998).

Both of the above studies suggest that aerobic exercise may not be necessary to effect a positive mood change. Berger and Owen (1992) propose that the mood-enhancing benefits associated with yoga may be attributable to the “deep, rhythmical, diaphragmatic breathing” of hatha yoga, since this type of breathing is associated with stress reduction (p. 1340). Additionally, the authors suggest that other aspects of hatha yoga that might affect mood include the following: stretching and relaxing the large muscles; an internal awareness; and a focus on the present while mental chatter subsides.

In a review of the literature, Arpita (1990) compiled and summarized several studies investigating the psychological effects of hatha yoga. These studies have found yoga to be positively correlated with reduced anxiety, reduced hypertension, decreased neuroticism, lowered hostility, decreased mental fatigue, improved memory, greater openness to unusual experience, increased relaxation, improved sense of self concept, and increased self-actualization.

#### Effects of hatha yoga on SWB

Research investigating the association between yoga and SWB is scant. In an extensive search over several databases containing links to both national and international journals from psychology and other behavioral sciences, philosophy, religion, medicine, alternative medicine, and nursing, only two articles with both search terms, “yoga” and “subjective well-being,” were found. Both of these studies were conducted in India by the same authors, and both were published in Indian journals within the last three years.

Malathi, Damodaran, Shah, Patil, and Maratha (2000) investigated the effect of hatha yoga on 48 adult participants’ SWB levels. The participants were healthy staff members of a medical college/general hospital. Yoga sessions lasted one hour, five days

a week, for four months. SWB was assessed before and after the four-month period using the Subjective Well Being Inventory (SUBI),<sup>11</sup> standardized for an Indian population. The 40-item questionnaire measures feelings and attitudes in eleven dimensions of life—six positive and five negative—on a three-point response scale. At the end of four months, significant improvement was found in four of the six positive factors: general well-being; expectation-achievement congruence; confidence in coping; and transcendence. There was no statistical significance for either family group support or social support ( $p > 0.05$ ). There was also a significant decrease in scores for all five of the negative factors: primary group concern; inadequate mental mastery; perceived ill health; deficiency in social contacts; and general well-being—negative affect. The authors conclude that a regular yoga practice improves subjective feelings of well-being, except in the area of “getting help from family members, relatives and friends in problem situation or when one is seriously ill” (p. 206).

Another study was conducted by researchers (five of whom also authored the study described above) to investigate the effects of a three-month yoga program on twenty hypertensive patients (Damodaran et al., 2002). Participants were asked to undergo a battery of tests and measures before and after the three-month yoga program. These measures included the following: physiological (such as blood pressure, lipid profile, and respiratory rate); psychomotor (such as reaction time and dexterity); and psychological (self-actualization and SWB). The measure of SWB used in this study was

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<sup>11</sup> From a literature search using the keyword phrase, “Subjective Well-Being Inventory” in seventeen different databases, the search yielded three articles. In one of the articles, the SUBI was used to measure SWB of tobacco-dependent individuals in a rural part of Japan; another study used the SUBI to measure working women’s SWB in urban India; and the third article is the one under discussion. I am not familiar

the Subjective Well-Being Inventory (SUBI), the same one used in the study described above. The SUBI results are described by the authors in a single sentence, “The mean positive scores increased while mean negative scores diminished to a more positive attitude” (p. 638). A pre-post reduction in the negative factors and an increase in the positive factors are also presented in two bar charts. No other information is provided about the how the SUBI results were analyzed, or whether the results were significant. Neither is there a description of the origins of the SUBI, or whether it is a reliable and valid measure of SWB.

The two studies described above provide the only empirical data on the association between yoga and SWB. However, the SUBI seems to be a relatively obscure self-report measure of SWB and has not been used by established SWB researchers. Neither specific articles nor the journals in which both studies were published<sup>12</sup> appear to have been cited and both studies explored only short-term effects of yoga on SWB. It is also difficult to fully assess the significance of one of the two studies because the authors do not discuss how the results were obtained or whether the results were statistically significant. Additionally, neither study controlled for confounding variables of SWB.

### Research hypothesis

Numerous books and articles in the popular literature proclaim yoga as the gateway to happiness, but the empirical data to substantiate these claims is very limited and somewhat questionable. In the current project, the relationship between SWB and hatha yoga experience will be investigated by comparing the SWB of advanced yoga

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with the SUBI scale and, based on what I have read, none of the well-known SWB researchers use this scale.

<sup>12</sup> The articles were from the following journals: *Indian Journal of Physiology and Pharmacology*, *Journal of Epidemiology*, and *International Journal of Social Psychiatry*.

practitioners to that of beginners using a between-subjects design. In addition, several correlates of SWB will be controlled to lessen potential confounding effects. In order to investigate the premise that hatha yoga experience predicts SWB above and beyond that predicted by other variables, the following hypothesis is proposed:

Advanced yoga practitioners will score higher on SWB than beginning yoga practitioners when controlling for other predictors—extraversion, neuroticism, gender, age, education, income, and marital status—of SWB.

## **CHAPTER 2**

### **METHOD**

#### Overview

In this chapter, I will explain how the data for this study were collected and how the variables were operationalized. Briefly, the proposed research sought to compare the SWB levels of two groups—beginning and advanced hatha yoga practitioners—while controlling for the potential confounding variables of extraversion, neuroticism, and five demographic variables.

#### Participants

One-hundred and seventy adults filled out questionnaires for the study. Participants were recruited from hatha yoga centers in Hawai‘i and from undergraduate yoga classes the University of Hawai‘i at Mānoa Kinesiology Department (KLS 170 and KLS 171). All participants practiced yoga consistently, at least twice a week, for a minimum of one hour per practice session. The advanced yoga practitioners (Advanced Group) had been practicing yoga continuously for at least twenty-four months (two years) while the beginning yoga practitioners (Beginner Group) had been practicing yoga continuously for a minimum of one month and a maximum of twelve months (one year). Intermittent yoga practitioners were not included as participants in the study.

#### *Exclusion Criteria*

Data from 107 participants (28 male and 79 female), 62.9% of the data, were used in the final analysis. Sixty-three questionnaires, 37.1% percent of the data, were excluded based on the following: missing data, such as age, income, and ethnicity (23 people did not fully complete the questionnaire); data from participants who had been practicing

more than one year but less than two years (six participants); participants under the age of 23 (31 participants); ethnic groups which had fewer than five participants in each category (3 participants).

#### *Comparability of Groups*

The resulting data from 107 participants included 49 beginning and 58 advanced hatha yoga practitioners. The Beginner Group and Advanced Group differed on age [ $t(df = 105) = 3.360, p = .001$ ] and income [ $t(df = 105) = 2.210, p = .029$ ]. See Table 1 below for means and standard deviations of the two groups.

Table 1: Mean Scores for Age and Income by Group

	Age		Income	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Beginner	38.47	12.43	2.59	1.10
Advanced	46.33	11.70	3.05	1.05

The division of participants into several categories under “Ethnicity” also did not turn out to be equitably distributed. Participants from ethnic groups which had fewer than five participants in each group were dropped. The remaining two categories were Asians and Caucasians. There was quite a balanced number of Caucasian and Asian participants in the Beginner Group, but disproportionately more Caucasians than Asians in the Advanced Group, ( $\chi^2 = 10.80, p < .05$ ). Consequently, ethnicity was found to be significantly related to level of yoga experience, and thus the groups were not comparable in ethnicity.



