COMPARISON OF THE EXPERIENCE OF FOOD RESTRICTION BETWEEN
FASTING BUDDHIST MONKS/NUNS AND AMERICAN LAY BUDDHISTS

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Abstract

The presented study was intended to investigate the subjective experience of hunger and mechanisms for coping with hunger in Tibetan Buddhist monks/nuns and in Americans who practice Tibetan Buddhism as lay people. The experience of hunger between male and female participants was also compared. This was exploratory research on a topic that had not been studied previously. One hundred monks and nuns, and 26 lay practitioners were administered a self-report questionnaire comprising three parts focused on: 1) the subjects’ opinions about the Buddhist fasting practice of Nyungne; 2) the capacity to stand hunger; 3) mechanisms for coping with hunger. Subjects’ general experience with hunger was similar to instances described in the literature, and they valued most those mechanisms for coping with hunger which were related to Buddhist spirituality and philosophy. The differences detected between the groups may reflect cultural differences and varying degrees of religious devotion. No significant differences were detected between male and female participants.
# Table of Contents

Abstract................................................................................................................................ii
List of Tables.......................................................................................................................v
List of Figures...................................................................................................................viii
Chapter 1. Introduction.......................................................................................................1
Chapter 2. The Experience of Hunger................................................................................4
   Animal Models of Semi-Starvation – Physiological Effects........................................4
   Animal Models of Semi-Starvation – Behavioral Effects..............................................5
   Naturalistic Instances of Starvation in Humans............................................................5
   Experimental Restriction - the Minnesota Experiment..................................................6
   Experimental Restriction - Other Studies......................................................................8
   Biosphere 2 Project.....................................................................................................9
   Calorie Restriction for Longevity (CRL).......................................................................10
   Dieting..........................................................................................................................10
   Eating Disorders.........................................................................................................11
   Total Fasting – Scientific Studies................................................................................12
   Total Fasting – Hunger Strikes....................................................................................12
   Alternate-Day Fasting..................................................................................................13
   Sex Differences in the Experience of Fasting.............................................................14
   The Experience of Hunger in Different Religions.........................................................15
Chapter 3. Tibetan Buddhist Meditation Techniques.......................................................19
Chapter 4. Summary.........................................................................................................20
   Total Fasting..................................................................................................................20
   Semi-starvation...........................................................................................................20
   Intermittent Fasting.....................................................................................................20
   Research on Tibetan Buddhists....................................................................................21
Chapter 5. Purpose..........................................................................................................22
Chapter 6. Methods..........................................................................................................23
   Participants and Recruitment......................................................................................23
   Procedures and Measures...........................................................................................24
   IRB Considerations.....................................................................................................27
Chapter 7. Results.............................................................................................................28
  General Characteristics of the Samples........................................................................28
  Statistical Analysis of the Data..................................................................................28
  Part 1 of the Questionnaire – Subjects’ Opinions about the Practice of Nyungne and Nyungne-Related Hunger.................................................................29
  Part 2 of the Questionnaire – Constructs Related to the Subjective Experience of Hunger....................................................................................................................32
  Part 3 of the Questionnaire – Constructs and Groups of Items Related to Various Mechanisms for Coping with Hunger.................................................................35
  Factor Analysis of Part 3 of the Questionnaire......................................................45
Chapter 8. Discussion.......................................................................................................50
Appendix A. The Questionnaire Guidelines Presented to Monks and Nuns who Volunteered to Take Part in the Study.................................................................62
Appendix B. The Version of the Questionnaire Administered to Tibetan Buddhist Monks and Nuns.............................................................................................................63
Appendix C. The Questionnaire Guidelines Presented to American Lay Tibetan Buddhists who Volunteered to Take Part in the Study......................................................77
Appendix D. The Version of the Questionnaire Administered to American Lay Tibetan Buddhists.............................................................................................................78
Appendix E. Groups of Questions and Constructs Used in the 2nd and 3rd Part of the Questionnaire.....................................................................................................................79
Appendix F. Statistical Tables..........................................................................................84
  Part 1 – Two-Way ANOVA........................................................................................84
  Part 2 – T-Tests........................................................................................................98
Appendix G. Factor Analysis for Tibetan Version of Questions 33-72.........................102
References........................................................................................................................104
List of Tables

Table 1. Questionnaire items overlapping with Factor 1 ................................................. 46
Table 2. Questionnaire items overlapping with Factor 2 ................................................. 47
Table 3. Questionnaire items overlapping with Factor 3 ................................................. 48
Table 4. Questionnaire items overlapping with Factor 4 ................................................. 49
Table 5. Two-Way ANOVA. DV: Question 6 ................................................................. 84
Table 6. Two-Way ANOVA. DV: Question 8 ................................................................. 84
Table 7. Two-Way ANOVA. DV: Question 9 ................................................................. 85
Table 8. Two-Way ANOVA. DV: Question 10 ............................................................... 85
Table 9. Two-Way ANOVA. DV: Question 11 ............................................................... 85
Table 10. Two-Way ANOVA. DV: Question 12 .............................................................. 86
Table 11. Two-Way ANOVA. DV: Question 13 .............................................................. 86
Table 12. Two-Way ANOVA. DV: Question 14 .............................................................. 86
Table 13. Two-Way ANOVA. DV: Question 15 .............................................................. 87
Table 14. Two-Way ANOVA. DV: Question 16 .............................................................. 87
Table 15. Two-Way ANOVA. DV: Construct 1 ............................................................... 87
Table 16. Two-Way ANOVA. DV: Construct 2 .............................................................. 88
Table 17. Two-Way ANOVA. DV: Question 33 .............................................................. 88
Table 18. Two-Way ANOVA. DV: Question 34 .............................................................. 88
Table 19. Two-Way ANOVA. DV: Question 35 .............................................................. 89
Table 20. Two-Way ANOVA. DV: Question 36 .............................................................. 89
Table 21. Two-Way ANOVA. DV: Construct 4 .............................................................. 89
Table 22. Two-Way ANOVA. DV: Question 37 .............................................................. 90
Table 23. Two-Way ANOVA. DV: Question 38 ...............................................................90
Table 24. Two-Way ANOVA. DV: Question 41 ...............................................................90
Table 25. Two-Way ANOVA. DV: Question 43 ...............................................................91
Table 26. Two-Way ANOVA. DV: Question 44 ...............................................................91
Table 27. Two-Way ANOVA. DV: Question 45 ...............................................................91
Table 28. Two-Way ANOVA. DV: Question 46 ...............................................................92
Table 29. Two-Way ANOVA. DV: Question 47 ...............................................................92
Table 30. Two-Way ANOVA. DV: Question 48 ...............................................................92
Table 31. Two-Way ANOVA. DV: Construct 5 ...............................................................93
Table 32. Two-Way ANOVA. DV: Question 52 ...............................................................93
Table 33. Two-Way ANOVA. DV: Question 53 ...............................................................93
Table 34. Two-Way ANOVA. DV: Question 54 ...............................................................94
Table 35. Two-Way ANOVA. DV: Question 55 ...............................................................94
Table 36. Two-Way ANOVA. DV: Question 56 ...............................................................94
Table 37. Two-Way ANOVA. DV: Construct 6 ...............................................................95
Table 38. Two-Way ANOVA. DV: Question 67 ...............................................................95
Table 39. Two-Way ANOVA. DV: Question 68 ...............................................................95
Table 40. Two-Way ANOVA. DV: Question 69 ...............................................................96
Table 41. Two-Way ANOVA. DV: Question 70 ...............................................................96
Table 42. Two-Way ANOVA. DV: Question 71 ...............................................................96
Table 43. Two-Way ANOVA. DV: Question 72 ...............................................................97
Table 44. Comparison of Tibetan and American Men – T-Tests and Equality of Variances ...............................................................98
Table 45. *Comparison of Tibetan and American Women – T-Tests and Equality of Variances* ...........................................................................................................................................99

Table 46. *Comparison of Tibetan Men and Women (Monks and Nuns) – T-Tests and Equality of Variances* ...........................................................................................................................................100

Table 47. *Comparison of American Men and Women – T-Tests and Equality of Variances* ...........................................................................................................................................101

Table 48. *Inter-Factor Correlations* .................................................................................................................................102

Table 49. *Rotated Factor Pattern (Standardized Regression Coefficients)* .................................................................103
List of Figures

Figure 1. Three most important things about Nyungne practice. Comparison of the Tibetan group and the American group.................................................................31

Figure 2. Pattern of responses of Tibetan and American participants to Question 26 (When I am restricting food intake, I get drowsy more easily.).................................34

Figure 3. Localization of hunger in the body during restricting food intake. Comparison of Tibetans and Americans.................................................................35

Figure 4. Pattern of responses of Tibetan and American participants to Question 57 [To cope with restriction of food intake, it would be helpful to engage in spiritual practice (e.g., pray, meditate).].................................................................40

Figure 5. Pattern of responses of Tibetan and American participants to Question 58 (To cope with restriction of food intake, it would be helpful to ask Buddha or God for help with resisting hunger.)..................................................41

Figure 6. Pattern of responses of Tibetan and American participants to Question 61 (To cope with restriction of food intake, it would be helpful to keep in mind that there are people in the world who suffer from hunger more than I do.)...............................................................................................................42

Figure 7. Pattern of responses of Tibetan and American participants to Question 65 (To cope with restriction of food intake, it would be helpful to accept the feeling of hunger).................................................................................................43

Figure 8. Pattern of responses of Tibetan and American participants to Question 72 (To cope with restriction of food intake, it would be helpful to stay relaxed.)...............................................................................................................45

Figure 9. Scree Plot of Eigenvalues........................................................................102
Chapter 1. Introduction

All healthy human beings experience hunger. Every day, hunger reminds us about delayed or skipped meals, and prompts us to consume food energy sufficient to maintain physiological functions. Problems with experiencing satiety after ingesting food [e.g., in Prader-Willi syndrome (Sadock & Sadock, 2003)] lead to overeating and contribute to obesity and obesity-related health problems. Eating too much has become a problem in Western countries and has resulted in an increase of the percentage of population that suffers from type 2 diabetes mellitus and atherosclerosis.

Efforts to resist hunger and abstain from eating can serve many different purposes. Followers of different religions engage in various kinds of fasts to purify their minds and bodies, focus on spiritual life, or strengthen their will (Ryan, 2005). Hunger strikers may express their political beliefs in this way (Russell, 2005). Fasting can be used for the treatment of some disorders, such as hypertension (Goldhamer et al., 2002). Many people deliberately reduce their daily food intake to decrease their body weight for health or cosmetic reasons (Russell, 2005). Practitioners of calorie restriction for longevity (CRL) deliberately reduce their food intake, and face chronic hunger, in hope of achieving health benefits (Vitousek, Gray, & Grubbs, 2004). Moreover, resisting hunger and drastically cutting down food intake can be signs of a severe mental problem, as in the case of anorexia nervosa (Beumont, George, & Smart, 1976).

Because of their experience with dieting, many Westerners are aware that it is difficult to resist sustained hunger. The high rate of weight regain after successful dieting suggests that hunger becomes difficult to endure over long periods of time. What few Westerners have experienced is the effect of prolonged semi-starvation, especially at subnormal weight levels. From personal accounts and observations of people subjected to semi-starvation (e.g., Hornbacher, 1998; Keys, Brozek, Henschel, Mickelson, & Taylor, 1950) and from studies of animals subjected to calorie restriction (Vitousek et al., 2004), it is clear that long-standing hunger has disruptive influence on mood and behavior. Unfortunately, because of the difficulty of conducting research on long-term fasting in humans, few scientific studies have examined the psychological effects of prolonged hunger.
The experience of severe hunger is worthy of closer study in part because hunger-related symptoms constitute impediments to the successful control of obesity. Understanding more about the human experience of hunger can help us better comprehend eating disorders and obesity, and thus may contribute to the development of new and more effective psychological treatment techniques. Moreover, knowledge of the human experience of hunger can help us better judge the risks and benefits of CRL (Vitousek, Gray et al., 2004; Vitousek, Manke, Gray, & Vitousek, 2004).

There is a variety of means people may use to cope with hunger during periods of restricted food intake. Individuals may attempt to cope with hunger using pharmacological strategies (e.g., appetite suppressants), behavioral strategies (e.g., distraction techniques, or seeking environmental support), and cognitive strategies (e.g., focusing on the importance of restriction or reframing restriction by envisioning it as stronger or more admirable than unrestrained eating). In some contexts, as in the case of fasting Tibetan Buddhist clergy, people may also adopt spiritual practices such as accepting restriction and hunger-related feelings.

This study focuses on severe and repeated cycles of restriction that result from participating in a religious Tibetan Buddhist fasting practice called Nyungne. This practice includes periods of strict fasting and periods of moderate eating (Rinpoche, 2004). The two groups of Tibetan Buddhists included in this study, Tibetan monks/nuns and American lay Buddhists, consisted of individuals who had participated in Nyungne and, therefore, had some experience with fluctuating hunger.

Tibetan Buddhists are interesting objects of hunger-related research because during Nyungne they use fasting as one aspect of their meditative practice. No studies have examined how Buddhists who engage in religious fasting experience repeated periods of hunger. It is possible that broad cultural issues and the specific situational context of Nyungne may influence the experience of hunger and the strategies employed to cope with it. This project was designed as a pilot study aimed at shedding some light on these issues.

While doing research on hunger, it is important to consider the variables influencing the experience, e.g., the duration and severity of restriction. The longer the restriction the more difficult hunger is to cope with (Russell, 2005). Another factor influencing the
experience of fasting is the nutritional adequacy of the diet (Pirke et al., 1986) or, in the case of total fasting, the presence or lack of vitamin and micronutrient supplementation (O'Malley, 2001). Different kinds of restriction (e.g., total fasting versus dieting) also affect the intensity of the reported hunger (Lappalainen, Sjoden, Hursti, & Vesa, 1990). During Nyungne, practitioners engage in intermittent fasting which is associated with higher degree of hunger than sustained total fasting (Lappalainen et al., 1990). The initial weight of the person is another factor influencing the length of fasting period he or she is able to engage in (Stewart & Fleming, 1973). Moreover, the sex of the person influences his or her experience of food restriction, in terms of subjective physical and psychological discomfort, and objective physiological findings (Del Parigi et al., 2002; Marsh, 1916). The context and motives for engaging in restriction should also be taken into account. Because of the spiritual importance ascribed to the practice, Buddhists engaging in Nyungne may be more motivated to face hunger than patients who are advised to lose weight because of the health risks associated with obesity.

Although there is a substantial body of hunger-related literature available, it would be inappropriate to generalize across all of them because of differences on these and other dimensions. Even though the core “semi-starvation syndrome” is remarkably consistent across contexts as discussed in the next section, qualitative and quantitative differences across instances of restriction described in the literature can be expected. It should not be assumed that the range and severity of starvation symptoms experienced by a concentration camp prisoner are indistinguishable from those of a dieter, or that, after 30 days of strict fast, a person will experience hunger in the same way as someone who engages in every-other-day fasting for the same length of time.
Chapter 2. The Experience of Hunger

Although hunger is experienced by every human being, relatively little attention has been paid to it in terms of its influence on psychological well-being. The available sources of information on semi-starvation and its influence on behavior include: descriptions of semi-starvation in animal models, naturalistic and experimental instances of semi-starvation in humans, and the phenomenon of calorie restriction for longevity. Other sources of data include studies of dieting, observations of patients suffering from eating disorders, and accounts of total and alternate-day fasting.

Animal Models of Semi-Starvation – Physiological Effects

Positive physiological changes observed in animals subjected to caloric restriction include slowing of aging and increased life span (McCay, Crowell, & Maynard, 1935; McCay, Maynard, Sperling, & Barnes, 1939), decreased metabolic rate (Heilbronn & Ravussin, 2003), positive cardiovascular changes and higher resistance to some age-related disorders (for review see Vitousek, Gray, et al., 2004), decreased blood serum insulin levels (Roth et al., 2002), and better resistance to high environmental temperatures than control animals (Heydari, Wu, Takahashi, Strong, & Richardson, 1993).

Physiological costs of caloric restriction in animals include smaller body size, growth retardation (McCay et al., 1935), intolerance of cold (McCay et al., 1939), hormonal changes (Fichter & Pirke, 1995), increased susceptibility to some infections, delayed sexual maturation, and decreased fertility or infertility (for review, see Vitousek, Gray, et al., 2004). From observations in humans subjected to semi-starvation it is known that negative physical and physiological effects can contribute to the negative psychological changes observed in individuals (Tucker, 2006).

