

College Students' Health Status: Readiness to Change  
Dietary Intake and Physical Activity Habits

by

Mark Ervin Mittag

A Research Paper  
Submitted in Partial Fulfillment of the  
Requirements for the  
Master of Science Degree in  
Mental Health Counseling

Approved: 2 Semester Credits



Dr. Ann M. Parsons  
Research Advisor

The Graduate School  
University of Wisconsin-Stout

July, 28, 2008

**The Graduate School  
University of Wisconsin-Stout  
Menomonie, WI**

**Author:** Mittag, Mark E.

**Title:** *College Students' Health Status: Readiness to Change Dietary Intake and  
Physical Activity Habits*

**Graduate Degree/ Major:** MS Mental Health Counseling

**Research Adviser:** Parsons, Ann M. Dr.

**Month/Year:** July, 28, 2008

**Number of Pages:** 80

**Style Manual Used:** American Psychological Association, 5<sup>th</sup> edition

ABSTRACT

College choices impact long-term health behaviors of students and alumni. The university plays a supporting role in the development of healthy lifestyles. This study, as part of a larger study, examined college students on three health behaviors, 1) daily consumption of five servings of fruits & vegetables, 2) low-fat diet, and 3) regular physical activity. Participants (N=71) were selected by enrollment in one of four general education courses (FN-102, BIO-111, ENGL-101, & SPCOM-100). Self-report data was gathered via an online survey, which included a demographics section and questions concerning self-efficacy (SE), decisional balance (DB), and stages of change (SOC) (three constructs of the Transtheoretical Model of Change) for these three-health behaviors. Approximately 80% (n=55) of the sample were in pre-action stages for healthy fruit and vegetable consumption. Also, more than half of the sample (n=39) did not regularly avoid fatty foods. More than 65% (n=45) regularly exercised and another 35%

exercised some (n=9) or were planning to (n=15) within the next six months. Relational patterns were observed between SE and DB across SOC. The findings of this study warrant further investigation of student health behaviors in regards to knowledge, practice, and intentions of healthy lifestyles. An attempt was made to assess the effectiveness of a course (FN-102) with learning objectives focusing on improving dietary and exercise behaviors in students; however, due to high attrition at post-test collection no analysis was possible for this portion of the study.

The Graduate School  
University of Wisconsin Stout

Menomonie, WI

Acknowledgments

I was assisted by many individuals and departments while writing my thesis, and though I cannot name everyone I would now like to take the time to name a few. First I would like to thank my fiancé, Ashley, for her patience and support throughout this process. Also, I would like to thank Susan Greene for her indispensable guidance while completing data analysis. I would like to acknowledge my fellow researcher Katie Anderson for her assistance with development and implementation of our survey tool. Finally, I would like to thank my advisor Ann Parsons for her leadership and for the knowledge she has imparted to me. Thank you to all who I have named and those who I have not named.

## TABLE OF CONTENTS

	Page
.....	
ABSTRACT.....	ii
List of Tables .....	vii
List of Figures .....	viii
Chapter I: Introduction.....	1
<i>Statement of the Problem</i> .....	1
<i>Purpose of the Study</i> .....	3
<i>Assumptions of the Study</i> .....	3
<i>Definition of Terms</i> .....	4
<i>Methodology</i> .....	6
Chapter II: Literature Review .....	7
Chapter III: Methodology .....	13
<i>Subject Selection and Description</i> .....	13
<i>Instrumentation</i> .....	13
<i>Data Collection Procedures</i> .....	15
<i>Data Analysis</i> .....	15
<i>Limitations</i> .....	16
Chapter IV: Results.....	17
Chapter V: Discussion .....	25
<i>Limitations</i> .....	25
<i>Conclusions</i> .....	25
<i>Recommendations</i> .....	28

References.....	30
Appendix A: Syllabus for FN-102.....	35
Appendix B: Survey tool.....	38
Appendix C: IRB approval .....	63
Appendix D: Control and experimental groups pre-post-test figures and tables.....	64

## List of Tables

Table 1: SOC and T Scores for the baseline.....	18
Table 2: Mean SOC and t-scores for the experimental sample (pre-test/post-test).....	23