Table 2: Division of Groups by Ethnicity

	Asian	Caucasian	Total
Beginner	25 (23.36%)	24 (22.43%)	49 (45.79%)
Advanced	12 (11.21%)	46 (42.99%)	58 (54.21%)
Total	37 (34.58%)	70 (65.42%)	107 (100.00%)

Because the distribution of participants into each of the “Marital Status” categories (Married, Cohabiting, Widowed, Divorced, Separated, Never Married) was skewed, this demographic was redefined by collapsing the original six categories into two categories: having a significant other and not having a significant other. Based on this redefinition, the Beginner and Advanced Groups were found to be comparable in terms of “Significant Other” ( $\chi^2 = 1.27, p > .05$ )—that is, no statistically significant association between Significant Other and yoga experience was found. See Table 3 on the following page for the distribution of participants into Beginner and Advanced Groups by Significant Other.

Table 3: Division of Groups by Significant Other

	No	Yes	Total
Beginner	29 (27.10%)	20 (18.69%)	49 (45.79%)
Advanced	28 (26.17%)	30 (28.04%)	58 (54.21%)
Total	57 (53.27%)	50 (46.73%)	107 (100.00%)

The groups were also comparable in terms of gender ( $\chi^2 = 1.55, p > .05$ ) and education ( $\chi^2 = .47, p > .05$ ): no statistically significant association was found between either gender and yoga experience, or education and yoga experience. See Tables 4 and 5 below for the distribution of participants into Beginner and Advanced Groups by gender and education.

Table 4: Division of Groups by Gender

	Male	Female	Total
Beginner	10 (9.35%)	39 (36.45%)	49 (45.79%)
Advanced	18 (16.82%)	40 (37.38%)	58 (54.21%)
Total	28 (26.17%)	79 (73.83%)	107 (100.00%)

Table 5: Division of Groups by Education

	High School	College	Masters	Higher Degree	Total
Beginner	6 (5.61%)	25 (23.36%)	11 (10.28%)	7 (6.54%)	49 (45.79%)
Advanced	7 (6.54%)	30 (28.04%)	15 (14.02%)	6 (5.61%)	58 (54.21%)
Total	13 (12.15%)	55 (51.40%)	26 (24.30%)	13 (12.15%)	107 (100.00%)

To ensure the comparability of Advanced and Beginner groups in terms of extraversion and neuroticism, a *t*-test was performed on each of the two variables. Neither test was found to be statistically significant: extraversion [ $t(df = 105) = .11$ ,  $p = .92$ ]; neuroticism [ $t(df = 105) = .80$ ,  $p = .43$ ]. This means that the two populations represented by the Advanced and Beginner Groups might be considered homogeneous in terms of extraversion and neuroticism.

In summary, the groups significantly differed in terms of education, significant other, extraversion and neuroticism, but not in age, income, and ethnicity.

### Measures

Participants completed a self-report questionnaire consisting of two scales measuring the three components of SWB (Satisfaction with Life Scale and Positive and Negative Affect Scale), one scale measuring existential well-being (Existential Well-Being Subscale), one scale measuring SWB's two major confounding variables—

extraversion and neuroticism (Revised Eysenck Personality Questionnaire), and a demographics form. (See Appendices B, C, D, E, and F.)

### *SWB Measures*

Satisfaction with Life Scale. The Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985) is a five-item survey measure with seven response options ranging from *Strongly Agree* to *Strongly Disagree*. See Appendix A: Satisfaction With Life Scale. The SWLS is designed to assess global life satisfaction, from the respondent's point of view. This cognitive judgment is based on each respondent's internal standards of life satisfaction, rather than on any externally imposed standard, and the respondents are free to weight various domains and feeling states however they choose.

The SWLS was selected for this project because it is widely recognized among SWB researchers as a reputable measure of overall life satisfaction, and also for its simplicity—five items on a seven-point scale.

In a series of three validation studies with undergraduate and elderly participants (Diener et al., 1985), test-retest reliability after a two-month interval was favorable: the correlation coefficient was 0.82 and the coefficient alpha was 0.87. SWLS does not seem to evoke a social desirability response set as evidenced by the low correlation, 0.02, between SWLS scores and the Marlowe-Crowne scale of social desirability. The SWLS and nine other measures of subjective well-being had moderately strong positive correlations, from .50 to .75. There was a favorably high level of internal consistency for the scale, with item-total correlations for the five SWLS items measuring: .81, .63, .610, .75, and .66.

In the present study, reliability for the SWLS was high: the Cronbach coefficient alpha was .86 based on a sample of 107 participants.

Positive and Negative Affect Scale. The Positive and Negative Affect Scale (PANAS) (Watson, Clark, & Tellegen, 1988) is a twenty-item measure of pleasant and unpleasant affect. See Appendix C: Positive and Negative Affect Scale. Each item comprises a single adjective (e.g., “interested,” “excited,” “scared,” and “distressed”), and respondents select one of five response options ranging from *Very Slightly or Not At All* to *Extremely* to describe how they generally feel. Since positive and negative affect reflect relatively independent dimensions, PANAS has ten items which measure positive affect and another ten items which measure negative affect.

Positive Affect reflects the extent to which a person feels enthusiastic, active, and alert...low [Positive Affect] is characterized by sadness and lethargy. In contrast, Negative Affect 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 [Negative Affect] being a state of calmness and serenity. (p. 1063, Watson et al., 1988)

Data from administering the PANAS to undergraduate participants reflect high internal consistency: the coefficient alpha for Positive Affect (PA) was .88; and .87 for Negative Affect (NA). The correlation between PA and NA was -.17, indicating that positive and negative affect are separate dimensions. Test-retest reliability after an eight-week interval measured .68 for PA and .71 for NA.

Reliability for the PANAS was high: in the present study, the Cronbach coefficient alpha for PA was 0.87 and 0.88 for NA based on a sample of 107 participants.

The PANAS was selected as a survey measure in this dissertation project because of its widespread use as a measure of positive and negative affect, presumably due to its reliability as a measure of these independent constructs.

The validity studies for each of the SWLS and the PANAS described above were reported by various authors and used in different contexts (i.e., the scales were used separately or in combination with other scales). In the present study, since the two scales are being used together to measure SWB, an issue might be that when the items from the SWLS and the PANAS are used together, do they still represent the three distinct dimensions of life satisfaction, positive affect (PA), and negative affect (NA)? To clarify this, a Principal Components Analysis was performed on the three dependent variables SWLS, PA, and NA to determine whether each variable was indeed measuring three independent constructs. The factor procedure used was an obliquely rotated (PROMAX) factor structure. Factor loadings were quite high. See Table 6 (following page) for item correlations; each dot represents a correlation less than .35.