Most relevant to the study on Tibetan Buddhists is research on calorie restriction in the form of alternate-day fasting (water fast every second day and ad libitum diet on alternate days). Many findings detected under these conditions are similar to positive physiological changes observed in animals subjected to continuous restriction (Anson et al., 2003; Varady & Hellerstein, 2007). Moreover, increased neuronal resistance to excitotoxin damage (Anson et al., 2003), beneficial effects on adipose tissue physiology (for review see Varady & Hellerstein, 2008), and increased resistance of myocardium to
hypoxia (Varady & Hellerstein, 2007) were detected. Unfortunately, these studies did not look into the effects of this form of calorie restriction on the behavior of animals.

**Animal Models of Semi-Starvation – Behavioral Effects**

Calorie restriction significantly influences the behavior of animals. Rodents subjected to calorie restriction show heightened activity, especially around mealtime (Fichter & Pirke, 1995) which seems to be a result of their hunger. Higher frequency of environmental exploration by calorie-restricted adult male rats (Govic, Levay, Kent, & Paolini, 2009) may also be explained as food-searching behavior. Calorie-restricted rodents are more aggressive (Lore, Gottdiener, & Delahunty, 1986), are more prone to hoarding (Fantino & Cabanac, 1980), and are less effective parents (Smart & Preece, 1973). Primates subjected to calorie restriction engage in motor stereotypies [e.g., rocking, licking (Weed, Lane, Roth, Speer, & Ingram, 1997)], food-oriented behavior (Weiss, 1997 cited in Vitousek, Gray et al., 2004), mealtime restlessness, and aggressive behavior (for review see Vitousek, Gray et al., 2004). All available data suggest that long-term hunger is an experience that influences the behavior of rodents and primates in strong and generally negative ways.

**Naturalistic Instances of Starvation in Humans**

An example of scientific study of the effects of imposed semi-starvation is the work of Helweg-Larsen et al. (1952) who studied 1282 Danes who had been interned in German concentration camps during World War II. Among other questions, the researchers wanted to investigate the reactions of the prisoners to starvation. The studied individuals presented with many physical signs and symptoms, including decreased body temperature, slow heart rate, diarrhea, and dermatological problems. Semi-starvation also had a profound impact on the prisoners’ psychological functioning. They presented with apathy, depression, and irritability. They were preoccupied with food and developed unusual eating habits. Moreover, they had a tendency to binge-eating subsequent to release (Helweg-Larsen et al., 1952).

Another example of natural semi-starvation is famine. The most famous examples include the Great Hunger of Ireland (1845-1850) that affected more than a million people, the 1919-1921 hunger in Ukraine which killed seven million victims (Russell,
In German-occupied Poland during World War II, chronic hunger was experienced by Jews in Warsaw Ghetto (Krall, 2000). In children, psychological deterioration was identified as the first symptom of starvation. They became uninterested in play; were more irritable, and experienced insomnia (Russell, 2005).

Adults suffering from famine disease in the Warsaw ghetto showed diminished emotional expression, apathy, slowed thinking, and drowsiness. At the sight of food, they became aggressive and ate voraciously even though they were at risk of being beaten by other people who wanted to get the food. Instances are described of adults attacking children who had food; in another case, a mother tried to eat the body of her deceased child (Krall, 2000). Instances of cannibalism were also reported during the 1932-1933 Ukrainian famine and during the Siege of Leningrad in 1941 (Russell, 2005).

**Experimental Restriction - the Minnesota Experiment**

The Minnesota experiment which started at the end of 1944 was the most important scientific human hunger study. During this study, 36 men were subjected to 6 months of semi-starvation, with an average 50% reduction of their baseline calorie intake (Keys et al., 1950; Tucker, 2006). The participants were all physically healthy males between 20 and 33 years of age and within the normal weight range. Measurement by Army Selection Test revealed that the volunteers were intellectually superior to the general population, and the Minnesota Multiphasic Personality Inventory (MMPI) confirmed that they were emotionally balanced (Keys et al., 1950; Tucker, 2006). During the experiment, they were required to lead an active lifestyle and walk twenty-two miles per week (Tucker, 2006). There were four phases of the study: a 12-week, control phase of normal diet - on the average, 3210 kcal/day; a 24-week phase of restricted food intake averaging 1570 kcal/day; a 12-week restricted rehabilitation phase with controlled calorie intake that varied between groups; and, for a subset of 12 participants, an 8-week phase of free rehabilitation with *ad libitum* cafeteria diet (Tucker, 2006). During the semi-starvation phase, the participants were given 2 meals per day of low-meat diet that provided sufficient supply of vitamins (Tucker, 2006). The mean weight loss of the
subjects was 24%; their average weight decreased from 153 lbs to 115 lbs (Keys et al., 1950; Tucker, 2006).

The semi-starvation had a profound effect on the participants. The men complained of being tired, dizzy, having sore muscles, being oversensitive to loud sounds, and suffering from “hunger pain” (Brozek, 1950). All of them presented with decreased body temperature, pulse, blood pressure, and resting metabolic rate (Tucker, 2006). Their reflexes were slower. They complained of cold intolerance and gastrointestinal problems. Moreover, the subjects presented with edema, polyuria, and nocturia (Keys et al., 1950, Tucker, 2006). Their reproductive functions were suppressed, with decreased volume of the ejaculate and sperm motility (Brozek, 1950). In addition, they exhibited hair loss, visual disturbances, and paresthesias (Garner, 1997).

The findings most relevant to the topic of research on Tibetan Buddhists were the effects of semi-starvation on the psychological functioning of the Minnesota study participants. All of the men showed increased food preoccupation and diminished non-food-related concerns. Their conversations were often food-focused, and some started planning to pursue food-related professional careers after the end of the experiment. Many of them began collecting cookbooks and recipes. They found pleasure in watching people who were eating in public places. In the movies, the only interesting moments for them were scenes of people eating. Moreover, some of the men reported having vivid, food-focused dreams (Tucker, 2006). All the participants complained of feeling very hungry. During the semi-starvation phase of the experiment, the men’s self ratings revealed significant food preoccupation and the felt desire for food (Brozek, 1950). Food acquired for them strong incentive value as sexual objects for healthy men. The efforts of the men directed at increasing the pleasure derived from eating resulted in slower eating and attraction to unusual food mixtures and strong tastes. In efforts to decrease their hunger, the participants used substitutes for food (e.g. chewing gum) and drank large volumes of liquids. Some of the subjects developed bizarre eating rituals. To prevent eating extra food, the researchers had to implement a buddy system; the participants were not allowed to leave the laboratory alone (Keys et al., 1950; Tucker, 2006). It is worth noting that the symptoms experienced by the Minnesota study participants took time to
normalize after the end of the experiment. Even after 12 weeks of rehabilitation, they continued to crave additional food (Brozek, 1950).

The psychological complaints, self-rated by the men on a scale from 0 to 5, that received highest average scores included Appetite (3.1), and Irritability and Apathy (1.8). Other complaints included Loss of Ambition, Loss of Self-Discipline, Decrease in Mental Alertness, and Decrease in the Ability to Concentrate (from -1.8 to -1.6) (Brozek, 1950). They also complained of distractibility (Keys et al., 1950). The participants showed statistically- and clinically-significant increases on the Depression, Hypochondriasis, and Hysteria scales of the MMPI (Brozek, 1950). Moreover, they presented with sexual disinterest with cessation, or drastic decrease in frequency, of dates, masturbation, nocturnal emissions, and sex dreams. Their self-reports revealed marked decrease in sex drive (Brozek, 1950).

Other reported symptoms included mood swings, outbursts of anger, neglect of personal hygiene, pseudo-psychotic disturbances, social withdrawal, and isolation. Although intellectual testing did not reveal deterioration of intellectual abilities, the men subjectively complained of poor concentration and comprehension (Garner, 1997).

The Minnesota study was the first broad, systematic study that showed the destructive effects of prolonged hunger due to semi-starvation on human body and psychological functioning.

**Experimental Restriction - Other Studies**

An interesting study on intermittent dieting is the work of Laessle, Platte, Schweiger, & Pirke (1996) done on nine female, non-obese, unrestrained eaters who reduced their caloric intake down to maximum 600 kcal/day on Tuesdays, Wednesdays, Thursdays and Fridays for 4 weeks, eating *ad libitum* on other days. In addition to assessing physiological parameters, the researchers used five-point scales (from 0 – not at all to 4-always) to measure: 1) preoccupation with food and eating; 2) drive to eat more than allowed; 3) impulse to overeat; and 4) fear of loss of control over eating. Moreover, analog scales were used to rate irritability, mood, and ability to concentrate. Moderate weight loss (mean: 2.3 kg) was recorded during the experiment. During dieting periods, the participants experienced: fatigue, hunger, food and eating preoccupation, mood deterioration, irritability, decreased ability to concentrate, increase in drive to eat
more than allowed, and increase in the fear of loss of control. The measurements of blood triiodothyronine revealed long-term adaptation to food restriction in the metabolism of the participants (Laassle et al., 1996).

**Biosphere 2 Project**

The Biosphere 2 project was designed for investigation of human life in a large, sealed complex containing several different habitats. Eight people lived within the complex for two years from 1991 to 1993 (Walford, Mock, MacCallum, & Laseter, 1999). The participants had to prepare food themselves out of what they harvested (Alling, Nelson, & Silverstone, 1993). Unfortunately, due to insufficient sunlight and insect pests, the crops failed to provide as many calories as anticipated (Walford et al., 1999). Moreover, insufficient food supply for farm animals resulted in lower supply of animal proteins. The average weight loss observed was 21% for the men and 14% for the women (Walford, Mock, Verdery, & MacCallum, 2002). One of the participants, Roy Walford, was a CRL researcher and practitioner who recognized the research potential of this unintended experiment in human semi-starvation (Vitousek, Gray et al., 2004). After the end of the experiment, Walford reported that the participants of Biosphere 2 experienced many positive physiological changes (Verdery & Walford, 1998; Walford et al., 1999; Walford et al., 2002; Weyer et al., 2000) which were consistent with the findings in animal models of calorie restriction. These positive changes disappeared soon after the project crew members were released and returned to unlimited diets (Vitousek, Gray et al., 2004).

The accounts of the project participants indicated that the positive physiological findings were accompanied by negative psychological changes. They had less energy, and many of them started having a nap after lunch. They also engaged in different forms of food fantasizing. Often, the amount of food served for meals was not satisfactory. Some members of the crew chewed food substitutes (fennel leaves, banana skins) to decrease hunger; others hoarded part of their rations. Occasionally, the participants organized “feasts” to enjoy the feeling of having a full stomach. Because the participants experienced constant hunger in between meals, they were very careful about equal distribution of food. Some cases of food stealing made the participants decide to install locks in the freezer and the storeroom (Alling et al., 1993; Poynter, 2006).
Calorie Restriction for Longevity (CRL)

Another source of information about the influence of chronic hunger on humans is the phenomenon of caloric restriction for longevity (for review, see Vitousek, 2004; Vitousek, Gray et al., 2004; and Vitousek, Manke et al., 2004). Because of the positive physiological effects observed in animals subjected to calorie restriction, CRL practitioners deliberately undergo semi-starvation resulting from decreased daily caloric intake. So far, several positive physiological effects of CRL (including alternate-day-fasting regimen) have been confirmed in humans (Fontana, Meyer, Klein, & Holloszy, 2004; Holloszy & Fontana, 2007; Johnson et al., 2007; Riordan et al., 2008; Varady & Hellerstein, 2008). Fasting has been reported to have positive effects in patients suffering from hypertension (Goldhamer, Lisle, Parpia, Anderson, & Campbell, 2001; Goldhamer et al., 2002), rheumatoid arthritis (Muller, de Toledo, & Resh, 2001), and autoimmune disorders (Kuchroo & Nicholson, 2003).

No systematic studies have examined psychological changes in CRL practitioners, as the principal interest of the CRL research field has been focused on physiological effects. The few available data converge with those from the Minnesota study, animal studies, and observations of patients suffering from anorexia nervosa. Anecdotal material suggests that CRL practitioners are preoccupied with food and feel pride for being able to follow their dietary regimen. They may show some food phobias and obsessions, and may have tendency to indulging in binge-eating episodes. They are sensitive to low environmental temperature, uninterested in sex, and socially withdrawn (Manke & Vitousek, 2002; Vitousek, 2004).

Dieting

Humans also undergo periods of hunger due to reduction of caloric intake in the context of dieting. (Dieting is defined as “a self-initiated attempt to restrict food intake for the purpose of weight control”, while the term dietary restraint refers to “any type of self-imposed food restriction”; Lowe, 2002). Available data suggest that restrained eaters experience some psychological effects seen in the context of food restriction. They are food-preoccupied (McFarlane, Polivy, & McCabe, 1999) and, compared to unrestrained eaters, sensitive to food-related information (Herman, Ostovich, & Polivy, 1999; Papies, Stroebe, & Aarts, 2007).
Psychological changes observed in dieting include irritability (Polivy & Herman, 2002). Moreover, in response to emotional distress, restrained eaters increase their caloric intake more substantially than controls (Polivy & Herman, 2002). Research suggests that restricted eaters are more anxious and depressed than people who do not diet, and have lower self-esteem (it is unclear if these differences precede or follow restraint). Moreover, restricted eaters are at risk of developing an eating disorder (McFarlane Polivy, & McCabe, 1999).

Coping tactics used by restrained eaters can include categorizing food as acceptable or forbidden (Polivy & Herman, 2002), and cigarette smoking to assist in controlling food intake and weight (Polivy & Herman, 2002).

**Eating Disorders**

Eating disorders, especially anorexia nervosa, are psychological disorders in which patients experience hunger-related symptoms. There is a prevalence of females among eating-disordered patients (Robb & Dadson, 2002; Touyz, Kopec-Schrader, & Beumont, 1993). Eating disorders result in many medical and physiological symptoms (for reviews see Fichter & Pirke, 1995, and Garner & Garfinkel, 1997).

In anorexia nervosa, apart from reducing caloric intake, patients engage in different forms of purging (e.g., vomiting, laxatives) and physical exercise in order to reduce their body weight (Touyz et al., 1993). Similarly to victims of natural and imposed starvation and the Minnesota experiment volunteers, they present with strong preoccupation with food and food-related cues (Beumont et al, 1976) and constant hunger (Manke & Vitousek, 2002), although the experiences are often denied. Psychological changes observed in patients include symptoms of depression, anxiety, dysphoria, sexual disinterest, and reported lower quality of life (Beumont, 2002; Herpertz-Dahlmann et al., 2008; Laessle, Schweiger, & Pirke, 1988).

Coping tactics adopted by patients include attempts of prolongation of pleasure derived from eating (e.g., by choosing eating-intensive foods), strange eating habits, and occasional binge eating (Vitousek & Gray, 2002). Because of the difficulty of facing constant hunger, anorexics can, over years, become increasingly susceptible to binge-eating episodes (Polivy, 1996).
Total Fasting – Scientific Studies

Total fasting produces a somewhat different pattern of psychological and physiological changes from those seen in calorie restriction. Among other factors, this effect results from different metabolic adaptations and different intensity of hunger experienced.

One of the first scientific studies investigating the influence of total fasting on human body was an experiment during which a man drank only 900 cm$^3$ of distilled water a day for one month (Benedict, 1912). During the study, various physiological data were collected. The researcher remarked that the man’s mental condition remained quite good during the experiment (Benedict, 1915).

Another example of this kind of study was performed in Scotland where an obese man fasted for 382 days. He was allowed ad libitum non-caloric fluids, and he received some supplementation of micronutrients to keep his vitals stable. The researchers collected substantial physiological data (Stewart & Fleming, 1973); unfortunately, no information on the man’s mental condition was reported.

One of the early fasting studies with two participants consisted of one week of gradual reduction of food intake, one week of water-only fast, and one week of gradual refeeding (Marsh, 1916). The researcher, who himself was a participant in the study, reported decreases in the vitality and strength of the subjects, and slower speed of activities. Subjective reports from participants revealed complaints of physical and psychological discomfort with differences between the one male and one female who volunteered for the study (Marsh, 1916). These suggestive findings are supported by contemporary observations of different physiological responses in the human male and female brain to hunger and satiation (Del Parigi et al., 2002). Unfortunately, psychological differences between sexes in response to starvation have not been studied systematically so far.

It is worth noting that there are also metabolic differences between lean and obese subjects who are subjected to total starvation (Elia, Stubbs, & Henry, 1999).