## List of Figures

Figure 1: Distribution across SOC for three behaviors.....	19
Figure 2: SE t-scores across SOC for three behaviors.....	19
Figure 3: DB pros and cons for fruit and vegetable consumption.....	20
Figure 4: DB pros and cons for adherence to a low-fat diet.....	21
Figure 5: DB pros and cons for regular physical activity.....	22



## Chapter I: Introduction

This study will focus on applying the Transtheoretical Model (TTM) developed by Prochaska and DiClemente (1982) to assess college students' readiness to change behavioral patterns of three healthy lifestyle habits proven to maintain health and prevent chronic disease, specifically heart disease. This research seeks to establish baseline measures for the behavioral readiness of UW-Stout's student population concerning regular consumption of five servings of fruits and vegetables, limiting dietary-fat to less than 30% of total caloric intake, and maintaining regular physical activity for at least 20 minutes, three times per week.

Along with the previously stated objectives, this study will assess differences between students enrolled in courses designed to provide knowledge about said health behaviors, and the general population. The following will review the ability of such behaviors to reduce the risk of developing heart disease and the rationale for addressing such behaviors in undergraduate students. Also, TTM will be defined along with a review of the existing research findings pertaining to its application to various populations in a variety of problem behaviors.

### *Statement of the Problem*

Heart disease is the number one killer for men and women in the United States. There are many risk factors that combine to put an individual at an increased risk for developing coronary heart disease (CHD) (Center for Disease Control, 2007). Strong evidence from epidemiological research has revealed that diets low in fiber and high in total cholesterol, saturated fat, and energy (calories) are a prime precursor to the development of heart disease. High blood cholesterol is a leading risk factor in the development of CHD. High blood cholesterol leads to atherosclerosis, which is the narrowing and hardening of arteries caused by deposits of lipids (National Cholesterol Education Program, 2005). The reversal of poor dietary habits, along with

an increase in physical activity, is proven to reduce overall risk for CHD as well as decrease the presence of elevated cholesterol levels (Center for Disease Control, 2007).

For most traditional students, college is a time to strive for independence and self-sufficiency (Mulder & Clark, 2002). This independence includes making decisions on what to eat as well as when and how often to exercise. College is the developmental period where interventions could be most effective in facilitating growth of habits for prevention of chronic disease later in life (Huang et al, 2003). However, many students exercise infrequently and intake inadequate servings of fruits and vegetables (Huang et al, 2003). These poor choices in diet and activity are a product of students not having the knowledge needed to accurately assess or reduce their risk factors.

Sixty-eight percent of undergraduate respondents (N=470) at two major universities rated themselves as having a lower or much lower risk than peers for developing heart disease (Green, Grant, Hill, Brizzolara, & Belmont, 2003). This reveals an expression of optimistic bias. There is a theme emerging where college-aged men and women do not accurately perceive or recognize the presence of elevated risk for heart disease. Also, a study of 192 male and female undergraduates sought to assess knowledge of three themes related to dietary recommendations, i.e., food consumption, healthful eating, and the relationship between diet and health. The researchers found students had a low level of awareness about all of these topics (McArthur, Grady, Rosenberg, & Howard, 2000). The two previous studies reveal a degree of inaccurate self-assessment along with insufficient knowledge of healthy eating habits. The main problem, therefore, is a lack of awareness, and for this reason an increasing consciousness of the problem and available solution is the most practical response.

Students enrolled in classes emphasizing healthy behaviors and exploring the consequences of these behaviors are actively increasing their knowledge. This awareness increases consciousness of causes, consequences, and cures, which logically creates an impetus to change. For these reasons, students enrolled in Nutrition for Healthy Living (FN-102) provide an opportunity to examine how consciousness-raising affects the process of change.

#### *Purpose of the Study*

The goal of this study is to produce baseline measures for University of Wisconsin-Stout (UW-Stout) students' readiness (Stages of Change (SOC)), perceived ability (Self-efficacy (SE)), and decisional progression (Decisional Balance (DB)) in regards to adopting the following behaviors: consumption of five or more servings of fruits and vegetables, daily intake of less than 30% of calories as fat, and regular physical activity. Also, differences will be examined between groups of undergraduate students enrolled at UW-Stout from either the general population or two sections of a course, (FN-102), designed to increase knowledge and the ability to apply guidelines set by the United States Department of Agriculture (USDA) for nutrition, health, and optimal physical well-being.