Table 6: PROMAX Factor Pattern for SWLS, PA, and NA

Questionnaire Items	NA (Factor 1)	PA (Factor 2)	SWLS (Factor 3)
SWLS 1	.	.	<b>.863</b>
SWLS 2	.	.431	<b>.885</b>
SWLS 3	.	.471	<b>.845</b>
SWLS 4	.	.383	<b>.783</b>
SWLS 5	.	.	<b>.700</b>
PANAS 1	.	<b>.665</b>	.
PANAS 3	.	<b>.562</b>	.
PANAS 5	.	<b>.688</b>	.406
PANAS 9	.	<b>.750</b>	.359
PANAS 10	.	<b>.560</b>	.
PANAS 12	.	<b>.642</b>	.
PANAS 14	.	<b>.793</b>	.401
PANAS 16	.	<b>.747</b>	.374
PANAS 17	.	<b>.777</b>	.
PANAS 19	.	<b>.655</b>	.
PANAS 2	<b>.731</b>	.	.
PANAS 4	<b>.705</b>	.	.
PANAS 6	<b>.612</b>	.	.
PANAS 7	<b>.713</b>	.	.
PANAS 8	<b>.699</b>	.	.
PANAS 11	<b>.684</b>	.	-.373
PANAS 13	<b>.711</b>	.	.
PANAS 15	<b>.798</b>	.	.
PANAS 18	<b>.731</b>	.	.
PANAS 20	<b>.768</b>	.	.

The proportion of variance accounted for by SWLS, PA, and NA was 55.58%. See Table 7 below for inter-factor correlations.

Table 7: Inter-Factor Correlations For SWLS, PA, and NA

	PA (Factor 2)	SWLS (Factor 3)
NA(Factor 1)	-.18	-.19
PA (Factor 2)		.40

Existential Well-Being Subscale. The Spiritual Well-Being Scale is a twenty-item measure, made up of two subscales: the Religious Well-Being subscale (RWBS), measuring respondents' sense of well-being in relation to God; and the Existential Well-Being subscale (EWBS), measuring people's sense of satisfaction with themselves (Ellison, 1983). Only the EWBS will be included in the questionnaire as I wanted to omit the dimension of religiosity in my dissertation project. Because the RWBS uses the term "God" in all its items, and the tone of the religious items are biased towards Western/Christian religions (e.g., in the use of the terms "prayer" and "communion"), I thought that this might prompt atheists or respondents of other religious faiths to skip those items.

In contrast, the EWBS measures spirituality from a social-psychological perspective; it refers to purpose in life and satisfaction with life. There is no reference to religious concepts. The concept *existential well-being* is concerned with people's experiences of who they are, where they belong, whether they have a sense of purpose in life, and why. The EWBS examines the spiritual components of well-being, transcendence, and ultimate concerns.



The EWBS is a ten-item subscale with half of the items worded negatively and the other half worded positively to control for response bias. There are six response options, ranging from *Strongly Agree* to *Strongly Disagree*. See Appendix D: Existential Well-Being Subscale.

Reliability for the EWBS has been tested with undergraduate participants. The test-retest reliability coefficient measured 0.86. Internal consistency was moderately high, with a coefficient alpha of 0.78. In addition, evidence for the EWBS as a measure of well-being has been strongly supported. It has been found to correlate positively with many indicators of well-being, such as positive self-concept, finding meaning and purpose in life, good physical health and good emotional adjustment (MacDonald, LeClair, Holland, Alter, & Friedman, 1995). Furthermore, MacDonald, Kuentzel and Friedman (1999) conducted a database search for instruments that measured spiritual and transpersonal constructs, and after selecting and reviewing ten instruments that they believed to be the most psychometrically sound, they found that the SWBS (which includes the EWBS) was one of the most commonly used instruments in the research reviewed.

In the present study, reliability for the EWBS was high: the Cronbach coefficient alpha was 0.83 based on a sample of 107 participants.

I included the EWBS in this study in an attempt to capture transpersonal concerns, or other components of experience which might contribute to happiness, such as “meaning, ideals, faith, commitment, purpose in life” (Ellison, 1983, p. 336). These components are not captured by the definition of SWB, nor are they accounted for by the SWLS (which measures global life satisfaction) or the PANAS (which measures negative

and positive affect). I included the EWBS based on the possibility that if there is a qualitative difference in happiness between beginning and advanced yoga practitioners, it might be accounted for by the EWBS.

*Measures to control for potential confounding variables*

Examining the relationship between yoga and SWB is complicated by the findings of several studies that SWB has consistently been found to be directly correlated with extraversion (E) and inversely correlated with neuroticism (N). In order to get an accurate measure of the correlation between yoga and SWB, it is necessary to ensure that the two groups—Beginning and Advanced—are similar on the traits of E and N, that is, to partial out the effects of E and N on SWB.

Eysenck Personality Questionnaire—Revised—Short Form (EPQ-R). The EPQ-R (Eysenck & Eysenck, 1994) is a 57-item yes-no inventory measuring three major personality dimensions—extraversion (E), neuroticism (N), and psychoticism (P)—and also includes a lie scale (L). It is the latest in a succession of the Eysencks' personality scales. The original scale, the Maudsley Medical Questionnaire (1952), measured only N. This was replaced by the Maudsley Personality Inventory (1962) which measured E and N. Then followed the Eysenck Personality Inventory (EPI, 1964) which measured E and N, and the newly-added L. P was introduced in the EPQ (1975) which measures E, N, L, and P.

In the current project, only the E- and N-subcales of the EPQ-R (twelve items per subscale, for a total of 24 items) were used. High N scores suggest a tendency towards irritability, nervousness, mood swings, feelings of guilt, dissatisfaction, feeling unfit, worrying, feeling easily hurt, and having trouble falling asleep. High E scorers are

characterized by playfulness, excitement-seeking, impulsivity, liveliness, gregariousness; and inclinations toward being carefree, talkative, and fast moving (Tellegen, 1978)<sup>13</sup>.

The EPQ is well-known and repeatedly used in research investigating personality. In a meta-analysis of several studies examining a total of 137 personality traits, DeNeve and Cooper (1998) found that the EPQ was the most frequently used personality measure. In their review, 26 studies had used the EPQ, compared with only eight studies that had used the NEO Personality Inventory (Costa & McCrae, 1992) and seven studies that had used the 16 PF (Sixteen Personality Factor Questionnaire; Cattell, Eber, & Tatsuoka, 1970). Tellegen (1978), in reference to the earlier EPI, suggests that it “remains the best known self-report instrument measuring the two major personality dimensions [E and N]” (p. 553).

The psychometric properties are strongly established for the EPI, but are less so for the EPQ, primarily because of the newly-added P factor which has poor reliability and validity, and secondarily, because the Eysencks refer potential users of the EPQ to validity studies of their previous versions (e.g., the EPI), presuming that the older inventories and the newer ones are comparable enough to justify this extrapolation (Block, 1978). I was inclined to use the EPI’s E- and N-scales, except that the wording of several items are out-of-date. For example, one of the E items in the EPI is phrased, “Can you usually let yourself go and enjoy yourself a lot at a gay party?” Auke Tellegen, who reviewed both the EPI and the EPQ in the *Eighth Mental Measurements Yearbook* (1978), advised that the EPI’s outdated wording—the potential for the items to be

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<sup>13</sup> The work cited refers to a description of the earlier EPI. However, from the EPI to the EPQ-R, little has changed in terms of the E- and N-scales.

misinterpreted—is sufficient reason to use the current EPQ instead of the older EPI (personal communication, August 26, 2003).