Total Fasting – Hunger Strikes

Another example of the human experience of prolonged total fasting is the phenomenon of hunger strikes. In the case of striking prisoners, there are different
reasons for refusing food (for review see Brockman, 1999), and the reactions of the prison staff to hunger strikes can vary from passive observation (O'Malley, 1990) to using restraints and means of force-feeding (Annas, 2006).

People who engage in hunger strikes suffer from weakness and hunger, and are preoccupied with food. Mahatma Gandhi, who was an experienced hunger striker, was aware of these phenomena. For this reason, during his fasts he followed several coping tactics which included conserving mental and physical energy, and attempting to avoid thinking about food and fasting (Russell, 2005).

In 1981, the strike at the Maze prison near Belfast, United Kingdom, resulted in 12 deaths that occurred between 46th and 73rd day of food refusal. The strikers stopped feeling hunger after the initial four days [a phenomenon seldom observed in people who restrict calorie intake without complete food abstention; (Keys et al., 1950; Tucker, 2006)]. In spite of this, the strike participants experienced many physical symptoms similar to those mentioned in the section describing the Minnesota experiment. Because of vitamin and electrolyte depletion, the prisoners experienced additional negative side effects, such as cardiac arrhythmias and vomiting (O'Malley, 1990). About a week before death, their consciousness became clouded which was described “as drowsiness, inattentiveness, disorientation, gross misinterpretations and misidentifications” (O'Malley, 1990, p. 115).

**Alternate-Day Fasting**

Studies of intermittent fasting are particularly relevant to this research on Tibetan Buddhists who participate in a fasting practice during which they eat only one meal every second day. Heilbronn, Smith, Martin, Anton, & Ravussin (2005) studied eight men and eight women, 23-53 years old, with BMIs ranging from 20.0 to 30.0, who fasted every second day for 22 days. The fast lasted from midnight until midnight of the next day. During this time, the subjects consumed only non-caloric beverages (including tea and coffee) and sugar-free gum. Every other day was a “feasting day” during which the subjects were allowed to eat *ad libitum*. They were informed that doubling of their caloric intake would be necessary to prevent the loss of body weight. The study participants were assessed at baseline and during the experiment. Final assessment was done on day 22, after a fast of 36 hours. The researchers examined several biochemical
parameters and psychological well-being of the subjects (self-reports of hunger, fullness, desire to eat, prospective food consumption, and satisfaction; these data were obtained using visual analogue scales). Using the Eating Behaviors Questionnaire, the male participants self-reported they had usually eaten 1-2 big meals a day, while women had tended to be careful about what food they ate.

The physiological changes observed in the subjects included loss of weight (approximately 2.5%), decrease of fat and fat-free mass, rise in fat oxidation and reduction in carbohydrate oxidation. There were significant differences between men and women in the fasting blood serum concentrations of glucose, HDL, LDL, triacylglycerol, fatty acids, insulin, and ghrelin (Heilbronn et al., 2005).

Comparison of baseline data to data obtained after the first day of fasting revealed an increase in the subjective perception of hunger and a reduction in perceived fullness. Comparison of data gathered on days 1, 7, 15, 21, however, revealed that over time the participants did not experience changes in feelings of hunger, desire to eat, thirst, or satisfaction (Heilbronn et al., 2005). The researchers concluded that the participants did not “adapt” to the experimental conditions, at least over the limited period of the test, with the exception of a small increase in the subjective fullness (Heilbronn et al., 2005).

The results of this experiment suggest that, contrary to prolonged total fasting (Lappalainen et al., 1990; O'Malley, 1990) and similarly to semi-starvation (Keys et al., 1950; Tucker, 2006), alternate-day fasting does not decrease perceived hunger. As periods of total fasting do not exceed 48 hours in Nyungne, it can be expected that practitioners do not experience decrease in the feeling of hunger over time.

**Sex Differences in the Experience of Fasting**

As mentioned in the section on scientific studies of total fasting, a small study done by Marsh (1916) suggested that there might be sex differences in the experience of hunger. The experiment consisted of one week of gradual reduction of food intake, one week of water-only fast, and one week of gradual refeeding. During this time, the subjects completed many physiological and psychological tests. In the male participant, increased pain sensitivity and dots perceptivity was observed, along with decreased sensitivity for touch. In the female participant, the findings were opposite. Introspective records revealed that the man complained mainly of physical discomfort resulting from
fasting while the woman was mainly disturbed by emotional changes and the feeling of hunger, and experienced some food-focused dreams (Marsh, 1916). Clearly, no definite conclusions can be drawn from these two observations. Contemporary observations, however, have affirmed that male and female brains show different physiological responses to hunger and satiation (Del Parigi et al., 2002). Hungry men had greater neuronal activity in the temporal regions of the brain which are involved in the processing of emotions. Satiated women exhibited greater activity in the occipital region what may suggest visual imaginary involvement in the cognitive processing of satiety (Del Parigi et al., 2002; Russel, 2005).

The Experience of Hunger in Different Religions

As noted earlier, diverse forms of fasting are found in many religions and can serve many purposes, such as body and mind purification, focusing on religious life, developing self-discipline etc. In some new religious groups, fasting can be a form of control by leaders over members (Meikle, 2005).

Christianity has a long tradition of fasting. In Medieval times, dietary restraint was sometimes regarded an attribute of piety. Reports from this period describe saints who consumed only water or reduced their diet to eating only consecrated Host (Vanderyecken & van Deth, 1996). Reportedly, some were able to live in this way for years (e.g., Saint Angela of Foligno). Some Medieval fasters are described as having found food repulsive (e.g., Mary of Oignies). Modern cases of prolonged, religiously-based fasting occasionally occur (e.g., Theresa Neumann), but at present the Catholic Church is wary about regarding fasting a sign of sanctity (Vanderyecken & van Deth, 1996). There are many days in a year during which subgroups of observant Christians limit their intake (e.g., all Fridays in Lent in the case of some Catholics). The fasts usually are based on refraining from eating some foods (e.g., meat) and reducing caloric intake (Fasting By Faith, n.d.). In recent years, fasting is again gaining popularity among members of different Christian churches (Gardner, 1999).

In biblical times, Jews commonly fasted after the death of a family member. They reacted in a similar way to the destruction of the First and Second Temples. Members of some groups fasted several days every week and dedicated the merit to the benefit of some members of the society, e.g. infants, pregnant women. Pious Jews fasted on
Mondays and Thursdays, and Nazirites avoided consuming wine and grape products (Diamond, 2004).

In modern Judaism, seven days of total fasting (refraining from water and food) are prescribed annually. The fast lasts for 25 hours on Yom Kippur and Tisha B’Av and, on other days, from sunrise to sunset (Fasting By Faith, n.d.).

The most significant fast in Islam occurs in the month of Ramadan. During this period, Muslims refrain from eating, drinking, smoking, and sexual contacts from sunrise to sunset (Fasting By Faith, n.d.). Because of the intermittent nature of the fast, research on Ramadan is relevant to the study on Tibetan Buddhists who engage in the fasting practice of Nyungne. Studies show that the daytime fast of Ramadan results in increased fatigue accompanied by decreased activity (Waterhouse, Alkib, & Reily, 2008). The fast causes changes in sleep pattern: delayed bedtime and wake-up time, and increased incidence of daytime naps (BaHammam, 2003). Muslims observing the fast suffer from irritability and increased frequency of headaches (Leiper, Molla, & Molla, 2003) and depressed mood (Roky, Aadil, Houti, & Benaji, 2005). In spite of these negative changes, practitioners try to cultivate a peaceful state of mind and to avoid negative emotions (Toda & Morimoto, 2004). The fast increases hunger during the day (Finch, Day, Razak, Welch, & Rogers, 1998), and results in increased food and fluid ingestion in the early morning (to prepare for the daylight fast) and especially in the evening (to make up for the hours of fast) (Waterhouse et al., 2008). This period of changed eating patterns does not influence the eating behaviors of teenagers after the end of Ramadan (Erol, Baylan, & Yazici, 2008).

In early Taoism, practitioners tried to reduce drastically the amount of food they ate. Foods were regarded harmful because they impaired the circulation of energy in the body, which was believed to result in illness. The ultimate goal was to eat nothing and to drink as little as possible. The practitioners used techniques (e.g. swallowing air) to reduce their hunger and to nourish the body with cosmic energy. Fasting was one of the purification techniques which were supposed to result in an immortal body. Even though these practices were followed by the adepts, the fasts must have been only periodic (Eskildsen, 1998).
In Buddhism, monasticism is traditionally associated with fasting. Data on fasting in Tibetan Buddhism are scarce, and no research has examined the experience of hunger in Buddhists monks and nuns. In Buddhism, fasting is usually more moderate than in other religions. This may be partly attributed to the example of Buddha Shakyamuni who attained enlightenment and became Buddha only after he had stopped fasting. He chose the nutritional “middle way” – not to fast and not to eat too much (Ryan, 2005).

In Tibetan Buddhism, fasting may be related to vows taken by monks and nuns, semi-starvation during meditation retreats, or religious fasting practices. The vows taken by Tibetan novice monks and nuns include “Avoid accepting food that is more than one’s share” and “Avoid eating food after noon” (Thirty-Six Novice Vows, n.d.). The vows usually do not promote fasting as at the same time monks or nuns are directed not to refuse offered food. Unintentional semi-starvation might occur during solitary meditation retreats; however, it is always undesired as proper nutrition is believed to promote good meditation (Ray, 2001).

There are two religious fasting practices in Tibetan Buddhism: Tunmo and Nyungne. During Tunmo, a practitioner engages in a special kind of meditation resulting in increased bodily temperature (Ray, 2001). The increase in the meditator’s body temperature can reach 8.3 degrees Celsius (Benson, Malhotra, Goldman, & Jacobs, 1990).

The other fasting ritual is Nyungne, a practice aimed at accumulation of merit and wisdom, and purification of bad karma (Nyungne Retreats with Lama Dudjom Dorjee, n.d.). During this two-and-a-half-day-long practice, practitioners eat just one, *ad libitum* meal on the first day and do not restrict fluid intake; for the remaining one and a half days, participants do not eat or drink at all (Rinpoche, 2004). This practice can be repeated many times in sequence, such that practitioners do not eat or drink every second day, and every other day eat just one meal and do not restrict fluid intake. The practice is common among monastic and lay Tibetan Buddhists. It is also performed in some Buddhist centers in the United States (Nyungne Retreats with Lama Dudjom Dorjee, n.d.). As this practice, even if done for a long time, does not include complete abstention from food for more than 48 hours (practitioners eat every second day), it would be
expected not to lead to the diminishing of hunger associated with longer periods of total fasting (Lappalainen at al., 1990).

For many hours a day during Nyungne, practitioners engage in meditating, saying prayers, chanting mantras, and making prostrations (Rinpoche, 2004). They attempt to generate an attitude of love and compassion towards all sentient beings. They keep silence, apart from prayers and chanting, and refrain from intimate contacts for the duration of the practice (Nyungne Retreats with Lama Dudjom Dorjee, n.d.).

Foods which are used for preparing the meals that are eaten on alternate days during Nyungne are called "white" foods. These foods are believed to beneficially influence the practice of meditation. These foods include milk, butter, cheese, fruits, rice, wheat and vegetables (Nyungne Retreats with Lama Dudjom Dorjee, n.d.). During Nyungne, practitioners do not eat so-called "black" foods because they are believed to negatively affect meditation. These foods include fish, eggs, meat, onion, garlic, horseradish, radish, leeks, chives and beans (Nyungne Retreats with Lama Dudjom Dorjee, n.d.).
Chapter 3. Tibetan Buddhist Meditation Techniques

Meditation is inseparable from Tibetan Buddhism. In general, meditation techniques can be grouped into concentration meditation and mindfulness meditation. While engaging in concentration meditation, a practitioner uses breath, visualization, or saying mantra to focus the attention and achieve calming of mind (Ivanovski & Malhi, 2007). Mindfulness techniques are used to expand the awareness of the practitioner, for example by making him or her contemplate the suffering of the world (Ivanovski & Malhi, 2007). Different meditation styles, including Tibetan Buddhist meditation practiced during Nyungne, can incorporate both concentrative and mindfulness techniques (Ivanovski & Malhi, 2007; Rinpoche, 2004).

A number of studies have examined shifts in consciousness and brain function during meditation that did not include a fasting component (e.g., Benson et al., 1990; Carter et al., 2005; Lehmann et al., 2001; Lutz, Graischar, Rawlings, Ricard, & Davidson, 2004; Newberg et al., 2001). These studies have established that substantial changes do occur in the meditative state, including shifts in conscious awareness and physiological changes (e.g., altered brain electroactivity and blood flow).
Chapter 4. Summary

The experience of restriction has strong effects on human physiology and behavior. The influence of hunger on psychological functioning depends on the severity and length of restriction.

Total Fasting

In the case of total fasting, hunger persists for the initial days and then subsides. If the intake of water and micronutrients is adequate, an individual can function well for some time, depending on his or her fat reserves (Stewart & Fleming, 1973). Prolonged total fasting, as in the case of Irish hunger strikers, results in emaciation. The concomitant vitamin and micronutrient insufficiency causes various physiological disturbances. Finally, clouding of consciousness and death occur (O'Malley, 2001).

Semi-starvation

Semi-starvation results in fluctuating hunger and has powerful effects on the psychological well-being of individuals. Short-term semi-starvation, such as during periods of severe dieting, results in anxiety, depression, sensitivity to food-related cues, and tendency to occasional overeating (Herman et al., 1999; McFarlane et al., 1999; Papies et al., 2007; Polivy & Herman, 2002). Similarly, long-term semi-starvation, as in the case of the Minnesota experiment, Biosphere 2 project, and anorexia nervosa, strongly influences the behavior of individuals. They also become food-focused with a concomitant reduction of concern for other issues (e.g., intellectual interests, sexuality). This preoccupation results in thinking and dreaming about food, and sometimes even shifting career goals to pursue a food-related occupation. Because of the difficulty of resisting constant hunger, they occasionally binge-eat. They develop unusual eating habits and liking for strong tastes and strange food mixtures. They prefer eating-intensive foods, and chew food substitutes to decrease their hunger. Similarly to people subjected to short-term restriction, they are depressed, irritable, and easily distractible (Alling et al., 1993; Brozek, 1950; Keys et al., 1950; Tucker, 2006).

Intermittent Fasting

Intermittent fasting has been studied in several contexts, including the observance of Ramadan, the study of CRL, and experimental research. This kind of fasting results in fatigue, hunger, preoccupation with food and eating, irritability, distractibility, and
tendency to binge-eat. Physical symptoms include headaches, drowsiness, and lack of energy (Finch et al., 1998; Heilbronn et al., 2005; Laessle et al., 1996; Roky et al., 2005; Toda & Morimoto, 2004; Waterhouse et al., 2008).

**Research on Tibetan Buddhists**

This study obtained information from Tibetan Buddhists who participated in the fasting practice of Nyungne and, therefore, have some experience with hunger. As noted in the descriptions of Nyungne, the practice involves intermittent fasting and thus may be expected to result in effects parallel to those observed in intermittent fasting, and short- or long-term restriction. One of the goals of this pilot study was to investigate how the experience of Buddhists is similar or different to the experiences of other restricting people that have been described in the literature.
Chapter 5. Purpose

Specific goals of this exploratory study include:

1. To investigate the subjective experience of food restriction (influence of food restriction on psychological well-being, bodily symptoms of food restriction, localization of hunger in the body) among Tibetan Buddhists monks/nuns and, additionally, American lay Tibetan Buddhists, who participated in the fasting practice of Nyungne.

2. To investigate the mechanisms for coping with hunger in Tibetan Buddhists monks/nuns and, additionally, American lay Tibetan Buddhists (reducing hunger, reframing restriction, distraction from hunger, importance of restriction, environmental support, spiritual practices, acceptance of one’s situation, calming of mind by non-spiritual means).

3. To compare the experience of food restriction and the mechanisms for coping with hunger between Tibetan and American Buddhists.

4. To compare the experience of food restriction between male and female Nyungne participants.
Chapter 6. Methods

Participants and Recruitment

The opportunity to perform the study arose when Venerable Lama Dudjom Dorjee Rinpoche offered the investigator (who also practices Buddhism) the chance to accompany him during his pilgrimage to India in 2008. Because this opportunity was unique and time-limited, the investigator needed to prepare questionnaires and collect data before it was possible to present a thesis proposal to all committee members in the Department of Psychology at University of Hawaii at Manoa. The initial intent was to collect the data during Rinpoche’s pilgrimage to Tibet, China. Unfortunately, due to the political turmoil in the area that started in Spring 2008, Rinpoche decided to make a pilgrimage to India instead. The data were collected during visits in several monasteries in Rewalsar, Himachal Pradesh, India in June of 2008.