#### *Assumptions of the Study*

This study assumes the following: participants will respond to survey materials honestly and accurately according to their behaviors and intentions each time they provide data. Also, it is assumed the instructor of FN-102 achieved the learning objectives as stated in the syllabus (see Appendix A) and students acquired a reasonable level of understanding of these objectives. Finally, this study assumes students enrolled in the BIO-111, ENGL-101, and SPCOM-100 are representative of the general population of UW-Stout.

### *Definition of Terms*

*Transtheoretical model.* In developing the TTM of behavioral change, Prochaska and DiClemente (1982) compared 18 leading therapy systems. They found that consciousness raising was applied in 16 of 18 therapy systems. Consciousness raising begins the process of change by introducing individuals to the knowledge that a problem, such as poor dietary consumption & physical inactivity, exists. Often this is accomplished through informing individuals of the causes, consequences, and cures associated with problem behaviors (Prochaska & Velicer, 1997). In the current study, the problem behavior is lifestyles resulting in an increased risk of CHD with cures that include an increase in fruit and vegetable consumption, decreases in dietary fat, and increases in physical activity.

The TTM includes many processes of change; however, this study will focus on consciousness raising because it is the overall objective of the course Nutrition for Healthy Living (FN-102), which has been chosen to act as an intervention for this investigation. Constructs central to the process and assessment of progress in the TTM of change include SOC, SE, and DB.

*Stages of change.* SOC consists of the following five stages: precontemplation, contemplation, preparation, action, and maintenance. Individuals who are uninformed or under informed characterize the *precontemplation* stage; also, these people will often avoid reading, talking or thinking about their risky behaviors. *Precontemplators* do not plan to take action within the next six months. *Contemplators* plan to take action within the next six months. While people in the contemplation stage are more aware of their risky behavior, they may not be ready to make changes. These individuals may experience ambivalence as they weigh the pros and

cons of the decision to change their behavior. This continued appraisal of the costs and benefits to change behavior is often referred to as chronic contemplation (Prochaska & Velicer, 1997).

*Preparation* is the stage where an individual plans to take action within the next 30 days. These people frequently have taken some noteworthy action in the last year. Those in this stage have a plan, which may include joining a health education class, speaking to a dietitian or doctor, reading a self-help book, or using self-change strategies. Individuals in the *action* stage have modified their behavior in a specific way in the past six months. This changing of behavior is measurable and must meet certain guidelines. For example, when trying to reduce risk for CHD, an individual would be expected to consume less than 30% of calories from fat. *Maintenance* is the stage where individuals are trying to prevent relapse and do not employ change processes as often as those in the action stage. These people are more confident and less likely to be tempted to revert back to past behavior (Prochaska & Velicer, 1997).

*Self-efficacy*. SE is a concept integrated from Albert Bandura's (1977) theory, which estimates situation-specific confidence individuals have in regards to coping with situations that may prevent completion or persistence of the behavioral change. Individuals attempting to increase physical activity may be asked to rate the likelihood of their ability to exercise when they are feeling tired (Prochaska & Velicer, 1997). Individuals in the action and maintenance stages consistently display greater SE scores than those in pre-action SOC (Marcus & Owen, 1992, Marcus, Eaton, Rossi, & Harlow, 1994, Herrick, Stone, & Mettler, 1997). Due to this heightened efficacy in action and maintenance; Marcus et al (1994) recognized SE as an indicator of current and future exercise behavior. As an indicator, SE is closely associated with intentions to exercise and is a predictor of physical activity (Marcus et al, 1994).

*Decisional balance.* DB is the process of considering the costs and benefits of a particular action (Janis & Mann, 1968). This is a course of action that is important throughout the process of change, but becomes more crucial as individuals move toward higher stages of change. Those in the preparation stage labor with this process more than any other group (Prochaska & Velicer, 1997). Preparation is about making a plan and is also the period when the individual must decide whether the benefits of change justify the consequences of taking action.

#### *Limitations of the Study*

Limitations of this study include a small sample size due to a low pre-test response rate and high attrition at post-test collection. Some selection bias and social desirability bias may be present due to the self-report data and the positive assessment of such health behaviors by society.