Test-retest correlations for the EPQ using a sample of 257 subjects were: 0.89 for E and 0.86 for N (Kline, 1978). Over a one-month interval, test-retest reliability ranged from 0.80 to 0.90 (Stricker, 1978). The internal consistencies estimated by alpha coefficients ranged from 0.79 to 0.85 (Stricker, 1978) and from 0.68 to 0.88 with median 0.84 (Kline, 1978). Intercorrelations for each of the separate scales (E, N, P, and L) were found to be lower than  $-0.24$  (Stricker, 1978).

In the present study, the Cronbach coefficient alpha was 0.82 for the E-scale and 0.84 for the N-scale based on a sample of 107 participants.

A Principal Components Analysis with PROMAX rotation was used to check whether two dimensions could summarize the 24 items. See Table 8 on the following page for factor loadings. Each dot represents a correlation less than .35.

Table 8: PROMAX Factor Pattern for Neuroticism and Extraversion

Questionnaire Items	Neuroticism (Factor 1)	Extraversion (Factor 2)
EPQR 2	.	<b>.706</b>
EPQR 3	.	<b>.530</b>
EPQR 4	-.350	<b>.573</b>
EPQR 6	.	<b>.595</b>
EPQR 10	.	<b>.567</b>
EPQR 13	.	<b>.510</b>
EPQR 15	.	<b>.656</b>
EPQR 16	.	<b>.624</b>
EPQR 17	.	<b>.598</b>
EPQR18	.	<b>.683</b>
EPQR 23	.	<b>.300</b>
EPQR 24	.	<b>.652</b>
EPQR 1	<b>.577</b>	.
EPQR 5	<b>.674</b>	.
EPQR 7	<b>.522</b>	.
EPQR 8	<b>.504</b>	.
EPQR 9	<b>.640</b>	.
EPQR 11	<b>.692</b>	.
EPQR 12	<b>.731</b>	.
EPQR 14	<b>.632</b>	.
EPQR 19	<b>.428</b>	.
EPQR 20	<b>.605</b>	.
EPQR 21	<b>.557</b>	.
EPQR 22	<b>.688</b>	.

The proportion of variance accounted for by extraversion and neuroticism was 37.73%

See Table 9 below for the inter-factor correlation.

Table 9: Inter-Factor Correlation for Neuroticism and Extraversion

	Extraversion (Factor 2)
Neuroticism (Factor 1)	-.10

### Procedure

After permission was attained to visit several beginning and advanced hatha yoga classes, an announcement was made that I was doing a project on yoga and well-being, and I asked the yoga practitioners to please support the yoga research by filling out a questionnaire. The IRB (Institutional Review Board) waived the signed consent requirement since it would be the only identifier of each participant<sup>14</sup>. Instead, the announcement to potential participants served as part of the consent process, during which the research was described orally. See Appendix G for announcement script to potential participants. In addition, a consent sheet handout was provided to participants to keep. See Appendix H for consent form. Questionnaires and pencils were distributed outside of the yoga studios so that yoga students who participated in the research would not delay the start of the next yoga class. Respondents remained anonymous and they put their finished questionnaires into a covered box.

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<sup>14</sup> IRB exempt approval for this research project was granted on August 28, 2003: CHS (Committee on Human Studies) # 12544 of the University of Hawai'i at Mānoa.

### CHAPTER 3 RESULTS

#### Overview

Multivariate analysis of covariance (MANCOVA) was used to determine the effect of yoga experience on the three dependent measures (SWLS, PA, and NA) considered together. Subsequent univariate analysis of covariance (ANCOVA) was performed on each of the three dependent measures. An alpha level of .05 was used for all statistical tests.

As hypothesized, the Advanced Group (advanced hatha yoga practitioners) was found to have higher levels of SWB (subjective well-being) than the Beginner Group (beginning hatha yoga practitioners): scoring higher on both SWLS and PA; and lower on NA. See Table 10 for mean scores by group.

Table 10: Mean Scores of SWB Measures for Beginner and Advanced Groups

	SWLS		PA		NA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Beginner <i>n</i> = 49	26.469	5.276	3.527	.591	1.952	.621
Advanced <i>n</i> = 58	28.466	4.710	3.859	.505	1.720	.512

#### MANCOVA Analysis

Multivariate analysis of covariance (MANCOVA) was used to determine the effect of six covariates (extraversion, neuroticism, age, income, ethnicity, and significant other) and one independent variable of interest (level of yoga experience) on the three measures of SWB—SWLS, PA, and NA—considered together, with a particular focus on the effect of yoga experience after controlling for all the other predictors. Three of the

covariates were found to be significantly related to SWB. The effect of the independent variable of interest—yoga experience—on SWB was found to be marginally significant. See Table 11 for  $F$  ratios.

Table 11: Multivariate Analysis of Covariance (MANCOVA) for Variables Found to Have a Significant Effect on SWB

Variable	$df$	$F$	$\Lambda$	$p$
Extraversion	3	6.89	.82	.01
Neuroticism	3	17.54	.65	.01
Significant Other	3	2.87	.92	.04
<b>Yoga Experience</b>	<b>3</b>	<b>2.66</b>	<b>.92</b>	<b>.0526</b>

#### ANCOVA Analysis

Subsequent univariate analysis of covariance (ANCOVA) revealed that of the three dependent variables, SWLS, PA, and NA, yoga experience was found to have a significant effect on PA, with overall ANCOVA as follows:  $F(7, 106) = 7.390, p < .0001, R^2 = .343$ . Even after controlling for the six covariates, yoga experience was found to be significant [ $F(1, 106) = 6.47, p = .0125, R^2 = .0429$ ]. This means that on average the Advanced Group scored .265 points higher than the Beginning Group on PA as measured by the PANAS, and that 4.29% of the variance in PA can be attributed to yoga experience.

Although the level of yoga experience on both SWLS and NA was not found to be significant, the difference was in the anticipated direction, with the Advanced Group



scoring higher on SWLS, and lower on NA, than the Beginner Group. The overall ANCOVA for SWLS on yoga experience was significant [ $F(7, 106) = 3.39, p = .003, R^2 = .193$ ] but yoga experience was not found to be significant after controlling for the six covariates [ $F(1, 106) = 1.24, p = .268, R^2 = .010$ ]. Similarly, overall ANCOVA for NA was significant [ $F(7, 106) = 10.55, p < .0001, R^2 = .427$ ], but yoga experience was not found to be statistically significant after controlling for the six covariates [ $F(1, 106) = 2.29, p = .133, R^2 = .013$ ]. See Table 12 for ANCOVA results.

Table 12: Analysis of Covariance (ANCOVA) for PA, NA, and SWLS

Dependent Measures	<i>df</i>	<i>F</i>	<i>R</i> <sup>2</sup>	$\beta$	<i>p</i>
PA <sup>1</sup>	7	7.39	.343	.27	.01
PA <sup>2</sup>	1	6.47	.429		.01
NA <sup>1</sup>	7	10.55	.427	-.15	.01
NA <sup>2</sup>	1	2.29	.010		.13
SWLS <sup>1</sup>	7	3.39	.193	1.15	.01
SWLS <sup>2</sup>	1	1.24	.010		.27

<sup>1</sup> Overall ANCOVA

<sup>2</sup> ANCOVA with six covariates partialled out

The Existential Well-Being Subscale (EWBS) was included in the study in an attempt to find out whether existential well-being might be experienced at higher levels by advanced yoga practitioners than by beginners. The finding was not significant [ $F(1, 106) = 3.0, p = .09, R^2 = .022$ ].