In Tibetan Buddhism, monks and nuns stay in monasteries or engage in solitary retreats, and spend much of their time on spiritual practices. Usually, they confine their non-religious activities to working directly for their monastery (e.g., cooking, cleaning). In contrast to most Christian faiths, lifetime vows are not universally expected of Buddhist monastics. It is possible for them to resign from the vows and to begin the life of a lay person.

The samples used in this study were obtained through snowball sampling, which is a form of non-random sampling (Minke & Haynes, 2003). All the subjects agreed to participate after being informed by Rinpoche about this research. After giving the questionnaire guidelines to monks and nuns, Rinpoche described the purpose of the study, explained the response format, and asked participants to read the measures to make sure that all the questions and response options were clear to them. After this introduction, participants began filling in the questionnaire in the presence of Rinpoche, who offered to provide any additional explanations that might be required during the completion of the measures. Sometimes, when asked for clarification, Rinpoche would view the page of the questionnaire where a participant was pointing at a problematic question. For this reason, even though the questionnaires were anonymous, and the participants were complete strangers to Rinpoche, the involvement and proximity of this important religious figure may have affected the way Tibetans answered the questions.
(e.g., increased concern for providing responses consonant with religious beliefs). The involvement of a high religious figure, even though essential to the conduct of this study, may also have given rise to other potential problems. This and other possible threats to the validity and generalizability of the data are discussed in Chapter 8.

Because these measures were the first questionnaires most of the participants had ever taken, answering the questions took them much longer than had been expected. Typically, those who completed the questionnaire in one sitting required 1.5 to 2 hours. In many cases, participants requested additional time to finish the measure, turning in material the following day. Those who did so were informed that they could ask Rinpoche for any clarification of the questions when returning the measures.

After completing the questionnaire, each of the participants was offered a kata, a silk scarf which in Tibetan culture symbolizes pure intentions. The researcher also made small monetary offerings to the participants’ monasteries.

The sample of American lay practitioners consisted of 26 devotees from a Tibetan Buddhist center in Dallas, Texas. They volunteered to participate after being informed about the study by the center’s resident lama, Venerable Lama Dudjom Dorjee Rinpoche. In August 2008, Lama Dorjee Rinpoche administered the questionnaires to the participants and sent the completed measures to the investigator.

All the subjects who volunteered to take part in the study had practiced Nyungne. None of them was participating in Nyungne at the time of taking part in the research.

**Procedures and Measures**

Numerous psychological instruments have been developed to assess variables related to food and eating. Some of them examine aspects of eating behavior [e.g., Eating Disorder Examination (Cooper & Fairburn, 1987); Eating Self-Efficacy Scale (Glynn & Ruderman, 1986)], some of dieting [e.g., Restraint Scale (Herman, 1978); Dietary Inventory of Eating Temptations (Schlundt & Zimering, 1988)], some of eating disorders symptomatology [e.g., Eating Disorder Inventory-2 (Garner 1991); Readiness and Motivation Interview (Geller & Drab, 1999); Pros and Cons of Anorexia Nervosa (Serpell, Teasdale, Troop, & Treasure, 2004)], and some aspects of all three of those domains [e.g., Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairburn, 1987)]. Few instruments are designed to study fasting or semi-starvation specifically [e.g., Semi-
starvation-Associated Behaviors Scale (Hagan, Whitworth, & Moss, 1999); Hunger-Satiety Scale (Garfinkel, 1974)] – and even those are mostly designed to look at these issues in the context of eating disorders. Surprisingly little is available for the purpose of studying techniques people use to restrict caloric intake and/or to cope with the experience of hunger (apart from a curiously narrow focus on behavioral tactics such as exercise or self-weighing). Among the published measures with established psychometric properties, there are no suitable instruments available for the specific questions of interest in the research on Tibetan Buddhists. For this reason, the data were collected by means of a self-report questionnaire constructed by the investigator. As the data collection opportunity limited the time available for questionnaire development and refinement, this study was construed as a pilot exploratory work on the targeted populations. The steps in constructing the measure included (adapted from Haynes, Richard, & Kubany, 1995):

1. Selection of the constructs of particular interest in this research (experience of hunger, mechanisms for coping with hunger) and their dimensions
2. Selection of an assessment method – self report questionnaire
3. Generation of questionnaire items. This included rational deduction, clinical experience, review of the literature relevant to the constructs, and suggestions from experts (Dr. Kelly Vitousek and Lama D. Dorjee)
4. Revision of items in terms of their structure, form and content. During this process, multiple rounds of feedback were obtained from Dr. Kelly Vitousek, Dr. Janet Latner, and graduate students working in the Eating Disorders Program, Department of Psychology at UH Manoa
5. Establishing response formats and scales
6. Formulation of instructions for participants
7. Review of the corrected questionnaire by Dr. Kelly Vitousek, Lama D. Dorjee, and graduate students working in the Eating Disorders Program.
8. Translation of the final form of the questionnaire into Tibetan by Lama D. Dorjee (for the Tibetan Buddhist monks/nuns group). Back-translation of the Tibetan version of the questionnaire into English by a different translator is a crucial additional step. Unfortunately, because of the time constraints in the data
collection opportunity, it was impossible to accomplish this requirement before conducting the study. It remains important to undertake back-translation subsequent to data collection as a cross-check on the accuracy of the primary translation even though it is not possible to collect the data at this time with the reversed-translation questionnaire.

By following the steps outlined above, the investigator attempted to increase content validity of the questionnaire. Because of the language and cultural barriers and limited time available for the refinement of the measure, however, it was not possible to maximize content validity prior to data collection.

The questionnaire consists of three parts; for details, see Appendix B and D. Part One includes items related to subjects’ opinions about the practice of Nyungne and Nyungne-related hunger. Part Two contains constructs related to the subjective experience of food restriction (influence of food restriction on psychological well-being, bodily symptoms of food restriction, localization of hunger in the body). Part Three comprises constructs and groups of items related to various mechanisms for coping with hunger [reducing hunger, reframing restriction, distraction from hunger, importance of restriction, environmental support, spiritual practices, acceptance of your situation (restriction and hunger-related feelings), calming of mind by non-spiritual means].

Before creating the questionnaire, the investigator reviewed the literature on the effects of hunger on the body and the psychological functioning of people subjected to fasting or semi-starvation, and the means people use to cope with prolonged hunger. Information on the meaning, importance and ritual of the practice of Nyungne was also reviewed. This background material guided decisions about which constructs and mechanisms for coping with hunger should be included in the questionnaire, and what domains should be included in each of them. The final version of the questionnaire consists of domains that were expected to be understandable and acceptable for both Tibetan Buddhist clergy and Westerners (even though the latter may not use some of the coping mechanisms, e.g. some spiritual techniques).

All the constructs were assessed by at least 3 items. The only exception was the construct “localization of hunger in the body” which was represented by a single item. This construct was intended to be an extra one because of the reported correlation
between food deprivation and the area of the body where a person feels hungry (Friedman, Ulrich, & Mattes, 1999). A previous study found that the area of the body associated with sensations of hunger increased as a result of fasting and decreased following refeeding. Even though the size of the hunger-affected area did not necessarily correlate with hunger severity measured by standard scales, this body area may provide additional qualitative and quantitative data on the subjective experience of hunger (Friedman et al., 1999).

The investigator tried to avoid creating items about possible coping mechanisms that would certainly be unacceptable for Buddhist clergy (e.g., focusing on sex). Nonetheless, a few coping tactics were included that, at least theoretically, should be rejected by monks and nuns because they are, from the Buddhist perspective, examples of behaviors that result in suffering (e.g., smoking cigarettes or perceiving oneself as superior to people who do not fast). The answers to these particular items can be interpreted in several ways (for a discussion of this issue, see Chapter 8).

The investigator tried to decrease the defensiveness of the subjects by stressing in the questionnaire guidelines that the research was intended to gather honest and real experience. The subjects were encouraged to be open and not to give answers that they might believe they should give (e.g. because of what is expected from practitioners).

**IRB Considerations**

To ensure that the study was ethical, it was carried out after approval by the human subject review board of the University of Hawaii at Manoa (CHS #15976 – “The Experience of Hunger Study”).

The questionnaires were anonymous and did not collect any information that could result in identifying the study participants. All Tibetan study participants were complete strangers to both the investigator and Lama Dorjee.

The investigator tried to forestall any belief that participation was expected or required by clearly stating in the guidelines that completing measures was wholly voluntary. For details, see Appendix A and C.
Chapter 7. Results

General Characteristics of the Samples

Out of 115 questionnaires administered to Tibetan clergy, 100 were filled in completely, and only those participants were included in data analysis. The remaining 15 questionnaires contained large numbers of unanswered questions and, for this reason, were not useful for research purposes. The group included in data analysis consisted of 38 monks and 62 nuns, with a mean age of 39.4 years. On average, they had been clergy for 21.6 years. The mean number of Nyungne practices in which they had participated during the previous year was 22.3, and the mean largest number of consecutive Nyungne practices was 29.0. Because of the high annual frequency of Nyungne practices for this population, monks and nuns were not asked to estimate their cumulative lifetime number, as it was assumed that it would be difficult for them to provide specific information.

The American Buddhist group consisted of 13 men and 13 women, with a mean age of 42 years. On average, they had been Buddhists for 8.1 years. The mean number of Nyungne practices in which they had participated during the previous year was 2, and the mean largest number of consecutive Nyungne practices was 2.6. The mean lifetime number of Nyungne retreats for this sample was 10.3.

Statistical Analysis of the Data

The statistical analysis was performed with SAS version 9.1.3, using (proc) glm, ttest, and factor procedures. Descriptive statistics results were obtained using Excel.

The statistical analysis was done using the two-way ANOVA with the level of significance set at 0.05 for each test. Whenever the analysis revealed significant interaction between nationality and gender (i.e., between Tibetan monks and Tibetan nuns, and/or American men and American women), subsequent t-tests, with the level of significance set at $0.05/2 = 0.025$ (with the Bonferroni correction employed), were performed to compare the effect of nationality for each gender separately (that is, to examine the simple effects of nationality). In other words, the t-test comparisons between Tibetans and Americans were done separately on men and on women. The folded F method was employed to determine which t-test method should be used. With a significant p-value of the folded F method ($p < 0.05$), the Satterthwaite method was used.
With a non-significant p-value of the folded F method, the t-test with the pooled variance was used (Steel & Torrie, 1980). For statistical tables, see Appendix F.

In addition, for some items, histograms were used to help illustrate the nature of the effects of nationality.

**Part 1 of the Questionnaire – Subjects’ Opinions about the Practice of Nyungne and Nyungne-Related Hunger**

The two-way ANOVA did not reveal any significant interactions between nationality and gender in the items included in Part 1 of the questionnaire. Therefore, for these items, the main effects of nationality and gender were examined.

On a five-point scale from 1 (not at all important) to 5 (extremely important), the mean score for the Tibetan group for the importance of Nyungne practice (Question 6) was 1.33. This is a significantly lower score than the mean for the American group (mean 4.46; F(1, 122) = 311.44, p < .001).

Tibetans, for whom the practice is less important, also seem to experience Nyungne-related hunger in a more negative way than Americans. On a five-point scale from 1 (very positive) to 5 (very negative), the mean score for Tibetan group for the feeling of hunger during Nyungne (Question 8) was 3.23. This is significantly higher than the mean score for Americans (mean 2.38; F(1, 122) = 10.92, p = 0.001).

For Tibetans, the mean score for the experience of food restriction during Nyungne (Question 9; response scale like in Question 8) was 2.06, a value that was not significantly different from the mean for the American group (mean 2.23; F(1, 122) = 0.53, p = 0.492).

Tibetans also seem to have harder time than Americans with tolerating practice-related food restriction. On a five-point scale from 1 (easy) to 5 (extremely difficult), the mean score for Tibetan group for tolerating the feeling of hunger during Nyungne (Question 10) was 1.91, which was not significantly different from the mean for the American group (mean 1.85; F(1, 122) = 0.03, p = 0.874). The mean score for Tibetans for tolerating food restriction during Nyungne (Question 11) was 2.06, however, which was significantly higher than the mean score for Americans (mean 1.58; F(1, 122) = 4.53, p = 0.035). This finding is consistent with the ratings of hunger during the practice. On a five-point scale from 1 (I do not experience any hunger) to 5 (very severe hunger), the
mean score for Tibetans for the usual feeling of hunger experienced during Nyungne (Question 12) is 2.52. This value is significantly higher than the mean for the American group (mean 1.92; F(1, 122) = 13.69, p < 0.001).

The above finding is confirmed by comparisons of Tibetans’ and Americans’ opinions about the influence of food restriction on the difficulty of practice, tolerability of Nyungne hunger, the experience of restricting food during the practice after participating in more Nyungne retreats, and the degree of being concentrated on food and eating immediately after finishing Nyungne practice. On a five-point scale from 1 (the practice would be much easier) to 5 (the practice would be more difficult), participants indicated how they believed that the Nyungne experience would change if food restriction were not a part of the practice (Question 13). The mean score for the Tibetan group is 2.02 – significantly lower than the mean value for Americans (mean 2.42; F(1, 122) = 4.71, p = 0.032). On a five-point scale from 1 (the Nyungne hunger is much easier to tolerate) to 5 (the Nyungne hunger is much more difficult to tolerate), participants rated the difference between Nyungne hunger and hunger experienced under normal circumstances (Question 14). The mean score for the Tibetan group for is 2.37, which is significantly higher than the mean value for the American group (mean 1.46; F(1, 122) = 15.69, p < 0.001). On a five-point scale from 1 (much easier) to 5 (much more difficult), participants described the experience of restricting food during the practice after participating in more Nyungne retreats (question 15). The mean score for the Tibetan group is 2.45, and the mean score for the American group is significantly lower (mean 2.00; F(1, 122) = 5.38, p = 0.022). Finally, on a five-point scale from 1 (right after Nyungne, I am much more concentrated on food and eating) to 5 (right after Nyungne, I am much less concentrated on food and eating), participants rated the experience of food immediately after finishing Nyungne practice (Question 16). The mean score for the Tibetan group is 1.94, which is significantly lower than the mean score for Americans (mean 2.58; F(1, 122) = 8.14, p = 0.005).

In Question 7, the participants were asked to mark the three most important things about Nyungne practice (Fig. 1). For Tibetans, the three most important elements of Nyungne were meditation, taking the vows, and generating Bodhicitta (the attitude of love and compassion towards all sentient beings), while for Americans the top-ranked
elements were prayers, chanting mantras, and generating Bodhicitta. In both groups, fasting was one of the three most important Nyungne elements for about one-third of participants.

Figure 1. Three most important things about Nyungne practice. Comparison of the Tibetan group and the American group.

In sum, Nyungne practice is much less important to Tibetans than to Americans. Monks and nuns find the experience of Nyungne-related hunger more negative than Americans, and they have a harder time with tolerating practice-related food restriction. They also ascribe, because of food restriction, more difficulty to the practice. Moreover, in comparison with Americans, for Tibetans Nyungne hunger is harder to tolerate than regular hunger, and the experience of restricting food during the practice after participating in more Nyungne retreats is also more difficult. Apart from this, immediately after finishing Nyungne, Tibetans are more concentrated on food and eating than Americans. Generating Bodhicitta is the most important element of Nyungne for both groups. For Tibetans, the second and third most important elements of the practice are taking the vows and meditation, while for Americans – chanting mantras and saying prayers.
Part 2 of the Questionnaire – Constructs Related to the Subjective Experience of Food restriction.

All the questions included in Construct 1 and Construct 2 were answered using a five-point scale from 1 (not at all true for me) to 5 (extremely true for me). For detailed composition of constructs and groups of items, see Appendix E.

Construct 1 – Influence of Food Restriction on Psychological Well-Being. This construct included items on anxiety, sadness, irritation, and self-focus.

There was no significant interaction between nationality and gender. The findings suggest that monks and nuns experience moderate negative psychological symptoms resulting from food restriction. Their reported symptoms, however, seem to be more intense than those experienced by American lay Buddhists. The mean Construct 1 score for the Tibetan group was 1.92, which was significantly higher than the mean score for the American group (mean 1.58; F(1, 122) = 11.02, p = 0.001).

In the Tibetan group, the most pronounced self-reported symptoms resulting from food restriction were concentrating on oneself (Question 24, mean 3.37) and anxiety (Question 19, mean 2.35), finding it hard “to think about anything but food and eating” (Question 17, mean 2.10), and preferring to be alone (Question 20, mean 1.98). The least pronounced symptoms were: perceiving the world as a hostile place (Question 22, mean 1.27), feeling of sadness (Question 21, mean 1.28), getting upset around people who are eating (Question 23, mean 1.40), and irritation (Question 18, mean 1.61).