#### *Methodology*

A pre-test/intervention/post-test experimental design was used to assess the effectiveness of FN-102 as an intervention for healthier eating and physical activity. The pre-test data included a number of individuals that did not go on to complete the post-test. This data was used to establish baseline measures for UW-Stout students. The survey tool used consisted of four parts. The survey begins with a demographic section, which assessed age, gender, class rank, ethnicity, etc. Then a SOC section assessed readiness to change behavior by asking participants to choose the stage that best described their present intentions from five statements corresponding to the five SOC, for all three behaviors. The SE measure asked individuals to rate, on a Likert scale, their confidence to persist in each behavior in various challenging situations. DB tools presented participants with situations designated as either pro or con and asked them to rate, on a Likert scale, the likelihood of choosing to perform the healthy choice.

## Chapter II: Literature Review

There are many psychological, behavioral, and environmental factors which determine how and why people do or do not change behaviors. Prochaska and DiClemente (1982) discovered five processes of change while they developed the three main constructs of the TTM of behavioral change, i.e., SOC, SE, and DB. Most importantly, this model reveals how and when individuals use the five processes of change differently across stages. Individuals seeking change with or without therapy apply verbal processes in earlier SOC and behavioral processes more in later stages, after they have become committed to change. In earlier stages, e.g., contemplation, verbal processes are used both at the experiential and environmental levels. Consciousness-raising is a verbal process that consists of education experienced at an environmental level, and feedback, which is gathered in an experiential context (Prochaska & DiClemente, 1982). Education is especially important in the stages focusing on contemplation and determination since these individuals are generally uninformed or under informed about risky behaviors and may not intend on changing (Prochaska, DiClemente, & Norcross, 1992).

Using the TTM to examine relationships between SE and DB across SOC allows for proscriptive information, in the form of tailored interventions, and to observe when shifts in attitudes, intentions, and behaviors take place (Prochaska et al, 1992). Consciousness-raising in the contemplation stage creates movement toward preparation where individuals re-evaluate problem behaviors and plan to take action. When moving into action, behavioral processes such as stimulus control and counter conditioning become more important (Prochaska et al, 1992). According to Prochaska (1992), change is essentially “doing the right things (processes) at the right time (stages)” (p. 1110) and the TTM allows for coordination of these two components.

### *Smoking Behaviors*

The first problem behavior addressed by the TTM was smoking cessation. The following is a review of the existing research on smoking cessation as addressed by the TTM. The population of focus for this research was adults in work settings and the general population of the United States. No research was found addressing smoking cessation in college students.

DiClemente and Prochaska (1982) compared 29 self-changers and 36 therapy-changers and found the two utilize processes in similar ways across the SOC. As stated earlier, verbal processes were used in earlier stages and behavioral processes were applied in later stages. However, when smokers in the maintenance stage relapsed, consciousness-raising was used as often as participants in the contemplation stage (Prochaska & DiClemente, 1983). The relapse phenomenon reveals that change is not a linear progression and individuals may regress to prior stages/processes to regain determination/control over behaviors. While the processes utilized vary across stages, so too do the levels of confidence (SE) and consideration of the choice (DB) to persist in the process of change.

Prochaska, Velicer, DiClemente, Rossi, and Guadagnoli (1991) established linear patterns between SE and DB across stages of change through a cross-sectional and longitudinal analysis of a naturalistic sample of smokers (N=544). Prochaska et al., (1991) discovered temptation to smoke (pros on DB) decreased and SE increased as participants progressed to higher stages of change. This inverse linear relationship between pros of smoking and SE was concurrently reported by DiClemente et al (1991), with findings that individuals in the preparation stage had SE t-scores significantly higher than those in precontemplation, while pros of smoking decreased from precontemplation to preparation. Together these two findings highlight the TTM's ability to provide significant insight into the course of change and how



cognitive shifts in perception of ability to change and choice interact across stages. However, to establish the TTM as applicable to other behaviors, replication of these patterns is necessary.