## CHAPTER 4 DISCUSSION

### Overview

SWB is a multi-dimensional concept comprising three components—cognitive judgment of satisfaction with life, positive affect, and negative affect—measured in this study by the Satisfaction With Life Scale (SWLS) and the positive affect (PA) subscale and negative affect (NA) subscale of the Positive and Negative Affect Scale (PANAS). The primary aim of this study was to examine the relationship between yoga experience and the above three measures of SWB while controlling for the two variables of extraversion and neuroticism that have been shown in the SWB literature to be strongly correlated with SWB; and, in addition, controlling for the demographic variables of age, gender, significant other, ethnicity, and income.

This study's primary outcome was that the SWB scores for advanced yoga practitioners were found to be higher than the scores for beginning yoga practitioners after controlling for the covariates. That is, compared with the beginners, experienced yogis' scores on the three measures of SWB reflected greater life satisfaction, more pleasant emotions, and fewer unpleasant emotions.

What can this difference be attributed to? Perhaps maintaining a steady yoga practice over time increases SWB levels. But perhaps it is the opposite case: individuals who have high SWB are motivated to maintain a continuous yoga practice. Or perhaps it is simply that SWB and yoga are positively correlated without directly influencing each other. Since this study did not seek to investigate a causal relationship between SWB and yoga, the issue cannot be addressed at this time. The questions that are answered by the

results of this study are whether SWB and yoga experience are positively related—the answer is yes—and the extent to which this is so.

### Yoga Experience Criteria

One interpretive concern that might affect the validity of the statistical results reported is how yoga experience was assessed. Level of yoga experience was determined by considering a combination of two factors: intensity and continuity of participants' yoga practice.

#### *Intensity*

“Intensity” included the duration and frequency of each participant's yoga practice both in formal yoga classes, as well as in informal, non-class settings (such as at home, by oneself). “Duration” was the aggregate of average time, in minutes, a participant practiced yoga in a yoga class (duration of yoga class or “DYCL”) and the average time, in minutes, spent practicing yoga outside of class (duration of non-class yoga practice or “DYNCL”). (Refer to Appendix F: Demographics Form, Question 12.) “Frequency” was the aggregate of the number of yoga classes attended per week (class per week or “CLPW”) and the number of non-class yoga practice sessions per week (non-class yoga sessions per week or “NCLPW”). (Refer to Demographics Form, Questions 10 and 11.) Thus, intensity was the sum of the duration and frequency of each participant's yoga practice both in class, and in non-class settings  $[(DYCL \times CLPW) + (DYNCL \times NCLPW)]$ .

#### *Continuity*

“Continuity” was calculated by considering the total number of months the participants had ever practiced yoga (months of total practice or MTP), as well as the

total number of months they had most recently been practicing yoga on a continuous basis (months of continuous practice or MCP). (Refer to Demographics Form, Questions 8 and 9.) This second component of continuity—MCP—was included in the assessment criteria to account for those participants who had taken up a yoga practice some years ago, then stopped, then started practicing again. For example, if a participant had started a yoga practice twenty years ago, but stopped after six months, then started doing yoga again eight months ago, her MTP and MCP scores would be very different from another participant who started twenty years ago but maintained a continuous practice over the years. See Table 13 below for a representation of how participants' yoga experience was assessed.

Table 13: Criteria for Division of Participants into Advanced or Beginner Groups

<b>Intensity</b>		<b>Continuity</b>
Class Practice (Duration X Frequency) (DYCL x CLPW)	Home Practice (Duration X Frequency) (DYNCL x NCLPW)	MTP, MCP

*Derivation of Criterion to be used as the Determinant of Yoga Experience Level*

Advanced and beginning yoga practitioners did not differ on current “intensity” of yoga practice. Interactions between each of the covariates—age, income, ethnicity, significant other, EXT, and NEU—and yoga experience were checked and because none were significant, “intensity” was dropped as a predictor of yoga experience level. Refer to Table 14 below for *F* ratios.

Table 14: Interaction Effects Between Level of Yoga Experience and Covariates

Covariate	<i>F</i> -Ratios
Age	$F(3, 91) = 2.04, p = .11$
Income	$F(3, 91) = .63, p = .60$
Ethnicity	$F(3, 91) = .96, p = .42$
Significant Other	$F(3, 91) = .40, p = .40$
EXT	$F(3, 91) = 1.59, p = .20$
NEU	$F(3, 91) = .08, p = .97$

A model including the six covariates, intensity, MCP, and intensity x MCP was considered. However, no effects involving intensity were found to be statistically significant.

“Continuity” was found to be a significant variable, as were each of the components of continuity, MTP and MCP. However, MTP and MCP were so highly correlated ( $r = .89$ ) that it was not necessary to run a separate analysis for each: they were essentially the same analysis. For parsimony’s sake, MCP and MTP were then regarded as the same variable and the analysis was run based on MCP. This variable, MCP, became the determinant of yoga experience level. There were no interaction effects, which justifies the main effect model.

#### Interpretive Qualifications

Thirty-eight percent of the collected data were not used for various reasons. (Refer to the Participants section in Chapter 2.) The actual sample set used in the final data analysis was relatively small and perhaps somewhat inadequate for the purpose of

controlling for seven covariates. There were several strict exclusion criteria in the selection of participants in order to attain comparability between the Advanced and Beginner Groups. For example, data for participants below 23 years old were excluded because there was a disproportionate number of beginning yoga practitioners who belonged to this age category but none in this age category who were advanced practitioners. Efforts were made to search for more advanced practitioners (such as specifically seeking out advanced yoga classes for data collection), although ultimately, no Advanced Group participants under the age of 23 were found. Participants in the Advanced Group on average were eight years older than participants in the Beginner Group. This age differential is not quite unexpected given that the requirement for an advanced practitioner was a yoga practice of at least twice a week for a minimum of two years. It is probable that many young people practice yoga, but not many start young enough to meet the Advanced Group requirement of two years practice. In addition, yoga has only become popular with younger people recently, and it is conceivable that if this same study were to be conducted a few years in the near future, there would be more young participants who would meet the requirements of the Advanced Group.

Similarly, Advanced Group participants were more affluent than Beginners. Again, this is not very surprising, given the advanced participant was an average of eight years older than the beginner. Older people tend to be wealthier since they have had more time and opportunity to earn their living.

Despite these problems, a significant main effect, though small, was found, and even though caution should be used in interpreting the results, the results should not be dismissed entirely. Although the analysis was performed on a small sample set, the data

were conscientiously checked for details such as interaction effects. Had the sample size been larger, the groups might have been more comparable in terms of age, income, and ethnicity; and correspondingly, the results might have emerged stronger than they did.

If this study is replicated, a larger sample should be attempted. Perhaps data could be collected from large urban centers such as New York City or San Francisco where yoga is extremely popular and the students who attend classes represent more diversity than do the yoga practitioners of Hawai‘i.