In the American group, the most pronounced self-reported symptoms resulting from food restriction were concentrating on oneself (Question 24, mean 1.92), irritability (Question 18, mean 1.88), finding it hard “to think about anything but food and eating” (Question 17, mean 1.69), and preferring to be alone (Question 20, mean 1.69). The least pronounced symptoms included: perceiving the world as a hostile place (Question 22, mean 1.23), feeling of sadness (Question 21, mean 1.35), getting upset around people who are eating (Question 23, mean 1.38), and anxiety (Question 19, mean 1.46).

Construct 2 – Bodily Symptoms of Food Restriction. This construct consisted of items related to negative physical symptoms observed in people subjected to food restriction (weakness, drowsiness, headaches, dizziness, sensitivity to cold, and insomnia). The findings suggest that there are no differences between Tibetans’ and
Americans’ self-report, and the two groups experience moderate physical symptoms of food restriction. The mean Construct 2 score for the Tibetan group is 1.81, and this value is not significantly different from the mean score for the American group (mean 2.09; F(1, 122) = 0.96, p = 0.329). No significant interaction was obtained between nationality and gender.

In the Tibetan group, the most pronounced self-reported symptoms resulting from food restriction were tiredness (Question 31, mean 4.53; reverse scoring), trouble falling asleep (Question 30, mean 2.25), and feeling weak (Question 21, mean 2.21). The least pronounced symptoms were dizziness (Question 28, mean 1.60), headache (Question 27, mean 1.62), and sensitivity to cold (Question 29, mean 1.73).

In the American group, the most pronounced self-reported symptoms resulting from food restriction were tiredness (Question 31, mean 3.88; reverse scoring), weakness (Question 25, mean 2.42), drowsiness (Question 26, mean 2.15), dizziness (Question 28, mean 2.15), and headaches (Question 27, mean 2.12). The least pronounced symptoms were sensitivity to cold (Question 29, 1.73), and trouble falling asleep (Question 30, mean 1.92).

Even though the construct means were not significantly different, there was a difference between the groups in the pattern of answers to Question 26 (When I am restricting food intake, I get drowsy more easily.) The percentage of Tibetans for whom the statement was not true at all was more than twice as large as the percentage of Americans who choose the same answer (Fig. 2).
Figure 2. Pattern of responses of Tibetan and American participants to Question 26 (“When I am restricting food intake, I get drowsy more easily”).

Construct 3 – Localization of Hunger in the Body. In Question 32, subjects were asked to circle all the parts of their body in which their feelings of hunger were localized (Fig. 3). Instead of choosing a body part, they could choose among two additional answers: “hunger is experienced by my mind only and cannot be localized in the body”, and “I do not feel any hunger at all.”

On average, those Tibetans who did not choose any of the two additional answers marked 1.1 body parts while Americans – 2.1 body parts. Half of the Tibetan group did not mark any body part (19% chose “mind” as an answer, and 31% claimed they did not feel any hunger), while only 20% of Americans choose these answers (8% chose the “mind” answer, and 12% reported feeling no hunger at all).

The body parts most frequently marked by Tibetans were chest and upper abdomen, while Americans most frequently marked lower abdomen (circled by none of the Tibetans), upper abdomen, and the head.
Figure 3. Localization of hunger in the body during restricting food intake. Comparison of Tibetans and Americans.

Part 3 of the Questionnaire – Constructs and Groups of Items Related to Various Mechanisms for Coping with Hunger.

All the questions included in Part 3 were answered using a five-point scale from 1 (not at all helpful) to 5 (extremely helpful). For detailed composition of constructs and groups of items, see Appendix E.

Group 1 – Reducing Hunger. This group consisted of items related to different behavioral techniques which may be helpful in reducing the feeling of hunger (finding foods unappealing, smoking cigarettes, being sick, using medication).

There were no significant differences between the answers of Tibetans and Americans, and no significant interaction between nationality and gender was detected.

According to the Tibetan group, the most helpful ways of reducing hunger were having “a slight illness that would take away my hunger” (Question 35, mean 1.73; mean for American group – 1.23; F(1, 122) = 2.81, p = 0.0096), and taking “some medicines to suppress hunger” (Question 36, mean 1.49; the mean for American group – 1.12; F(1, 122) = 3.06, p = 0.083). The least helpful ways of reducing hunger were to start “smoking cigarettes to reduce my hunger” (Question 34, mean 1.32; mean for American group – 1.19; F(1, 122) = 0.36, p = 0.548) and “to train myself to find foods unappealing
(e.g., to start to think that they are too sweet, too greasy)” (Question 33, mean 1.35; mean for American group – 1.31; \(F(1, 122) = 0.04, p = 0.846\)).

**Group 2 – Reframing Restriction.** This group consisted of a three-item Construct 4 and several related items. No significant interaction between nationality and gender was detected in Construct 4 and other items belonging to Group 2.

Construct 4 consisted of items relating to perceiving oneself as stronger and superior to people who do not restrict. The Construct-4 mean for the Tibetan group was 2.22, which was significantly higher than the mean for the American group (mean 1.08; \(F(1, 122) = 69.99, p = <.001\)).

Other questions included in Group 2 were related to different ways of reframing restriction and feeling of hunger (e.g., perceiving hunger as a sign of success, feeling proud, finding pleasure in hunger, thinking of the act of eating as something bad, etc.).

For the Tibetan group, the least helpful technique was “to feel proud of myself for being able to restrict food intake” (Question 41; mean 1.36; mean for American group – 1.69). It was the only question in Group 2 for which there was no significant difference between the groups (\(F(1, 122) = 2.90, p = 0.091\)). For all other questions, Tibetans scored significantly higher than Americans.

Other techniques that were rarely endorsed by Tibetans regarded “punishing myself in some way any time I stop restricting food” (Question 52; mean 1.71; mean for Americans 1.04; \(F(1, 122) = 9.61, p = 0.002\)), and “thinking of hunger as an enemy I must fight with and overcome” (Question 43; mean 2.58; mean for Americans 1.19; \(F(1, 122) = 17.93, p <.001\)).

Tibetans identified the following techniques as more useful for coping with hunger:

- “to train myself to perceive hunger as a sign of success” (Question 37; mean 3.50; mean for Americans 1.65; \(F(1, 122) = 48.97, p <.001\)),

- “to teach myself to find pleasure in the feeling of hunger” (Question 38; mean 3.39; mean for Americans 1.65; \(F(1, 122) = 28.70, p <.001\)),

- and “to think of the act of eating as something bad” (Question 44; mean 3.02; mean for Americans 1.19; \(F(1, 122) = 36.31, p <.001\)).
Group 3 – Distraction from Hunger. This group contained items related to different behavioral techniques aimed at distracting from hunger (physical activity, sleeping more, not dwelling on food-related thoughts).

According to Tibetans, the most helpful techniques from this group were “to spend more time sleeping” (Question 47; mean 2.07; mean for American group – 2.35; F(1, 122) = 1.24, p = 0.267), and “to engage in physical activity (e.g., exercise) to avoid concentration on hunger and food” (Question 45; mean 1.87; mean for American group – 1.58; F(1, 122) = 0.83, p = 0.345). The means for the Tibetan group were not significantly different from the means for Americans.

The least helpful techniques, according to Tibetans, were “not to dwell on thoughts about food and eating” (Question 48; mean 1.39), and “to keep my mind distracted from hunger and food (e.g., by talking to people, reading books)” (Question 46; mean 1.53). In Question 46, the Tibetan mean was significantly lower than the mean score of the American group (mean 2.58; F(1, 122) = 19.39, p < .001).

As two-way ANOVA detected significant trend between nationality and gender for Question 48, the analysis of this item was performed using t-tests (mean for Tibetans – 1.39; mean for Americans – 3.31). The t-tests revealed that there was a significant difference between Tibetan monks and American men (means 2.76 vs. 1.85, t(49) = -3.26, p = 0.002), and also between Tibetan nuns and American women (means 1.40 vs. 3.77, t(14.3) = 5.32, p < 0.001). No significant differences were detected between Tibetan monks and nuns (means 1.37 vs. 1.40, t(98) = -0.16, p = 0.870), or between American men and women (means 2.85 vs. 3.77, t(24) = -1.63, p = 0.116).

Group 4 – Importance of Restriction. This group consisted of items belonging to Construct 5 and related to increasing the importance of restriction for oneself. The mean score for Tibetans was 2.65, and 2.13 for Americans. Two-way ANOVA detected significant interaction between nationality and gender, and t-tests indicated that the difference between Tibetans and Americans was significant when comparing men (means 2.76 vs. 1.85, t(49) = -3.26, p = 0.002), and non-significant when comparing Tibetan and American women (means 2.58 vs. 2.41, t(73) = -0.67, p = 0.508). There were no significant differences between Tibetan monks and nuns (means 2.76 vs. 2.58, t(98) =
1.06, p = 0.294), or between American men and women (means 1.85 vs. 2.41, t(24) = -1.98, p = 0.059).

**Group 5 – Environmental Support.** This group contained items related to different ways of getting support from other people during food restriction. According to Tibetans, the least useful technique from this group was “to ask my family and friends to give me support and encouragement” (Question 54; mean 1.86). There were no significant differences between Tibetan and American groups (mean 2.31; F(1, 122) = 2.27, p = 0.134).

In the case of the remaining questions from Group 5, a two-way ANOVA detected significant interaction between nationality and gender. Therefore, t-tests were performed to determine whether a significant difference existed between the two nationality groups within each gender, and also between men and women within each group of nationality.

The item in Group 5 most endorsed by Tibetans was Question 53, which concerned “restricting with a group of other people who were also restricting to get support from them.” The mean for the Tibetan group was 2.33, and 3.04 for the American group. A subsequent t-test did not find any significant difference between Tibetan and American men (means 2.21 vs. 2.31, t(49) = 0.25, p = 0.805), but the result was significant when Tibetan and American women were compared (means 2.40 vs. 3.77, t(73) = 3.34, p = 0.001). There was no significant difference between Tibetan men and women (means 2.21 vs. 2.40, t(98) = -0.70, p = 0.486), but there was a significant difference between American men (mean 2.31) and women (mean 3.77; t(24) = -3.39, p = 0.002).

In Group 5, the item that was endorsed at second highest frequency by Tibetans was Question 56, which concerned asking “people who live with me not to talk about food and eating in my presence.” The mean for the Tibetan group was 2.22, and 2.04 for the American group. T-tests detected that the difference between Tibetans and Americans was significant when comparing men from both groups (means 2.39 vs. 1.54, t(40.4) = -3.12, p = 0.003), and non-significant when comparing Tibetan and American women (means 2.11 vs. 2.54, t(73) = 1.17, p = 0.245). There were no significant differences between Tibetan men and women (means 2.39 vs. 2.11, t(98) = 1.14, p = 0.257), or between American men and women (means 1.54 vs. 2.54, t(17.6) = -2.43, p = 0.026).
Question 55 concerned asking “people who live with me not to eat in my presence.” The mean for the Tibetan group was 2.15, and 2.23 for the American group. T-tests detected that the difference between Tibetans and Americans was non-significant when comparing men from both groups (means 2.34 vs. 1.69, t(49) = -1.59, p = 0.118), and also non-significant when comparing Tibetan and American women (means 2.03 vs. 2.77, t(73) = 2.04, p = 0.045). Similarly, there was no significant difference between Tibetan men and women (means 2.34 vs. 2.03, t(98) = 1.23, p = 0.222), or between American men and women (means 1.69 vs. 2.77, t(24) = -3.39, p = 0.032).

Group 6 – Spiritual Practices. This group consisted of items belonging to Construct 6, which were related to different spiritual practices aimed at helping with food restriction. The construct 6 mean score for Tibetans was 3.76, and the mean score for Americans was 4.18. These were the highest mean scores obtained from the third part of the questionnaire. Two-way ANOVA detected a significant interaction between nationality and gender. T-tests indicated that the difference between Tibetans and Americans was non-significant when comparing men from both groups (means 3.81 vs. 3.94, t(49) = 0.52, p = 0.605), and significant when comparing Tibetan and American women (means 3.73 vs. 4.43, t(73) = 3.06, p = 0.003). There was no significant difference between Tibetan monks and nuns (means 3.81 vs. 3.73, t(98) = 0.55, p = 0.584), or American men and women (means 3.94 vs. 4.43, t(24) = 1.49, p = 0.150).

Analysis of the patterns of responses revealed some differences between the groups. The pattern of responses to the coping strategy in Question 57 [“To cope with restriction of food intake, it would be helpful to engage in spiritual practice (e.g., pray, meditate)”] is shown in Fig. 4. While the American group clusters at the “extremely helpful” end of the spectrum, the responses of the Tibetans seem to peak at both “extremely” and “moderately helpful.”
Figure 4. Pattern of responses of Tibetan and American participants to Question 57 [“To cope with restriction of food intake, it would be helpful to engage in spiritual practice (e.g., pray, meditate)”].

The pattern of responses to the coping strategy in Question 58 (“To cope with restriction of food intake, it would be helpful to ask Buddha or God for help with resisting hunger”) is shown in Fig. 5. The response pattern by Tibetans seems to be bimodal, with peaks at “moderately” and “extremely helpful”, and the answers by Americans tend to be scattered.
Figure 5. Pattern of responses of Tibetan and American participants to Question 58 (“To cope with restriction of food intake, it would be helpful to ask Buddha or God for help with resisting hunger”).

The pattern of responses to the coping strategy in Question 61 (“To cope with restriction of food intake, it would be helpful to keep in mind that there are people in the world who suffer from hunger more than I do”) is shown in Fig. 6. The answers by Americans cluster at the “extremely helpful” end of the spectrum, while the answers by Tibetans seem to be scattered.
Figure 6. Pattern of responses of Tibetan and American participants to Question 61 (To cope with restriction of food intake, it would be helpful to keep in mind that there are people in the world who suffer from hunger more than I do.)

The pattern of responses to the coping strategy in Question 65 (“To cope with restriction of food intake, it would be helpful to accept the feeling of hunger”) is shown Fig. 7. The answers by Americans seem to cluster towards the “extremely helpful” end, while the answers by Tibetans are more scattered, with a peak in the middle of the spectrum.
Group 7 – Acceptance of your Situation. This group consisted of 2 questions. As a less helpful technique for coping with food restriction, Tibetans found the one presented in Question 68, i.e., perceiving “restricting food and feeling hungry as something humorous” (Tibetan mean 2.29; mean for American group – 2.46). There was no significant difference between the means (F(1, 122) = 0.67, p = 0.414).

Question 67 concerned “not to be angry with myself for thinking about food and hunger”. The mean for the Tibetan group was 3.67 and 3.73 for Americans, and two-way ANOVA detected significant interaction between nationality and gender. T-tests detected that the difference between Tibetans and Americans was non-significant when comparing men from both groups (means 3.74 vs. 2.92, t(49) = -2.06, p = 0.045), and significant when comparing Tibetan and American women (means 3.63 vs. 4.54, t(29.7) = 3.88, p < 0.001). There was no significant difference between Tibetan men and women (means 3.74 vs. 3.63, t(98) = 0.45, p = 0.650), and there was a significant difference between American men and women (means 2.92 vs. 4.54, t(16.8) = 3.67, p = 0.002).

Group 8 – Calming of Mind by Non-Spiritual Means. This group contained items related to being alone, relaxed, and avoiding stressful events. The most endorsed item
from this group concerned staying relaxed (Question 72; mean for Tibetans – 2.89, for Americans – 4.08). As two-way ANOVA detected significant interaction between nationality and gender, a t-test was performed. The t-test indicated that the difference between Tibetans and Americans was non-significant when comparing men from both groups (means 3.18 vs. 3.77, t(49) = 1.41, p = 0.166), and significant when comparing Tibetan and American women (means 2.71 vs. 4.38, t(31.8) = 7.11, p < 0.001). There was no significant difference between Tibetan monks and nuns (means 3.18 vs. 2.71, t(98) = 1.87, p = 0.064) or between American men and women (means 3.77 vs. 4.38, t(17.6) = -1.53, p = 0.145).

Other items in Group 8 were endorsed less frequently by Tibetans. They regarded avoiding stressful life situations (Question 71, mean 2.52; mean for American group – 3.00; F(1, 122) = 3.56, p = 0.061), avoiding being around nervous people (Question 70, mean 2.19; mean for American group – 1.92; F(1, 122) = 0.99, p = 0.321), and spending more time alone (Question 69, mean 1.94; mean for American group – 1.92; F(1, 122) = 0.02, p = 0.879) as coping tactics. There were no significant differences between the means of American and Tibetan groups.