#### *Generalization to Other Behaviors*

Similar to smoking, DB assessment tools typically define a pro as a barrier (temptation) to change. These temptations are the positive benefits of continuing eating a high-fat diet, i.e., eating food they enjoy, while a con is the perceived costs of changing their diet to reduce fat intake, i.e., eating fatty foods they enjoy less often. This premise is reversed for acquisition of healthy behaviors such as increasing consumption of fruit and vegetable and exercise. In these behaviors, cons are negative physical and social effects of not taking action and pros are the benefits, which will be acquired by making the change, e.g., regular exercise improves overall health.

Marcus and Owen (1992) developed SOC, SE, and DB measures for exercise by adapting similar instruments created for smoking cessation (Prochaska & DiClemente, 1983) and validated them with a sample (N=1093) of men and women from four worksites in Rhode Island. From these measures the researchers found SE and DB scores to be significantly linked to SOC. SE scores remained lowest in precontemplators and contemplators, while those participants in the maintenance stage exhibited the highest-scores. DB pros were lower than cons in precontemplation and the opposite was true in the maintenance stage (Marcus & Owen, 1992). Marcus, Rakowski, and Rossi (1992) used the SOC and DB measures produced by the previous study to investigate a sample (N=778) of men and women recruited from worksites and found that DB accounted for 60.4 percent of the variance across SOC for exercise. The ability to account for such a high amount of the variance appears to prove the predictive power of DB in regards to progression toward behavioral change for exercise. Also, the replication of similar

relational patterns to those established in smoking cessation (Prochaska & DiClemente, 1983) between pros and cons across SOC for exercise makes a strong case for the translation of the TTM to other behaviors beyond smoking cessation (Marcus et al, 1992).

While Marcus et al proved TTM to be applicable to exercise behavior; other studies took this work a step further by investigating a wider range of topics. Prochaska et al. (1994) looked at SOC and DB for 12 problem behaviors (including weight control, high-fat diets, and exercise acquisition) and found highly predictable patterns. In all 12 samples the cons of changing behavior outweighed the pros for participants in the precontemplation stage, while the reverse relationship was found in individuals in the action stage. The DB relationship across SOC suggests movement from contemplation to action requires a decrease in cons followed or preceded by an increase in pros. This transverse between pros and cons for exercise acquisition was preparation and for high-fat diets this change was observed in the action stage, but may also have occurred in preparation (Prochaska et al., 1994).

Herrick, Stone, and Mettler focused on four health behaviors, including exercise frequency and dietary fat intake in a sample (N=393) taken from a worksite environment (1997). Herrick et al found that subjects participating in wellness programs and those not participating significantly differed in their distribution across SOC on exercise and dietary fat intake. Higher concentrations of wellness participants were found in the maintenance stages for both behaviors. While greater numbers of non-wellness participants were in precontemplation for dietary fat and precontemplation and preparation for exercise. Similar to Prochaska et al (1994), predictable relationships between DB and SE across SOC emerged for both behaviors, however, crossover for pros and cons occurred in the action stage, not in preparation (Herrick, Stone, & Mettler,

1997). It appears TTM is applicable to the behaviors of exercise and adherence to a low-fat diet, but little research exists on these behaviors in college students and other young adults.

Frucht (1998) used the TTM to address adherence to a low-fat diet and regular physical activity in college students enrolled in two wellness courses. Frucht assessed SOC, SE, and DB for both behaviors. SOC were assessed by posing a question regarding the participants consistently avoided eating high fat foods and regularly exercised three times a week for at least 20-minute periods. The participants were given five statements to choose from, which corresponded to the five SOC. SE measures asked participants to rate how likely they were to carry out the specific behavior in various situations. The study found similar relationships to that of research done on adult populations for SE and DB across SOC for both low-fat diet and regular exercise, which further validated the use of the TTM with these behaviors as an assessment tool for young adults (Frucht, 1998).

Apparent from the previously reviewed research is that the TTM is applicable to college students in terms of adherence to regular exercise and a low-fat diet but the existing body of work on fruit and vegetable intake is quite limited for all populations. Ma, Betts, and Horacek (2001) conducted one of the first studies assessing readiness to increase fruit and vegetable consumption in 18 to 24 year-olds with a majority of the population comprised of college students (62%). Ma et al. used staging algorithms consisting of a 15-item questionnaire for both fruits and vegetables. The researchers found 46% of males (n=116) SOC and 43% of females (n=185) resided in the pre-action (Ma et al, 2001). Also, the researchers found fruit and vegetable intake increased across SOC, which verifies the validity of the TTM to assess such behaviors.