The non-significant, non-anticipated findings for two of the SWB measures—SWLS and NA—and for EWBS must be noted. The possibility that the null hypothesis is true should not be disregarded: perhaps it is the case that yoga experience is not correlated with NA, SWLS, or EWBS.

However, it is worthwhile noting that although yoga experience (with other covariables partialled out) was only found to have a significant effect on PA, the effect of yoga experience on each of NA, SWLS, and EWBS was in the anticipated direction. In other words, the results for SWLS, NA, and EWBS were found to be in accordance with the study’s hypothesis that advanced practitioners would score higher on PA, SWLS, and EWBS, and lower on NA, than would beginners, although these results were not found to be statistically significant. As suggested earlier, if the sample size were larger and the groups more comparable in terms of age, income, and ethnicity, a significant result might have been found for SWLS and NA.

#### Relationship Between SWB, Yoga Experience, Extraversion, and Neuroticism

In this study, yoga experience was not found to have as strong a relationship with SWB compared with the neuroticism-SWB and extraversion-SWB relationships. For

SWLS, after controlling for the effects of other covariates, extraversion accounted for 5.21% of the variance in SWLS ( $p < .05$ ) and neuroticism accounted for 4.69% of the variance in SWLS ( $p < .05$ ). This was greater than the proportion of variance accounted for in SWLS by yoga experience (1.01%,  $p > .05$ ).

For NA, after controlling for other covariates, neuroticism accounted for 2.67% of the variance in NA, greater than the proportion accounted for in NA by extraversion (0.61%,  $p > .05$ ) and yoga experience (1.33%,  $p > .05$ ).

However, yoga experience accounted for a greater proportion of the variance in PA (4.29%,  $p = .05$ ) than either extraversion (1.34%,  $p < .05$ ) or neuroticism (0.03%,  $p > .05$ ).

It has already been established in the SWB literature that extraversion and neuroticism have strong correlations with SWB. Several authors argue that neuroticism is the best predictor of SWB (e.g., DeNeve & Cooper, 1998; Vittersø & Nilsen, 2002) while others insist that extraversion best predicts SWB (e.g., Argyle & Martin, 1999). Hence, the present study's findings of larger effects for extraversion and neuroticism on SWLS and NA are not surprising. Interesting, though, is the finding that yoga experience was found to have a larger effect on PA than either extraversion or neuroticism.

#### Relationship Between Positive Affect (PA), Yoga Experience, and Meditation

##### Experience

Of the three dependent variables (SWLS, PA, and NA), yoga experience was found to have a significant effect on positive affect ( $p = .01$ ) after controlling for the effects of other covariates. In other words, based on the results of this study, people who practiced yoga for over two years (participants from the Advanced Group) experienced



more pleasant emotions than those who practiced yoga for less than one year (Beginner Group participants), a finding that cannot simply be attributed to age, income, or any of the other covariates discussed earlier.

This finding parallels that of several studies documented in the meditation literature. In these meditation studies, subjects reported experiencing increased positive affect from long-term meditation practice, such as the finding by Forte, Brown, and Dysart (1987-88) who compared three groups of meditators at different levels of experience and found that the most experienced meditators reported the highest level of equanimity. In a different study, 95% of the advanced meditators experienced rapture and bliss, compared with only 40% of the less experienced group (Kornfield, 1979).

Both yoga and meditation have been touted as a means to attaining calm, relaxation, and other positive emotions (e.g., Shapiro, 1980). Both the yoga and meditation literature suggest that practitioners experience more positive affect than do non-practitioners (e.g., Gifford-May & Thompson, 1994; Szabo et al., 1998), and also that long-term practitioners experience greater positive affect than do short-term practitioners (e.g., Kornfield, 1979; the current study).

What is this all about? Is there something in common that these so-called alternative practices share that directly or indirectly enhances positive emotions? Is there some inherent “feel-good” element in practicing yoga and/or meditation? If so, what is it? Perhaps it is not about the activity itself that is so potent, but the perseverance factor—is there something about persisting with an activity that brings about joy over time? Perhaps there is an element of control over one’s life that is crucial. Will that good feeling increase still more if one continues to practice the same activity over the years? Perhaps it

is not the activity itself, or persevering in that activity; perhaps it is simply the factor of doing something, rather than nothing, that produces enjoyment. This would fit in well with the finding from SWB research suggesting that participation in a leisure activity (Argyle, 2001) and becoming engaged or absorbed in it (Csikszentmihalyi, 1990, 1999) are predictors of SWB.

Future research could investigate the causal links between yoga experience and positive affect, or between yoga experience and either of the other two components of SWB. An exploration into the relationship between yoga experience and neuroticism could produce interesting results, as well. The yoga literature is full of studies supporting the physiological benefits of yoga. At any rate, the current study provides an impetus to pursue further empirical studies into the effects of yoga and similar practices upon the psychological well-being of practitioners.

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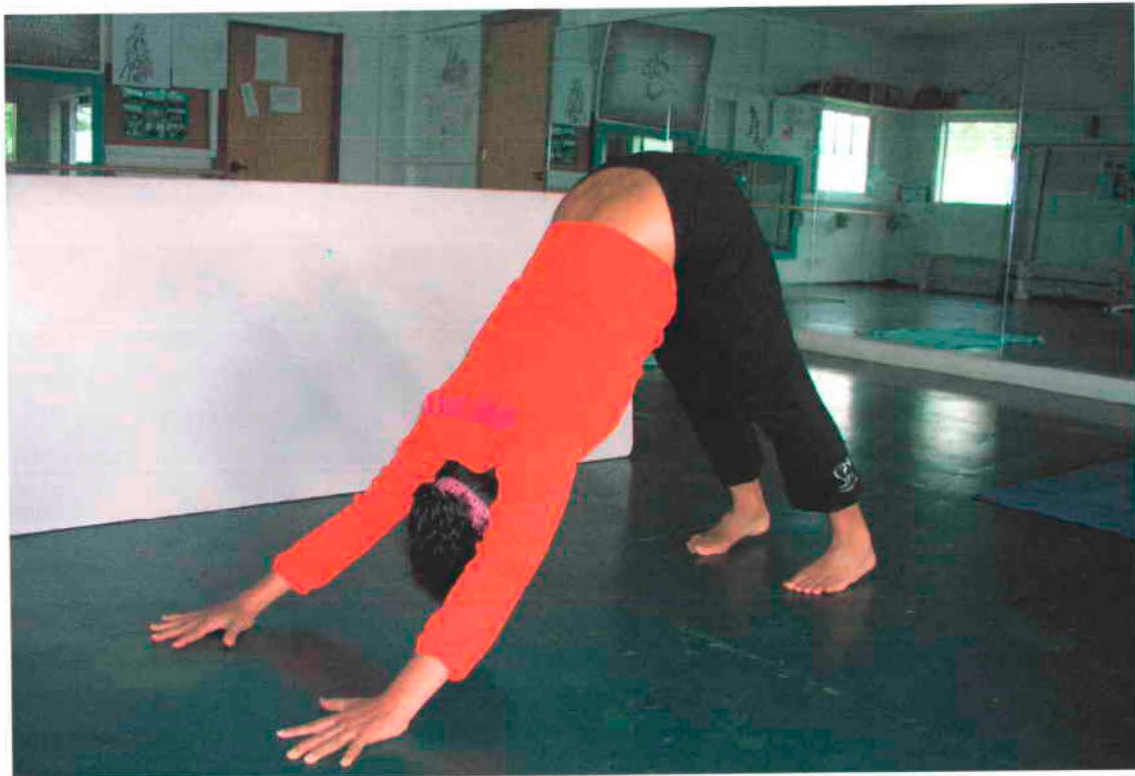
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Appendix A: Illustrations and Purported Benefits of Five Sample Asanas

*Adho Mukha Svanasana*  
Downward-Facing Dog Pose

Beneficial effects

- relieves stiffness in the heels and shoulder-blades
- strengthens the ankles, legs, abdominal muscles, wrists, arms, and shoulder
- stretches the backs of the legs and opens the hips
- elongates and releases tension throughout the entire spinal column
- reduces fatigue by bringing blood flow to the head (Farhi, 1994a; Iyengar, 1979).