The analysis of the patterns of responses to Question 72 (“To cope with restriction of food intake, it would be helpful to stay relaxed”) revealed some differences between the groups (Fig. 8).
Factor Analysis of Part 3 of the Questionnaire

Factor analysis was used to investigate the correlation structures among items of the third part of the questionnaire that contained constructs and groups of items related to various mechanisms for coping with hunger. For details, see Appendix G. Maximum likelihood method was used as the estimation method. On the basis of the scree plot (see Fig. 9) and the examination of factors, four factors were extracted. The initial solution was further transformed into a simple structure using the promax rotation. The rotated factor pattern (standardized regression coefficients) and inter-factor correlations are given in Tables 49 and 48, respectively.

Factor 1 overlapped mainly with Group 8 (Calming of Mind by Non-Spiritual Means; questions 69-72). Apart from this, it contained items belonging to Group 7 (Question 67), Group 6 (Questions 61, 65, 66), Group 5 (Question 53), Group 4 (Question 50), and Group 2 (Questions 37, 38). For details, see Table 1.

Figure 8. Pattern of responses of Tibetan and American participants to Question 72 (“To cope with restriction of food intake, it would be helpful to stay relaxed”).
GROUP 8.
69. To cope with restriction of food intake, it would be helpful to spend more time alone.
70. To cope with restriction of food intake, it would be helpful to avoid being around nervous people.
71. To cope with restriction of food intake, it would be helpful to avoid stressful life situations.
72. To cope with restriction of food intake, it would be helpful to stay relaxed.

GROUP 7.
67. To cope with restriction of food intake, it would be helpful not to be angry with myself for thinking about food and hunger.

GROUP 6.
61. To cope with restriction of food intake, it would be helpful to keep in mind that there are people in the world who suffer from hunger much more than I do.
65. To cope with restriction of food intake, it would be helpful to accept the feeling of hunger.
66. To cope with restriction of food intake, it would be helpful to accept that it is necessary for me not to eat.

GROUP 5.
53. To cope with restriction of food intake, it would be helpful to be restricting with a group of other people who were also restricting to get support from them.

GROUP 4.
50. To cope with restriction of food intake, it would be helpful to make food restriction the highest priority in my life.

GROUP 2.
37. To cope with restriction of food intake, it would be helpful to train myself to perceive hunger as a sign of success.
38. To cope with restriction of food intake, it would be helpful to teach myself to find pleasure in the feeling of hunger.

Table 1. Questionnaire items overlapping with Factor 1.

Factor 2 overlapped mainly with Construct 6 – Spiritual Practices. It contained 7 out of 10 items belonging to this construct (Questions 57-60, 62, 63, and 65). In addition, this factor contained 3 items not initially assigned to Construct 6 (Questions 40, 44, and 50). For details, see Table 2.
CONSTRUCT 6.
57. To cope with restriction of food intake, it would be helpful to engage in spiritual practice (e.g. pray, meditate).
58. To cope with restriction of food intake, it would be helpful to ask Buddha or God for help with resisting hunger.
59. To cope with restriction of food intake, it would be helpful to dedicate my hunger-related suffering to the benefit of all people.
60. To cope with restriction of food intake, it would be helpful to perceive restriction and my feeling of hunger as opportunities for spiritual development.
62. To cope with restriction of food intake, it would be helpful to concentrate on feelings of love and compassion towards all people.
63. To cope with restriction of food intake, it would be helpful to avoid negative emotions (e.g. anger, jealousy, envy) during the period of food restriction.
65. To cope with restriction of food intake, it would be helpful to accept the feeling of hunger.

CONSTRUCT 4.
40. To cope with restriction of food intake, it would be helpful to look down on people who do not restrict food intake.
GROUP 2.
44. To cope with restriction of food intake, it would be helpful to think of the act of eating as something bad.
GROUP 4.
50. To cope with restriction of food intake, it would be helpful to make food restriction the highest priority in my life.

Table 2. Questionnaire items overlapping with Factor 2.

Factor 3 overlapped with Group 3 (Distraction from Hunger; Questions 45-48), Group 1 (Reducing Hunger; 3 out of 4 questions: 34-36), and Group 4 (Construct 5 – Importance of Restriction; 2 out of 3 questions: 49 and 51). Moreover, it contained 2 items from Group 2 (Questions 41 and 42). For details, see Table 3.
GROUP 3.

45. To cope with restriction of food intake, it would be helpful to engage in physical activity (e.g. exercise) to avoid concentrating on hunger and food.

46. To cope with restriction of food intake, it would be helpful to keep my mind distracted from hunger and food (e.g. by talking to people, reading books).

47. To cope with restriction of food intake, it would be helpful to spend more time sleeping.

48. To cope with restriction of food intake, it would be helpful not to dwell on thoughts about food and eating.

GROUP 1.

34. To cope with restriction of food intake, it would be helpful to start smoking cigarettes to reduce my hunger.

35. To cope with restriction of food intake, it would be helpful to have a slight illness that would take away my hunger.

36. To cope with restriction of food intake, it would be helpful to take some medicines to suppress hunger.

GROUP 4.

49. To cope with restriction of food intake, it would be helpful to remind myself often about the importance of my food restriction.

51. To cope with restriction of food intake, it would be helpful to not to let anything in my life interfere with food restriction.

GROUP 2.

41. To cope with restriction of food intake, it would be helpful to feel proud of myself for being able to restrict food intake.

42. To cope with restriction of food intake, it would be helpful to feel superior to other people because of my ability to stand hunger.

Table 3. *Questionnaire items overlapping with Factor 3.*

Factor 4 contained 2 out of 4 questions forming Group 5 – Environmental Support (Questions 54, 55), and 3 out of 9 items contained in Group 2 – Reframing Restriction (Questions 39, 43, and 52). In addition, it contained one question from Group 1 (Question 33). For details, see Table 4.
GROUP 5.
54. To cope with restriction of food intake, it would be helpful to ask my family and friends to give me support and encouragement.
55. To cope with restriction of food intake, it would be helpful to ask people who live with me not to eat in my presence.

GROUP 2.
39. To cope with restriction of food intake, it would be helpful to envision myself as stronger than people who do not restrict food intake.
43. To cope with restriction of food intake, it would be helpful to think of hunger as an enemy I must fight with and overcome.
52. To cope with restriction of food intake, it would be helpful to punish myself in some way any time I stop restricting food.

GROUP 1.
33. To cope with restriction of food intake, it would be helpful to train myself to find foods unappealing (e.g. to start to think that they are too sweet, too greasy).

Table 4. Questionnaire items overlapping with Factor 4.
Chapter 8. Discussion

This pilot study exploring responses of Tibetan clergy and American lay Buddhists to the fasting practice of Nyungne suggested a number of differences between these populations. As the differences may result from a variety of factors (e.g., disparate cultural backgrounds and familiarity with taking questionnaires), it is not possible to draw confident conclusions about the determinants of these patterns.

The most surprising finding on the first part of the questionnaire was the low importance that the Tibetan monks and nuns ascribed to the practice of Nyungne. Their responses seemed inconsistent with high spiritual importance assigned to this practice by Tibetan Buddhism (Rinpoche, 2004) – a view that appeared to be reflected in the ratings of American lay participants in the present study. There are several possible explanations for this phenomenon. Before the Chinese invasion of Tibet, it was customary for Tibetan children to be sent to monasteries, where they attended school and became “little monks and nuns.” At that time, monasteries and nunneries were the centers of education. After finishing their education, teenagers had the option to disrobe and return to lay society, or to take vows and remain in the monastery. Being a monk or a nun was an esteemed way of life among Tibetans at that time, and it is possible that some people decided to become clergy not because of religious devotion, but because they did not have any other idea about what to do with their lives. It is not clear to what extent the rules and norms of Tibetan society changed in exile in India, but it is possible that some of the monks and nuns who participated in this study chose to become clergy for reasons other than deep spiritual interest. This might help to explain why Tibetan subjects did not find the practice of Nyungne as important as might be expected for a devoted practitioner.

The American participants in this research represent a population different from the Tibetan sample on numerous parameters. They are lay Western people who usually grew up in Christian or Jewish culture and who, because of their spiritual interests, became attracted to Tibetan Buddhism in adulthood and, eventually, decided to convert. In recent decades, Buddhism has become interesting and attractive to many Westerners who are unhappy with Judeo-Christian spiritual systems. The researcher, who practices Buddhism himself, has observed that the subgroups of Westerners who are drawn to Buddhism include many individuals who feel somehow rejected by or alienated from the
mainstream Western society. Informal observations during open meetings with Buddhist masters have yielded a number of illustrating examples. Some individuals may be attracted to Buddhism for non-spiritual reasons, such as the exotic aura of the East or the feeling of community with like-minded souls. Individuals who make a decision to convert to Buddhism, however, are more likely to be influenced by religious devotion, may be inclined to take religious precepts especially seriously. This possibility is supported by observations that religious converts are usually characterized by high levels of religiosity (Bilette, 1967; Mayer & Avgar, 1987). Lay American Buddhists who decide to participate in Nyungne are an even more selected group. These are converts who volunteer, because of their strong devotion, to participate in a long, hard, and physically strenuous religious ritual. For them, Nyungne is a practice full of spiritual meaning in which they dedicate the resulting merit to the benefit of all sentient beings (Rinpoche, 2004). This may explain the very high importance that the American subjects ascribed to the ritual.

Another contributor to the low importance ascribed to Nyungne by Tibetans may be that monks and nuns engage in a large number of different spiritual practices, many of which are also believed to be very powerful. For this reason, Nyungne, may not stand out as especially important to Tibetan clergy.

The situation of American lay Buddhists differs on this dimension as well. They do not have access to many religious practices, and the opportunity to engage in Nyungne is quite rare, as it requires a trained lama to be a leader of the ritual. In part because of its limited availability, Nyungne may be viewed as a very precious practice.

One final factor that may contribute to the large discrepancy between the importance ascribed to Nyungne by lay Americans and Tibetan clergy is the number of practices the participants had engaged in before taking the questionnaire. In the case of Tibetans, the number was much higher than in the case of Americans. It is reasonable to speculate that frequent participation in Nyungne might lead to it being viewed as a more “usual” devotional element, even if the practice itself is believed to be special.

The differences in the importance ascribed to Nyungne by Tibetans and Americans may help to explain their opinions about practice-related hunger and food restriction. Monks and nuns perceive the feeling of hunger during the practice as more negative than
Americans, and their hunger experienced during Nyungne is stronger (close to “moderate hunger”) than the hunger experienced by lay Buddhists (close to “mild hunger”). Their Nyungne-related hunger is also described as being more similar to regular hunger, while the American sample reported that under these circumstances hunger is easier to tolerate than regular hunger. Similarly, tolerating food restriction during Nyungne was described as more difficult for Tibetans, who were more likely than Americans to anticipate that the practice would be easier if food restriction were not required. Right after Nyungne, Tibetan monks and nuns report more concentration on food and eating than do Americans. For clergy who have participated in numerous Nyungne retreats, the experience of food restriction appeared to be more arduous than for lay Buddhists. The findings in the Tibetan group are similar to those of Heilbron et al. (2005), who found that during intermittent fasting participants did not “adapt” to the experimental conditions, at least over the limited period of the test. But contrary to Tibetan participants of this study, and similarly to the American group, Heilbron’s subject had not experienced many years of periodic restriction. For this reason, it is possible that among Americans the perception of hunger and food restriction during Nyungne was significantly influenced by high spiritual importance they ascribed to the practice.

In sum, the pattern of findings obtained in this research may be attributable to a complex combination of factors. More negative opinions about Nyungne-related food restriction might result from the lesser importance that Tibetans ascribed to the practice. The high importance that Americans ascribed to Nyungne may result from their having been influenced to a greater degree by the doctrinal importance of the practice (Rinpoche, 2004). Instead of basing their answers on personal experience, this population of converts may have tended to give answers based on what is expected from practitioners.

The obtained discrepancies between groups might also be a function of another factor in addition to or instead of biased responding. As summarized in the Introduction, hunger is extremely difficult to tolerate over long periods (Brozek, 1950; Keys et al., 1950; Alling et al., 1993; Tucker, 2006). For this reason, the opinions of Tibetans may be linked to their more extensive experience with practice-related food restriction. Because of the high annual frequency of Nyungne practices for this population, monks and nuns were not asked to estimate their cumulative lifetime number, as it was assumed
that it would be difficult for them to provide specific information. The mean number of Nyungne practices they had engaged in during the previous year, however, and the mean highest number of their consecutive practices (both numbers were more than 10 times higher than those for lay Buddhists) clearly show that they have had much more experience with the practice than Americans. Clergy’s greater experience with the practice may explain their more negative opinions about Nyungne-related hunger and food restriction. At the same time, Americans’ more positive answers might simply reflect their more limited experience with food restriction during the practice.

Another explanation of the observed difference could be discrepancy in meditative skills. Meditation, different forms of which are a part of Nyungne (Rinpoche, 2004), can cause shifts in conscious awareness and physiological changes, such as altered brain electroactivity and blood flow (e.g., Benson et al., 1990; Carter et al., 2005; Lehmann et al., 2001; Lutz et al. 2004; Newberg et al., 2001). The researcher did not locate any studies examining the influence of meditative techniques on the perception of hunger. In view of the physiological changes that have been demonstrated to occur during meditation, however, decreased perception of hunger might be present during meditative states. If this is the case, monks’ and nuns’ more negative opinions about hunger and food restriction might reflect poorer meditation during the practice. Perhaps because of the lesser importance these individuals ascribed to Nyungne, they may not apply themselves to the task of meditation as assiduously. Even if meditation does not influence the perception of hunger, emotional attitudes towards food restriction may affect the perception of hunger. High importance ascribed to Nyungne may result in a more positive approach towards food restriction, which, in turn, may decrease the perception of hunger and increase tolerance for food restriction.

In the first part of the questionnaire, the participants were also asked about the three most important things about the practice. The largest percentage in all groups identified Bodhicitta, the feeling of love and compassion towards all sentient beings, as one of the most important elements of the practice. This is not surprising, considering how important Bodhicitta is in Buddhist religion and philosophy (Ray, 2001). What is interesting, though, is the qualitative difference between Tibetans and Americans among the answers about the second and third most important Nyungne elements. The largest
percentage of Tibetans chose taking the vows and meditation, while Americans named chanting mantras and saying prayers. The answers of Tibetans are more state-of-mind-oriented, while the answers of Americans seem to be more “technical,” or ritual-oriented. As in Nyungne the state of mind is most important (Rinpoche, 2004), the answers to this question might reflect deeper spiritual understanding of the practice on behalf of the monks and nuns, despite the lesser importance they ascribe to it.

The second part of the questionnaire concerned participants’ subjective experience of food restriction. Even though the subjects were asked about the experience of food restriction in contexts other than Nyungne, it is probable that food restriction during the practice was the principal hunger-related life event for many participants.

Tibetans reported moderate psychological symptoms during food restriction, which were relatively more intense than those reported by Americans. This is in accordance with participants’ reports in the first part of the questionnaire about the difficulty of food restriction during Nyungne. In both groups, several common symptoms of food restriction were identified as the most pronounced. The most intense was concentrating on oneself, followed by a reported preference for being alone. On the one hand, this may be related to experiencing food restriction during Nyungne – a practice during which one is intended to concentrate on oneself, e.g., by engaging in different forms of meditation, and taking the vows of silence and sexual abstinence (Rinpoche, 2004). It is also possible, however, that the self-focus described is a function of the food restriction itself, as virtually all sources of information report a decrease in social contacts among semi-starving individuals (e.g., Alling et al., 1993; Keys et al, 1950; Tucker, 2006).

Another common and pronounced psychological symptom reported by participants is finding it hard to think about anything but food and eating. As this hypervalent concern is described by all people exposed to dieting, prolonged semi-starvation, intermittent fasting, and anorexia nervosa (e.g., Alling et al., 1993; Beumont et al., 1976; Keys et al, 1950; Laessle et al., 1996; McFarlane et al., 1999; Tucker, 2006), it is not surprising to find it reported in the context of Nyungne.

In addition, Tibetan participants endorsed anxiety as a frequent symptom, while Americans reported feeling irritable. Both of these symptoms are commonly reported in the context of semi-starvation (Brozek, 1950; Helweg-Larsen et al., 1952; Keys et al,
1950; Russell, 2005; Tucker, 2006), eating disorders (Laessle et al., 1988), and dieting (McFarlane et al., 1999; Polivy & Herman, 2002).