Ma et al (2002) used SOC, SE, and DB to assess fruit and vegetable consumption in 18 to 24 year-olds and 50% of the total population (N=1545) consisted of current students. The distribution of participants across stages showed 43.7% of the sample resided in pre-action SOC for fruit and 70.8% for vegetable consumption. Intake increased linearly across stages with precontemplators eating the fewest and those in the maintenance stage consuming the highest amount of servings (Ma et al, 2002). Also, SE increased with progression to higher SOC with action-takers and maintainers experiencing the highest confidence. A crossover for higher pros and lower cons occurred between contemplation and action. Participants in the action-oriented stages exhibited high pro and low con scores, as well as the highest fruit and vegetable intake (Ma et al, 2002).

By establishing predictable patterns between the main constructs of TTM across a wide range of problem behaviors with a variety of populations, past research validates this theory as a tool for assessment, observation, and interventions throughout the change process.

## Chapter III: Methodology

### *Subject Selection and Description*

Participants were selected by enrollment in targeted sections of four general education courses (FN-102, BIO-111, ENGL-101, & SPCOM-100). This selection method yielded a sample of 71 participants with a female majority of 73%. FN-102 was chosen to act as an experimental group because it is a large section course with learning objectives that provide the knowledge necessary to adopt the healthy lifestyle behaviors investigated here. Multiple sections of BIO-111, ENGL-101, and SPCOM-100 provided a control group, which consisted of a similar range of class rank as compared to the students enrolled in FN-102.

Participants enrolled in the experimental and the control groups simultaneously were assigned to the experimental group. One participant was excluded from data analysis due to prior enrollment in FN-102.

### *Instrumentation*

SOC, SE, and DB tools were developed using instruments previously validated and used by Ma, Betts, Horacek, Georgiou, White, & Nitzke (2002) for fruits and vegetables, Rossi (1993) for low-fat diet, and Marcus, Selby, Niaura, & Rossi (1992) for physical activity. The adopted tool (Appendix B) contained SOC questions for each behavior as well as sections consisting of questions regarding SE and DB of fruits and vegetables, low-fat diet, and physical activity. The SOC questions estimated participants' readiness to adopt each target behavior by asking them to plot themselves on a continuum of answers that correspond to the five SOC: precontemplation, contemplation, preparation, action, and maintenance. The instrument for SE estimated participants' confidence to carry out each target behavior while faced with a challenging situation. For example, item one on the SE estimation sheet for physical activity asks participants

to rate the likelihood of engaging in an exercise routine even when they are tired. The DB section estimated participants' progression toward readiness to adopt each target behavior. Individuals were asked to rate the importance of various pro and con statements in regards to deciding to make the specific changes. For example, item one on the DB sheet for low-fat diet asks participants to rate the importance of viewed as foolish for ignoring warnings about foods that are too high in fat.

### *Demographic survey*

A demographic section was included at the beginning of the current study's survey. The demographic survey contained numerous questions, some of which are not analyzed and reported here such as: age, residence (referring to on-campus, off-campus with parents or relatives, or other), if the participant smokes and if so how many packs per week, gender, ethnicity, grade level, hours of paid work per week the participant is involved in, hours of volunteering per week, how many hours are spent studying per week, their weight, height, and if they have ever had their cholesterol checked before (see Appendix B).

### *Determinants of weight change in college students*

This survey asked a group of questions targeted at gathering information about dietary intake and physical activity (Appendix B). Dietary variables included in the survey were daily servings of total fruit, total vegetables, dairy, whole grains, daily intakes of fiber and weekly breakfast consumption. Information on physical activity is also included to determine how physically active the participants are. Information gathered by this portion of the survey will be used to reveal patterns across SOC between SE and DB in regards to self-reported behavior; however, this information will be reported elsewhere.

### *Data Collection Procedures*

This study gathered baseline data as well as employed a pre-test-intervention-post-test control group design in which the pre-test data (from a larger group of students) was used as the baseline. All aspects of this study were approved by the Institutional Review Board (Appendix C). The participants gave their consent by accessing and submitting survey answers on Select Survey (2004). By using an online survey, paper cost and waste were minimized. Participants were asked to provide their UW-Stout email username as a unique identifier to protect confidentiality as they gave consent.