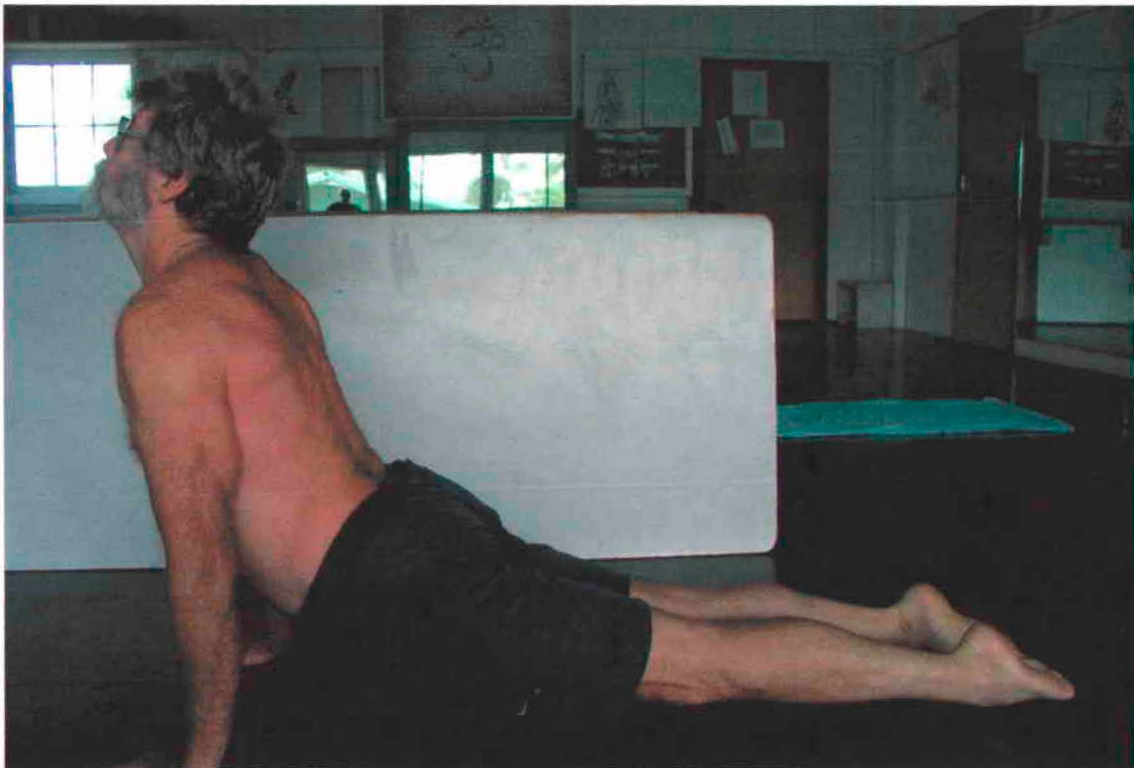




## *Urdhva Mukha Svanasana* Upward-Facing Dog Pose

### Beneficial effects

- stimulates kidney and adrenal function
- expands the chest and opens the heart center
- expands the rib cage and increases lung capacity
- energizes the spine, prevents hunched upper back, relieves backache
- strengthens arms and legs
- increases blood flow in abdomen and pelvis (Palkhivala, 2003).



## *Marichyasana III* Pose Dedicated to the Sage Marichi

### Beneficial effects

- stimulates the circulation, tone, and function of the internal organs, especially the liver, lungs, and spleen
- stimulates and tones the intrinsic muscles of the spinal column, relieving deeply held tension in the back
- relieves tension in the upper back, neck, and shoulder muscles
- assists the elimination of toxins, waste products, and waste metabolites from both the muscles and visceral tissue (Farhi, 1994b).



*Parsva Bakasana*  
Twisted (Sideways) Crane Pose

Beneficial effects

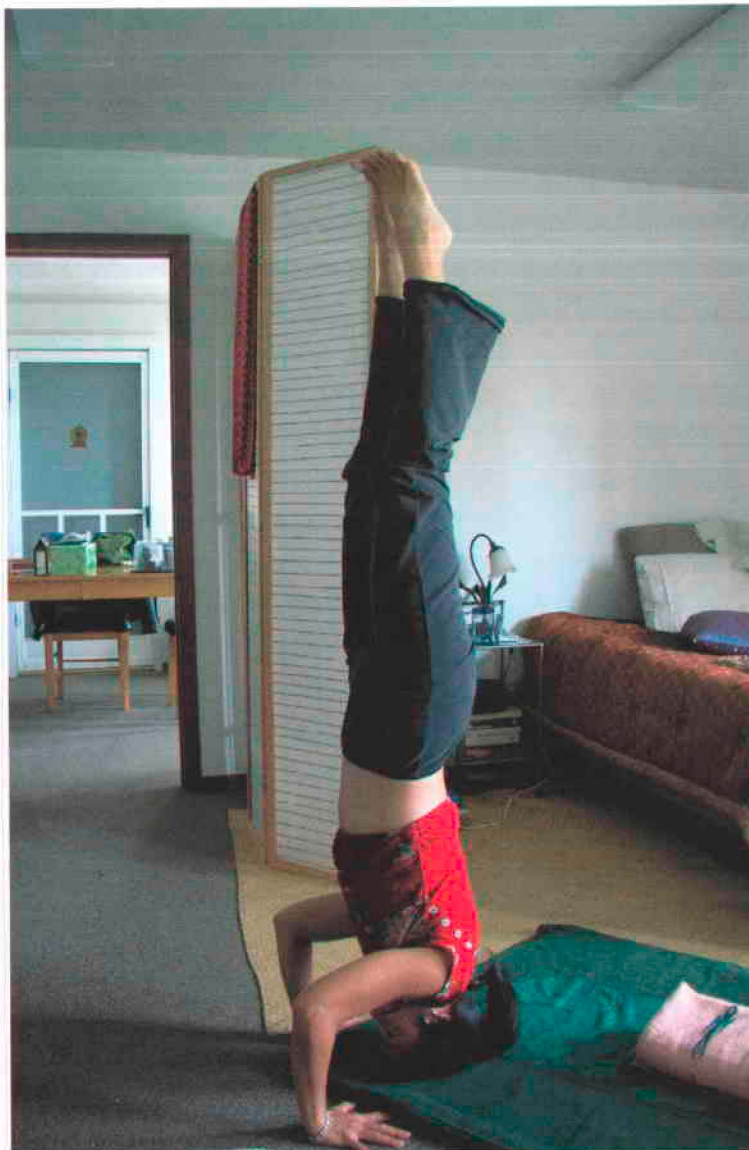
- tones and increases the circulation throughout the torso
- massages the deep internal organs, especially the abdominal organs and the kidneys
- strengthens the whole frame of the arm from the muscles of the shoulder girdle to the wrists
- increases stamina, endurance, and coordination (Farhi, 1994c, pp. 50-51).