In sum, data reveal that both groups experience psychological symptoms of food restriction in a way similar to instances described in literature. Although it is not possible to draw conclusions about the relative strength or prominence of specific symptoms in the absence of data from other groups using the same measures, it appears that there are few qualitative differences between psychological response to Nyungne and other instances of food restriction.

Answers to the questionnaire suggest that the subjects experience moderate physical symptoms of food restriction, without significant differences between groups. Both Tibetans and Americans identified tiredness and weakness as the most pronounced symptoms. Once again, these symptoms are characteristic of many different instances of limited caloric intake (Alling et al., 1993; Keys et al., 1950; Krall, 2000; Laessle et al., 1996; Poynter, 2006). Interestingly, the pattern of answers to Question 26 suggests that Tibetans seem to be less likely than Americans to feel drowsy as a result of food restriction. If this difference is meaningful, its possible explanation may be better behavioral coping resulting from clergy’s greater experience with Nyungne. It seems unlikely, though, that Tibetans’ repeated experience with Nyungne results in some kind of metabolic adaptation which allows them to cope better with food restriction (Tilley, 1990).

The results for Construct 3, localization of hunger in the body, were particularly interesting. Those Tibetans who localized hunger in the body, selected 1.1 body parts on average, while Americans identified 2.1 body parts. This difference might suggest that Tibetans, on average, are less affected by food deprivation than Americans (Friedman et al., 1999). Findings in the first part of the questionnaire, however, suggest the opposite conclusion. Either the body area affected by the feeling of hunger does not provide additional qualitative and quantitative data on the subjective experience of hunger (Friedman et al., 1999), or the technique used in the questionnaire is not appropriate for obtaining reliable information useful for this purpose. The analysis of answers to this question, however, detected some qualitative differences between the groups in identifying the body regions in which their feelings of hunger were localized. Body areas
most endorsed by Tibetans were chest and upper abdomen, while the highest percentage of Americans chose lower abdomen (marked by no Tibetans), upper abdomen, and the head. As physiological differences between the samples are unlikely, it seems probable that the different reports might result from cultural beliefs about localization of hunger.

Those study participants who did not wish to identify any body parts as the locus of hunger could choose one of two additional answers. Almost every fifth Tibetan, compared to one in thirteen Americans, reported that hunger was experienced by his or her mind only and could not be localized in the body. Such answers might reflect one of two possibilities. These individuals may have had difficulty localizing the feeling of hunger in their body; alternatively, they may have given an automatic answer based on Buddhist philosophy, which says that all phenomena are creation of mind (Gyamsto, 2003). Almost one in three Tibetans (and one in eight Americans), instead of marking a body part or mind, declared that they did not feel any hunger at all. Such a phenomenon is possible in some pathological conditions, e.g., in oncologic patients (Hawkins, 2000). In the studied population, however, it seems unlikely. Such answers may result from carelessness while taking the measure or inconsistency in self-report.

The last part of the questionnaire concerned different strategies for coping with hunger. Considering the context of food restriction in this study and the religious dedication of the subjects, it is not surprising that spiritual practices were regarded as most useful. As the difference between groups was significant only when comparing women (higher American mean), it is difficult to make any definite comments about the degree of the discrepancy. Analysis of patterns of answers suggests, however, that Americans find spiritual practices such as prayer or meditation more helpful in coping with food restriction than do Tibetans. This interpretation is consonant with the high importance ascribed by this group to the spiritual practice of Nyungne and, as discussed earlier, may suggest the more serious approach towards religion often taken by converts. Patterns of responses suggest also that Americans place a high value on such religion-consistent techniques as “to keep in mind that there are people in the world who suffer from hunger more than I do” and “to accept the feeling of hunger”. At the same time, Tibetans seem to find it more useful to ask Buddha for help in coping with restriction of food intake. The differences between the groups suggest that Americans may be more
likely to take an active approach towards coping with food restriction, while Tibetans might be more likely to be passive and, instead of relying on themselves, may tend to turn to an outside source of power for support. This discrepancy may reflect cultural differences, as American values encourage active approach towards challenges. Alternatively, the difference between groups might also result from different emotional approaches towards the practice of Nyungne.

In view of the high usefulness ascribed to spiritual practices, it is not surprising that the second and third most useful techniques were those contained in Group 7 (Acceptance of your situation) and Group 8 (Calming of mind by non-spiritual means). Even though the techniques are not religious, they are closely related to Buddhist precepts which put emphasis on acceptance and maintaining a calm state of mind as necessary conditions for spiritual practice and development (Dalai Lama & Hopkins, 2002). Among non-spiritual means of calming of mind, the most endorsed were those consistent with Buddhist philosophy: staying relaxed and avoiding stressful life situations.

Less frequently endorsed techniques for coping with hunger included groups of questions unrelated to spirituality: importance of restriction, environmental support, reframing restriction, distraction from hunger, and reducing hunger. In view of the religious orientation of the populations used in this study, it seems understandable that these groups of questions scored lower than those related to Buddhist philosophy and spirituality. Because the differences in scoring among the groups are not prominent, it would be difficult to hypothesize about their causes. More careful study of the results, however, yields a few interesting observations. For example, among the techniques for environmental support, those identified as most useful reflect the conditions of Nyungne: restricting in a group and avoiding being exposed to food-related cues by other people. This might suggest that either the participants gave their replies while thinking about the context of Nyungne, or that the practice conditions themselves are restriction-friendly and include useful coping strategies.

Another observation is related to the cluster of items on reframing restriction, in which almost all techniques were endorsed as significantly more useful by Tibetans compared to Americans, for whom they were among the least endorsed ones. Many of
the items in this cluster (e.g., perceiving oneself as stronger or superior than people who do not restrict, perceiving hunger as a sign of success, feeling proud for being able to restrict, etc.) are contrary to Buddhist precepts and philosophy. Accordingly, the low endorsement of these coping techniques by American converts could reflect their fidelity to Buddhist teachings. Endorsement of these items by some clergy members could reflect their honesty, or may be a function of carelessness while taking the questionnaire or translation problems.

Even though there are differences between Tibetans and Americans related to the level of importance ascribed to the practice, both groups were least likely to endorse smoking cigarettes as a means of reducing hunger. In the view of very negative opinions about smoking by Tibetan Buddhism, the minimal endorsement of smoking may reflect religious precepts. In addition, the monks and nuns would lack experience with smoking as an appetite-suppressant, as they are not allowed to smoke.

Finally, both groups indicated that being distracted by talking to people or reading books was not a helpful distraction technique. This may result from the fact that this kind of distraction, understood as a lack of focus, is perceived by Buddhism as something negative (Ray, 2001), and certainly undesirable during Nyungne as it interferes with meditation (Rinpoche, 2004).

The results of this preliminary investigation suggest that the populations studied experience food restriction in ways that are at least broadly similar to reports in the literature. Probably because of their strong religious affiliation and the religious context of their food-restriction experiences, they tend to value Buddhism-related techniques for coping with hunger. The differences observed between the Tibetan and American groups might be a function of their different cultural backgrounds, differences in religious devotion, and/or different histories of exposure to restriction. Because of reports of sex differences in response to food restriction (Marsh, 1916; Del Parigi et al., 2002), this study also compared patterns for male and female participants. No significant differences were found between Tibetan monks and nuns; only three questions (all related to the utility of specific coping strategies) differentiated American men and women. Either the questionnaire did not cover the psychological areas of food restriction in which sex differences have been obtained, or the technique used for the study were inappropriate for
investigating this issue. It is also possible that the nature of the practice either does not elicit or masks sex differences reported elsewhere.

A factor-analytic approach was used to investigate the correctness of combining the items into groups and constructs in the Tibetan version of the questionnaire. It was not possible to combine the two groups as the Americans and Tibetans were taking different versions of the questionnaire because of translation and language differences. The American group was in turn too small to qualify for independent factor analysis. A four-factor solution best fit the pattern of responses in terms of the scree plot result and examination of the contents of the factors. Factor 1 overlapped principally with Group 8, Factor 2 with Construct 6, and Factor 3 with Groups 1, 3, and 4, while Factor 4 was partially overlapping with Group 5 and 2. The correlation \( r = 0.305 \) between Factor 1 (overlapping principally with Calming of Mind by Non-Spiritual Means) and Factor 2 (overlapping principally with Spiritual Practices) is understandable as both of them contain items related to Buddhist philosophy. In the case of this study, the lack of a perfect match between the factors and groups/constructs is acceptable. The questionnaire groups/constructs were not established initially on the basis of well-defined constructs, reported in other food-restricted populations, that were assumed to be independent, but were based on rational clusters of phenomena from studying particular populations.

Numerous problems arose during the conduct of the study, some of which could not be overcome. During preparation of the project, time constraints imposed by the unique assessment opportunity conflicted with the optimal sequence of procedures designed to increase the reliability and validity of the questionnaire. While the measure did go through multiple iterations based on feedback from experts and graduate students in the Department of Psychology at the University of Hawaii, it was not possible to include all desirable steps before administering the measure, such as back-translation of the Tibetan version of the questionnaire into English or the collection of pilot data from a sample of the target population. Accordingly, the project should be viewed as pilot exploratory work on the questions examined.

As emphasized earlier, the spiritual importance ascribed to the fasting practice of Nyungne might have influenced the way that the subjects answered the questionnaire items. Participants may have been disposed to present their experience of restriction
during Nyungne in particular ways because of what is expected from practitioners (i.e., they might have tended to repeat what they were supposed to, instead of giving answers derived from their own experience). The investigator attempted to mitigate this problem in the instructions by stressing the importance of providing honest answers based on personal experience only. However, the test results, especially those of American group, may be suggestive of a failure of this instructional set to eliminate biased responding about topics closely related to participants’ spiritual beliefs.

As mentioned in the “Participants and Recruitment” section, there are several problems related to the involvement of a high lama in the research. Even though it was emphasized that participation was optional, it is quite possible that some participants volunteered with the motive of “pleasing” Rinpoche. Moreover, Rinpoche explained study materials before measures were completed, and the monks and nuns filled in the questionnaires (or at least began doing so) in his presence. Sometimes, when asked about clarification, Rinpoche would have a look at the page of the questionnaire where a participant was pointing at a problematic question. For this reason, even though the questionnaires were anonymous and Rinpoche did not know the monks and nuns participating in the study, the involvement and proximity of this important religious figure may have affected the way Tibetans answered the questions.

Another factor influencing the way subjects endorsed questionnaire items may have been cultural differences. It has been already mentioned earlier that some response differences between the groups might be explained by their different cultural backgrounds. For example, it can be expected that acknowledging that an experience is difficult may have a different meaning for Americans than for Tibetan monks and nuns. The degree of familiarity with the questionnaire technique, resulting from growing up in different cultures, may also have influenced the endorsement of questionnaire items. During their education and adult life, Americans take a great number of questionnaires, and completing the measure used in this study was probably nothing unusual for them. At the same time, most of the Tibetan subjects participating in this study had no previous experience with this technique, and, considering the amount of time needed for completing of the questionnaire, found it more difficult to answer the items.
Another problem is related to the phenomenon of hunger. Because hunger is essentially private experience, it is impossible to measure objectively hunger in any respondent, regardless of his or her cultural background or the specific measures chosen. Moreover, it was not possible to obtain precise information on how food-deprived the subjects were while practicing Nyungne. There may have been substantial differences between the individuals and the groups involved in this research. Among others, the differences might have resulted from diverse caloric intake or degree of physical activity (prostrations) during the practice. In addition, some of the techniques used to cope with hunger (e.g., focusing on the importance of restriction) might have influenced perception of the experience, and thus might have distorted self-report. Furthermore, the time elapsed between the last fasting experience and participation in the research might have influenced accuracy of responses.

This study is a pilot exploratory work on the topic of hunger related to a fasting religious practice. Despite the aforementioned problems, studies in this area can contribute to our understanding of human reactions to food restriction. Understanding more about the human experience of hunger can help us better comprehend eating disorders and obesity, and thus may contribute to the development of new and more effective psychological treatment techniques.
Appendix A. The Questionnaire Guidelines Presented to Monks and Nuns who Volunteered to Take Part in the Study

The Experience of Hunger Study

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This study is done by a graduate student who is preparing for a doctoral degree in psychology. The purpose of the project is to understand the experience of people who fast or restrict what they eat for different reasons.

This questionnaire will take about 30 minutes to complete. Participation in this research project is completely voluntary. All monks and nuns who are 18 years old or older, and who participated in Nyungne practice, are welcome to take part in this research.

Data collected will be anonymous. It is important for the people who choose to participate in this study to be as open/honest and accurate as possible in answering these questions. We are trying to understand people’s real experience in these situations, not what they believe they are supposed to experience.

If you have any questions regarding this research project, please contact the researcher, Marcin Bury at (+1) 808 389 5481, email: bury@hawaii.edu.

If you have any questions regarding your rights as a research participant, please contact the University of Hawaii Committee on Human Studies at (+1) 808 956 5007, email: uhirb@hawaii.edu.
Appendix B. The Version of the Questionnaire Administered to Tibetan Buddhist Monks and Nuns

PART 1.

Please, circle the number of the answer that applies most to you.

1. I am:
   1) a monk
   2) a nun

2. I am ____ years old. (fill in)

3. I have been a monk/a nun for ____ years. (fill in)

4. Within the last year, I have participated in Nyungne approximately ____ times. (fill in)

5. The largest number of consecutive Nyungne retreats I participated in is approximately ___. (fill in)

6. How important to you is the Nyungne practice?
   1) not at all important
   2) slightly important
   3) moderately important
   4) very important
   5) extremely important

7. For you as an individual, what are the three most important things about Nyungne practice? (please circle three of the choices below)
   1) fasting
   2) restricting fluid intake
   3) prayers
   4) chanting mantras
   5) doing prostrations
   6) meditation
   7) taking the vows
   8) generating Bodhicitta
8. For me, the feeling of hunger during Nyungne is:
   1) very positive
   2) positive
   3) neutral
   4) negative
   5) very negative

9. For me, the experience of food restriction during Nyungne is:
   1) very positive
   2) positive
   3) neutral
   4) negative
   5) very negative

10. For me, tolerating the feeling of hunger during Nyungne is:
    1) easy
    2) a bit difficult
    3) moderately difficult
    4) very difficult
    5) extremely difficult

11. For me, tolerating food restriction during Nyungne is:
    1) easy
    2) a bit difficult
    3) moderately difficult
    4) very difficult
    5) extremely difficult

12. For me, the feeling of hunger I experience during Nyungne is usually:
    1) absent (I do not experience any hunger)
    1) mild hunger
    3) moderate hunger
    2) severe hunger
    3) very severe hunger

13. According to you, how would the experience of Nyungne change if food restriction were not a part of the practice?
    1) the practice would be much easier
    2) the practice would be a little bit easier
    3) the practice would remain the same
    4) the practice would be a little bit more difficult
    5) the practice would be much more difficult
14. According to you, how different is it to be hungry during Nyungne in comparison to hunger experienced under regular circumstances (such as missing a meal because you are too busy to eat or have no food available)?

1) the Nyungne hunger is much easier to tolerate
2) the Nyungne hunger is a little bit easier to tolerate
3) the Nyungne hunger is the same
4) the Nyungne hunger is a little bit more difficult to tolerate
5) the Nyungne hunger is much more difficult to tolerate

15. As I have participated in more Nyungne retreats, the experience of restricting food during the practice has become:

1) much easier
2) a little bit easier
3) the same
4) a little bit more difficult
5) much more difficult

16. Have you noticed any changes in your experience of food immediately after finishing Nyungne practice?

1) right after Nyungne, I am much more concentrated on food and eating
2) right after Nyungne, I am a little bit more concentrated on food and eating
3) right after Nyungne, I have not noticed any changes in my food experience
4) right after Nyungne, I am a little bit less concentrated on food and eating
5) right after Nyungne, I am much less concentrated on food and eating

PART 2

How much do you think each of the following statements about restricting food intake applies to you? Please circle the number of the answer that applies most to you.

17. When I am restricting food intake, it is hard for me to think about anything but food and eating.
1) Not at all true for me.
2) Slightly true for me.
3) Moderately true for me.
4) Very much true for me.
5) Extremely true for me.