As an incentive to participate in this study, participants were entered into a drawing for an opportunity to win \$200, \$100, \$50, \$30, or \$20. Distribution of moneys followed University guidelines. Only those subjects who complete all forms of data collection were eligible for the drawing. All eligible individuals had equal odds of winning each prize. The researchers conduct the drawing in a confidential space by placing the usernames of eligible participants in a bowl, and then withdrew five names. The first name drawn received the top prize, second name drawn received the second prize, etc. All names were shredded at the completion of the drawing. The winners were notified by email and instructed to claim their prize by visiting the secretary of the Biology Department. The secretary did not know the purpose or the contents of the envelope. Email usernames were written on the outside of the envelope and the winners were asked to produce their UW-Stout ID card in order to receive their envelopes.

### *Data Analysis*

A number of statistical analyses as noted in results were used in this study. The Statistical Program for Social Sciences, version 15.0, (SPSS, 2006) was used to analyze the data. Raw scores for SE and DB were converted to t-scores to produce uniform standard deviation and

mean scores. Baseline statistical significance for SE and DB t-scores was calculated by using a significance calculator from the World Wide Web (Graphpad Software, 2005).

### *Key of significance*

The following was used for all figures and tables included in this document.

T=p < 0.05 between pro and con

TT=p < 0.01 between pro and con

TTT=p < 0.001 between pro and con

f=p < 0.05 between stage 1 and stage 5

ff=p < 0.01 between stage 1 and 5

fff=p < 0.001 between stage 1 and 5

### *Limitations*

Limitations of this study include a small sample size due to a low pre-test response rate and high attrition at post-test collection. Some selection bias and social desirability bias may be present due to the self-report data and the positive assessment of such health behaviors by society. Another limitation with self-report data is honesty.



## Chapter IV: Results

The results are separated into two main sections. The first section is an analysis of the total initial data pool and represents baseline data for UW-Stout. The second section is a pre-intervention-post analysis also completed to determine if the course FN-102 impacts a student's SOC, SE and DB.

*(1) Establish baseline measures for college students' readiness (SOC), perceived ability (SE), and decisional progression (DB) in regards to adopting the following three behaviors; consumption of five or more servings of fruits & vegetables daily, intake of less than 30% of calories as fat, and regular physical activity.*

Subjects completed the survey at the beginning of the fall 2007 semester. The sample was predominantly composed of Caucasians (93%), females (73%), and freshmen (44%) with a mean participant age of 20 years old. Table 1 provides data grouped by various classifications. The sample sizes ranged between 58-68 subjects in the total population, 16-19 males, 40-49 females, 23-29 freshmen, 13-18 sophomores, 12-14 juniors, and 6-7 seniors

### *Fruit and vegetable consumption*

Concerning fruit and vegetable consumption data revealed most participants resided in pre-action (preparation, contemplation, or precontemplation). This cluster of students in pre-action SOC accounted for 77% (n=55) of the total sample (table 1). A closer look at this cluster reveal the contemplation SOC as containing the highest concentration of participants (n=30, see figure 1), with the next highest concentration observed in preparation (n=15).