## *Sirshasana II* Headstand II

### Beneficial effects

- stimulates the nervous system, increasing mental alertness and clarity
- nourishes the endocrine system (the glands and the hormones they produce), thus promoting a balance of all metabolic functions in the body
- increases and improves circulation and prevents build-up of fluid in the legs
- heats the body and increases the gastric fire and that of the solar plexus. Prolonged practice may contribute to weight regulation
- helps promote bowel regularity (Farhi, 1994d, pp. 54-55)



## Appendix B: Three Sample Items from the Satisfaction With Life Scale

		Strongly Agree	Agree	Slightly Agree	Neither Agree Nor Disagree	Slightly Disagree	Disagree	Strongly Disagree
1	In most ways my life is close to my ideal.	1	2	3	4	5	6	7
2	The conditions of my life are excellent.	1	2	3	4	5	6	7
3	I am satisfied with my life.	1	2	3	4	5	6	7

## Appendix C: Three Sample Items from the Positive and Negative Affect Scale

		Very Slightly Or Not At All	A Little	Moderately	Quite A Bit	Extremely
1	Interested	1	2	3	4	5
2	Distressed	1	2	3	4	5
3	Excited	1	2	3	4	5

## Appendix D: Three Sample Items from the Existential Well-Being Subscale

		Strongly Agree	Moderately Agree	Agree	Disagree	Moderately Disagree	Strongly Disagree
1	I don't know who I am, where I came from, or where I'm going.	1	2	3	4	5	6
2	I feel that life is a positive experience.	1	2	3	4	5	6
3	I feel unsettled about my future.	1	2	3	4	5	6

## Appendix E: Three Sample Items from the Eysenck Personality Scale—Revised

		Yes	No
1	Does your mood often go up and down?	1	0
2	Are you a talkative person?	1	0
3	Are you rather lively?	1	0



## Appendix F: Demographics Form

1. Sex
  - Male ..... 1
  - Female..... 2
2. Age, in years. (Please specify.) \_\_\_\_\_
3. Marital Status
  - Married..... 1
  - Living as married (Cohabiting)..... 2
  - Widowed..... 3
  - Divorced..... 4
  - Separated..... 5
  - Never married..... 6
4. Annual Personal Income
  - \$10,000 or under..... 1
  - \$10,000 - \$30,000..... 2
  - \$30,000 - \$50,000..... 3
  - \$50,000 or more..... 4
5. Education. (Please select highest degree earned.)
  - Less than high school diploma..... 0
  - High school diploma..... 1
  - College degree..... 2
  - Master's degree..... 3
  - Higher Degree (such as M.D., D.O., Ph.D., J. D.)... 4
6. Ethnicity
  - African American..... 1
  - Alaskan Native or Eskimo..... 2
  - American Indian ..... 3
  - Asian ..... 4
  - (please specify) \_\_\_\_\_
  - Hispanic ..... 5
  - (please specify) \_\_\_\_\_
  - Pacific Islander..... 6
  - (please specify) \_\_\_\_\_
  - White or Caucasian ..... 7
  - No primary affiliation/ Mixed race..... 8
  - (please specify) \_\_\_\_\_
  - Other..... 9
  - (please specify) \_\_\_\_\_

7. Are you currently practicing yoga two or more times per week? \_\_\_\_\_
8. How many months or years have you been practicing yoga *continuously*, up to the present? (If you practiced yoga at some point in your life, then stopped, then took it up again, how many months/years have you been practicing yoga this most recent time?)
- \_\_\_\_\_ months / \_\_\_\_\_ years.
9. How many *total* months or years have you ever practiced yoga?
- \_\_\_\_\_ months / \_\_\_\_\_ years.
10. On average, how many times per week do you attend a formal yoga class?\*
- \_\_\_\_\_ times per week.
11. On average, how many times per week, other than a formal yoga class, do you practice yoga?\*
- \_\_\_\_\_ times per week.
12. On average, what is the duration of your typical yoga practice session?\*
- Yoga class \_\_\_\_\_.
- Outside class \_\_\_\_\_.
13. Any additional comments?
- \_\_\_\_\_

\* If you practiced yoga at some point in your life, then stopped, then took it up again, please respond to this question for your most recent period of yoga practice.

**Please check to see that you have completed all of the items in the questionnaire.**

**Mahalo for your participation! Namaste.**

Appendix G: Announcement Script for Recruitment of Participants

Aloha. I'm working on a research project investigating the relationship between yoga and well-being and would very much appreciate your help in supporting this yoga research! If you'd like to help out and have been practicing yoga for at least one month, twice a week or more, I have a questionnaire investigating the psychological reactions to yoga that will take 15 - 20 minutes to complete. All completed questionnaires will go into this big box—all participants will remain anonymous, and no personal identifying information will be included with the research results. So if you'd like to support this yoga research I'll be distributing questionnaires and pencils outside. Does anyone have any questions?

Appendix H: Consent Sheet Handout

AGREEMENT TO PARTICIPATE IN

The University of Hawai'i Study on Well-Being  
Grace Lee, M.A., Principal Investigator  
Department of Psychology  
University of Hawai'i at Mānoa  
2430 Campus Road  
Honolulu, HI 96822  
(808) 956-8414  
[gwlee@hawaii.edu](mailto:gwlee@hawaii.edu)

By participating in this research, you will be helping researchers at the University of Hawai'i investigate the relationship between yoga and well-being. Your participation will consist of completing the attached questionnaire which should take about 15-20 minutes. Approximately 150 people will be participating in the study. All participants will remain anonymous, and no personal identifying information will be included with the research results.

Although participating in this research may not be of direct benefit to you personally, it is believed that the results from this project may provide insight into psychological reactions to yoga, thus benefiting our psychological understanding of yoga and its practice in the West.

Your participation is voluntary. The investigator believes there is little or no risk to participating in this research project. Should you feel uncomfortable, you may withdraw your consent at any time during the duration of the project with no penalty. Please be assured that your answers will be kept strictly confidential to the extent allowed by law. Agencies with research oversight, such as the University of Hawai'i Committee on Human Studies (the agency responsible for the protection of research participants), have the authority to review research data. All research records will be stored securely.

If you have any questions regarding this research project, please contact the primary investigator, Grace Lee, at the UH Department of Psychology, 956-8414.

If you cannot obtain satisfactory answers to your questions or have comments or complaints about your treatment in this study, contact: Committee on Human Studies, University of Hawai'i, 2540 Maile Way, Honolulu, Hawai'i 96822. Phone: (808) 956-5007.