18. When I am restricting food intake, I become irritated more easily.
1) Not at all true for me.
2) Slightly true for me.
3) Moderately true for me.
4) Very much true for me.
5) Extremely true for me.
19. When I am restricting food intake, I feel more anxious.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

20. When I am restricting food intake, I prefer being alone to being with people.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

21. When I am restricting food intake, I more often feel sad.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

22. When I am restricting food intake, the world seems like a hostile place to me.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

23. When I am restricting food intake, I am upset when I am around people who are eating.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

24. When I am restricting food intake, I concentrate more on myself.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.
25. When I am restricting food intake, I feel weaker than usual.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

26. When I am restricting food intake, I get drowsy more easily.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

27. When I am restricting food intake, I am more likely to get headaches.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

28. When I am restricting food intake, I am more likely to get dizzy.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

29. When I am restricting food intake, I am more sensitive to cold.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

30. When I am restricting food intake, I am more likely to have trouble falling asleep.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.
31.  When I am restricting food intake, I feel more energized.
   1) Not at all true for me.
   2) Slightly true for me.
   3) Moderately true for me.
   4) Very much true for me.
   5) Extremely true for me.

32.  Circle all the parts of your body in which your feelings of hunger are localized when you are restricting food intake:
   1) head
   2) neck
   3) chest
   4) upper abdomen
   5) lower abdomen
   6) arms
   7) legs
   8) hunger is experienced by my mind only and cannot be localized in my body
   9) I do not feel hunger at all

**PART 3.**

How helpful do you think each of the following strategies would be for you as an individual in coping with HUNGER during periods of restricted food intake? Please circle the number of the answer that applies most to you.

33.  To cope with restriction of food intake, it would be helpful to train myself to find foods unappealing (e.g. to start to think that they are too sweet, too greasy).
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

34.  To cope with restriction of food intake, it would be helpful to start smoking cigarettes to reduce my hunger.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
35. To cope with restriction of food intake, it would be helpful to have a slight illness that would take away my hunger.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

36. To cope with restriction of food intake, it would be helpful to take some medicines to suppress hunger.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

37. To cope with restriction of food intake, it would be helpful to train myself to perceive hunger as a sign of success.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

38. To cope with restriction of food intake, it would be helpful to teach myself to find pleasure in the feeling of hunger.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

39. To cope with restriction of food intake, it would be helpful to envision myself as stronger than people who do not restrict food intake.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful
40. To cope with restriction of food intake, it would be helpful to look down on people who do not restrict food intake.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

41. To cope with restriction of food intake, it would be helpful to feel proud of myself for being able to restrict food intake.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

42. To cope with restriction of food intake, it would be helpful to feel superior to other people because of my ability to stand hunger.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

43. To cope with restriction of food intake, it would be helpful to think of hunger as an enemy I must fight with and overcome.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

44. To cope with restriction of food intake, it would be helpful to think of the act of eating as something bad.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
45. To cope with restriction of food intake, it would be helpful to engage in physical activity (e.g. exercise) to avoid concentrating on hunger and food.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

46. To cope with restriction of food intake, it would be helpful to keep my mind distracted from hunger and food (e.g. by talking to people, reading books).
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

47. To cope with restriction of food intake, it would be helpful to spend more time sleeping.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

48. To cope with restriction of food intake, it would be helpful not to dwell on thoughts about food and eating.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

49. To cope with restriction of food intake, it would be helpful to remind myself often about the importance of my food restriction.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
50. To cope with restriction of food intake, it would be helpful to make food restriction the highest priority in my life.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

51. To cope with restriction of food intake, it would be helpful to not let anything in my life interfere with food restriction.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

52. To cope with restriction of food intake, it would be helpful to punish myself in some way any time I stop restricting food.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

53. To cope with restriction of food intake, it would be helpful to be restricting with a group of other people who were also restricting to get support from them.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

54. To cope with restriction of food intake, it would be helpful to ask my family and friends to give me support and encouragement.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
55. To cope with restriction of food intake, it would be helpful to ask people who live with me not to eat in my presence.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

56. To cope with restriction of food intake, it would be helpful to ask people who live with me not to talk about food and eating in my presence.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

57. To cope with restriction of food intake, it would be helpful to engage in spiritual practice (e.g. pray, meditate).
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

58. To cope with restriction of food intake, it would be helpful to ask Buddha or God for help with resisting hunger.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful

59. To cope with restriction of food intake, it would be helpful to dedicate my hunger-related suffering to the benefit of all people.
1) Not at all helpful
2) A little bit helpful
3) Moderately helpful
4) Very helpful
5) Extremely helpful
60. To cope with restriction of food intake, it would be helpful to perceive restriction and my feeling of hunger as opportunities for spiritual development.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

61. To cope with restriction of food intake, it would be helpful to keep in mind that there are people in the world who suffer from hunger much more than I do.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

62. To cope with restriction of food intake, it would be helpful to concentrate on feelings of love and compassion towards all people.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

63. To cope with restriction of food intake, it would be helpful to avoid negative emotions (e.g. anger, jealousy, envy) during the period of food restriction.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

64. To cope with restriction of food intake, it would be helpful to perceive the feeling of hunger as a reminder of the unavoidable suffering of human existence.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
65. To cope with restriction of food intake, it would be helpful to accept the feeling of hunger.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

66. To cope with restriction of food intake, it would be helpful to accept that it is necessary for me not to eat.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

67. To cope with restriction of food intake, it would be helpful not to be angry with myself for thinking about food and hunger.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

68. To cope with restriction of food intake, it would be helpful to perceive restricting food and feeling hungry as something humorous.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

69. To cope with restriction of food intake, it would be helpful to spend more time alone.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
70. To cope with restriction of food intake, it would be helpful to avoid being around nervous people.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

71. To cope with restriction of food intake, it would be helpful to avoid stressful life situations.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful

72. To cope with restriction of food intake, it would be helpful to stay relaxed.
   1) Not at all helpful
   2) A little bit helpful
   3) Moderately helpful
   4) Very helpful
   5) Extremely helpful
Appendix C. The Questionnaire Guidelines Presented to American Lay Tibetan Buddhists who Volunteered to Take Part in the Study

The Experience of Hunger Study

Marcin Bury
Primary Investigator
(808) 389 5481

This study is done by a graduate student who is preparing for a doctoral degree in psychology. The purpose of the project is to understand the experience of people who fast or restrict what they eat for different reasons.

This questionnaire will take about 30 minutes to complete. Participation in this research project is completely voluntary. All lay Tibetan Buddhists who are 18 years old or older, and who participated in Nyungne practice, are welcome to take part in this research project.

Data collected will be anonymous. It is important for the people who choose to participate in this study to be as open and accurate/honest as possible in answering these questions. We are trying to understand people’s real experience in these situations, not what they believe they are supposed to experience.

If you have any questions regarding this research project, please contact the researcher, Marcin Bury at (808) 389 5481, email: bury@hawaii.edu.

If you have any questions regarding your rights as a research participant, please contact the University of Hawaii Committee on Human Studies at (808) 956 5007, email: uhirb@hawaii.edu.
Appendix D. The Version of the Questionnaire Administered to American Lay Tibetan Buddhists

PART 1.

1. I am a ____ man ____ woman. (please tick)

2. I am ____ years old. (fill in)

3. I have been a Tibetan Buddhist for ____ years. (fill in)

4. Within the last year, I have participated in Nyungne approximately ____ times. (fill in)

5. In my life, I have participated in Nyungne approximately ____ times (fill in)

6. The largest number of consecutive Nyungne retreats I participated in is approximately ___. (fill in)

Please circle the number of the answer that applies most to you.

7. How important to you is the Nyungne practice?
   1) extremely important
   2) very important
   3) moderately important
   4) slightly important
   5) not at all important

From Question #7 (#6 in the questionnaire version for monks and nuns), all the questionnaire items are the same for both groups (lay and clergy Buddhists).

In all the parts of the dissertation, including the appendices, numbers of all the questions mentioned follow the numbers in the Tibetan version of the questionnaire (see Appendix B).
Appendix E. Groups of Questions and Constructs Used in the 2nd and 3rd Part of the Questionnaire

Part 2 of the Questionnaire

All the questions included in Construct 1 and Construct 2 were answered using a five-point scale from 1 (not at all true for me) to 5 (extremely true for me).

Construct 1. Influence of Food Restriction on Psychological Well-Being

17. When I am restricting food intake, it is hard for me to think about anything but food and eating.
18. When I am restricting food intake, I become irritated more easily.
19. When I am restricting food intake, I feel more anxious.
20. When I am restricting food intake, I prefer being alone to being with people.
21. When I am restricting food intake, I more often feel sad.
22. When I am restricting food intake, the world seems like a hostile place to me.
23. When I am restricting food intake, I am upset when I am around people who are eating.
24. When I am restricting food intake, I concentrate more on myself.

Construct 2. Bodily Symptoms of Food Restriction

25. When I am restricting food intake, I feel weaker than usual.
26. When I am restricting food intake, I get drowsy more easily.
27. When I am restricting food intake, I am more likely to get headaches.
28. When I am restricting food intake, I am more likely to get dizzy.
29. When I am restricting food intake, I am more sensitive to cold.
30. When I am restricting food intake, I am more likely to have trouble falling asleep.
31. When I am restricting food intake, I feel more energized. (Reverse scoring)
Construct 3. Localization of Hunger in the Body

33. Circle all the parts of your body in which your feelings of hunger are localized when you are restricting food intake:

Part 3 of the Questionnaire

All the questions included in Part 3 were answered using a five-point scale from 1 (not at all helpful) to 5 (extremely helpful).

Group 1. Reducing Hunger

33. To cope with restriction of food intake, it would be helpful to train myself to find foods unappealing (e.g. to start to think that they are too sweet, too greasy).
34. To cope with restriction of food intake, it would be helpful to start smoking cigarettes to reduce my hunger.
35. To cope with restriction of food intake, it would be helpful to have a slight illness that would take away my hunger.
36. To cope with restriction of food intake, it would be helpful to take some medicines to suppress hunger.

Group 2. Reframing Restriction

This group consisted of a three-item Construct 4 and several related items

Construct 4 questions:

39. To cope with restriction of food intake, it would be helpful to envision myself as stronger than people who do not restrict food intake.
40. To cope with restriction of food intake, it would be helpful to look down on people who do not restrict food intake.
42. To cope with restriction of food intake, it would be helpful to feel superior to other people because of my ability to stand hunger.
Other questions included in Group 2:

37. To cope with restriction of food intake, it would be helpful to train myself to perceive hunger as a sign of success.
38. To cope with restriction of food intake, it would be helpful to teach myself to find pleasure in the feeling of hunger.
41. To cope with restriction of food intake, it would be helpful to feel proud of myself for being able to restrict food intake.
43. To cope with restriction of food intake, it would be helpful to think of hunger as an enemy I must fight with and overcome.
44. To cope with restriction of food intake, it would be helpful to think of the act of eating as something bad.
52. To cope with restriction of food intake, it would be helpful to punish myself in some way any time I stop restricting food.

Group 3. Distraction from Hunger

45. To cope with restriction of food intake, it would be helpful to engage in physical activity (e.g. exercise) to avoid concentrating on hunger and food.
46. To cope with restriction of food intake, it would be helpful to keep my mind distracted from hunger and food (e.g. by talking to people, reading books).
47. To cope with restriction of food intake, it would be helpful to spend more time sleeping.
48. To cope with restriction of food intake, it would be helpful not to dwell on thoughts about food and eating.
**Group 4. Importance of Restriction**

This group consisted of items belonging to Construct 5.

49. To cope with restriction of food intake, it would be helpful to remind myself often about the importance of my food restriction.
50. To cope with restriction of food intake, it would be helpful to make food restriction the highest priority in my life.
51. To cope with restriction of food intake, it would be helpful to not to let anything in my life interfere with food restriction.

**Group 5. Environmental Support**

53. To cope with restriction of food intake, it would be helpful to be restricting with a group of other people who were also restricting to get support from them.
54. To cope with restriction of food intake, it would be helpful to ask my family and friends to give me support and encouragement.
55. To cope with restriction of food intake, it would be helpful to ask people who live with me not to eat in my presence.
56. To cope with restriction of food intake, it would be helpful to ask people who live with me not to talk about food and eating in my presence.

**Group 6. Spiritual Practices**

This group consisted of questions belonging to Construct 6.

57. To cope with restriction of food intake, it would be helpful to engage in spiritual practice (e.g. pray, meditate).
58. To cope with restriction of food intake, it would be helpful to ask Buddha or God for help with resisting hunger.
59. To cope with restriction of food intake, it would be helpful to dedicate my hunger-related suffering to the benefit of all people.
60. To cope with restriction of food intake, it would be helpful to perceive restriction and my feeling of hunger as opportunities for spiritual development.
61. To cope with restriction of food intake, it would be helpful to keep in mind that there are people in the world who suffer from hunger much more than I do.

62. To cope with restriction of food intake, it would be helpful to concentrate on feelings of love and compassion towards all people.

63. To cope with restriction of food intake, it would be helpful to avoid negative emotions (e.g. anger, jealousy, envy) during the period of food restriction.

64. To cope with restriction of food intake, it would be helpful to perceive the feeling of hunger as a reminder of the unavoidable suffering of human existence.

65. To cope with restriction of food intake, it would be helpful to accept the feeling of hunger.

66. To cope with restriction of food intake, it would be helpful to accept that it is necessary for me not to eat.

**Group 7. Acceptance of your Situation**

67. To cope with restriction of food intake, it would be helpful not to be angry with myself for thinking about food and hunger.

68. To cope with restriction of food intake, it would be helpful to perceive restricting food and feeling hungry as something humorous.

**Group 8. Calming of Mind by Non-Spiritual Means**

69. To cope with restriction of food intake, it would be helpful to spend more time alone.

70. To cope with restriction of food intake, it would be helpful to avoid being around nervous people.

71. To cope with restriction of food intake, it would be helpful to avoid stressful life situations.

72. To cope with restriction of food intake, it would be helpful to stay relaxed.
Appendix F. Statistical Tables

Part 1 – Two-Way ANOVA

Description of sources:

Nationality  – comparison of Americans and Tibetans
Gender  – comparison of pooled male (Tibetans and Americans) and pooled female participants (Tibetans and Americans) – not used in the analysis

Table 5.
Two-Way ANOVA. DV: Question 6

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Table 12.

Two-Way ANOVA. DV: Question 14

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*Two-Way ANOVA. DV: Question 15*

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Table 14.

*Two-Way ANOVA. DV: Question 16*

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*Two-Way ANOVA. DV: Construct 1*

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Two-Way ANOVA. *DV: Construct 2*

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Table 17.
Two-Way ANOVA. *DV: Question 33*

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Two-Way ANOVA. *DV: Question 34*

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Two-Way ANOVA. DV: Question 35

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Table 20.
Two-Way ANOVA. DV: Question 36

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Table 21.
Two-Way ANOVA. DV: Construct 4

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*Two-Way ANOVA. DV: Question 37*

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Table 23.

*Two-Way ANOVA. DV: Question 38*

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Table 24.

*Two-Way ANOVA. DV: Question 41*

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Table 25.

**Two-Way ANOVA. DV: Question 43**

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Table 26.

**Two-Way ANOVA. DV: Question 44**

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Table 27.

**Two-Way ANOVA. DV: Question 45**

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Table 28.

*Two-Way ANOVA. DV: Question 46*

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Table 29.

*Two-Way ANOVA. DV: Question 47*

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Table 30.

*Two-Way ANOVA. DV: Question 48*

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Two-Way ANOVA.  DV: Construct 5

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Two-Way ANOVA.  DV: Question 52

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Two-Way ANOVA. **DV: Construct 6**

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Two-Way ANOVA. **DV: Question 67**

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Two-Way ANOVA. **DV: Question 68**

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Table 41.
Two-Way ANOVA. DV: Question 70

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Two-Way ANOVA. DV: Question 71

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Table 43.

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## Part 2 – T-Tests

### Table 44.

*Comparison of Tibetan and American Men – T-Tests and Equality of Variances*

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Table 45.

*Comparison of Tibetan and American Women – T-Tests and Equality of Variances*

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Table 46.

Comparison of Tibetan Men and Women (Monks and Nuns) – T-Tests and Equality of Variances

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Equality of Variances

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Table 47.

*Comparison of American Men and Women – T-Tests and Equality of Variances*

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Appendix G. Factor Analysis for Tibetan Version of Questions 33-72

Figure 9. Scree Plot of Eigenvalues (axis X – The order of eigenvalues, axis Y – Eigenvalues).

Table 48. Inter-Factor Correlations

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Table 49.

Rotated Factor Pattern (Standardized Regression Coefficients)

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References


Benedict, F. (1915). Chemical and physiological studies of a man fasting thirty-one days. *Proceedings of the National Academy of Science, 1*, 228-231.