Table 1

*SOC and T Scores for the baseline*

<b>F &amp; V</b>	<b>Frequency Across SOC</b>						<b>T Score (SD)</b>			
	Sample	1	2	3	4	5	SE	DB-pro	DB-con	pro-con
Total	69	10	30	15	7	7	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	0.03 (11.1)
Male	19	6	7	3	2	1	49.4 (9.6)	44.2 (10.8)	48.6 (8.4)	-4.4 (10.5)
Female	50	4	23	12	5	6	50.2 (10.3)	52.3 (8.7)	50.6 (10.6)	1.9 (11.0)
Fresh.	28	1	3	14	7	3	48.2 (10.3)	49.1 (10.3)	52.2 (11.9)	-3.1(11.0)
Sopho.	18	5	6	4	1	2	51.6 (9.8)	50.4 (9.8)	47.4 (6.7)	3.1 (10.6)
Junior	14	1	7	3	1	2	51.0 (10.3)	49.4 (11.2)	48.9 (8.7)	0.5 (9.7)
Senior	7	1	3	1	2	0	51.4 (9.3)	55.1 (5.6)	47.7 (8.6)	7.4 (13.2)
<b>Fats</b>										
Total	69	14	13	12	12	18	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-0.2 (11.6)
Male	19	9	3	1	2	4	48.1 (11.5)	51.5 (8.8)	47.4 (8.0)	3.4 (11.2)
Female	50	5	10	11	10	14	50.9 (9.3)	49.5 (10.4)	51.0 (10.6)	-1.5 (11.7)
Fresh.	30	4	8	7	5	6	54.4 (10.8)	50.9 (9.7)	49.3 (9.9)	1.2 (11.5)
Sopho.	18	6	3	1	3	5	46.8 (7.0)	48.6 (9.8)	51.0 (9.3)	-2.4 (8.7)
Junior	14	3	1	3	2	5	47.0 (10.1)	48.6 (11.8)	50.1 (12.4)	-1.5 (16.1)
Senior	7	1	1	1	2	2	48.2 (9.5)	52.4 (9.5)	50.9 (8.7)	1.5 (9.1)
<b>PA</b>										
Total	69	0	15	9	17	28	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-0.2 (14.6)
Male	19	0	4	2	2	11	50.4 (12.8)	45.7 (11.3)	48.4 (9.8)	-2.7 (17.4)
Female	50	0	11	7	15	17	49.8 (8.8)	51.8 (9.0)	50.6 (10.1)	0.9 (13.4)
Fresh.	30	0	5	3	11	11	51.4 (8.9)	47.9 (10.7)	50.0 (7.6)	-2.0 (12.5)
Sopho.	18	0	6	2	4	6	45.6 (8.5)	52.4 (6.7)	52.8 (12.4)	-1.2 (13.7)
Junior	14	0	2	3	1	8	53.7 (12.8)	50.8 (11.9)	45.7 (12.4)	5.1 (20.1)
Senior	7	0	2	1	1	3	47.3 (8.9)	52.9 (9.0)	52.3 (6.4)	0.6 (14.5)

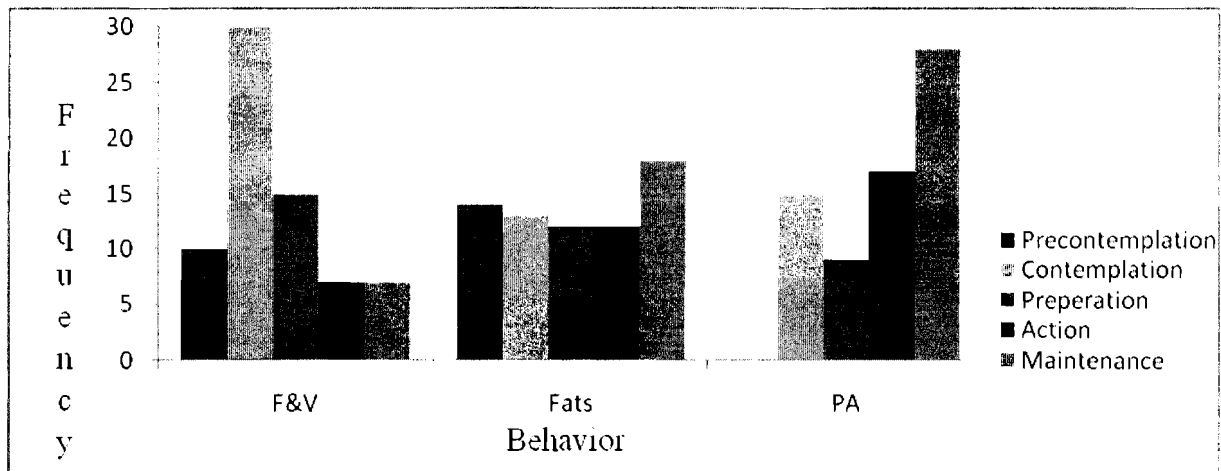


Figure 1. Distribution across SOC for three behaviors.

Though few resided in the maintenance SOC; these individuals exhibited the highest mean SE scores of any group. SE t-scores for participants in the maintenance SOC were found to be significantly higher when compared to precontemplators ( $p < 0.001$ , figure 2).

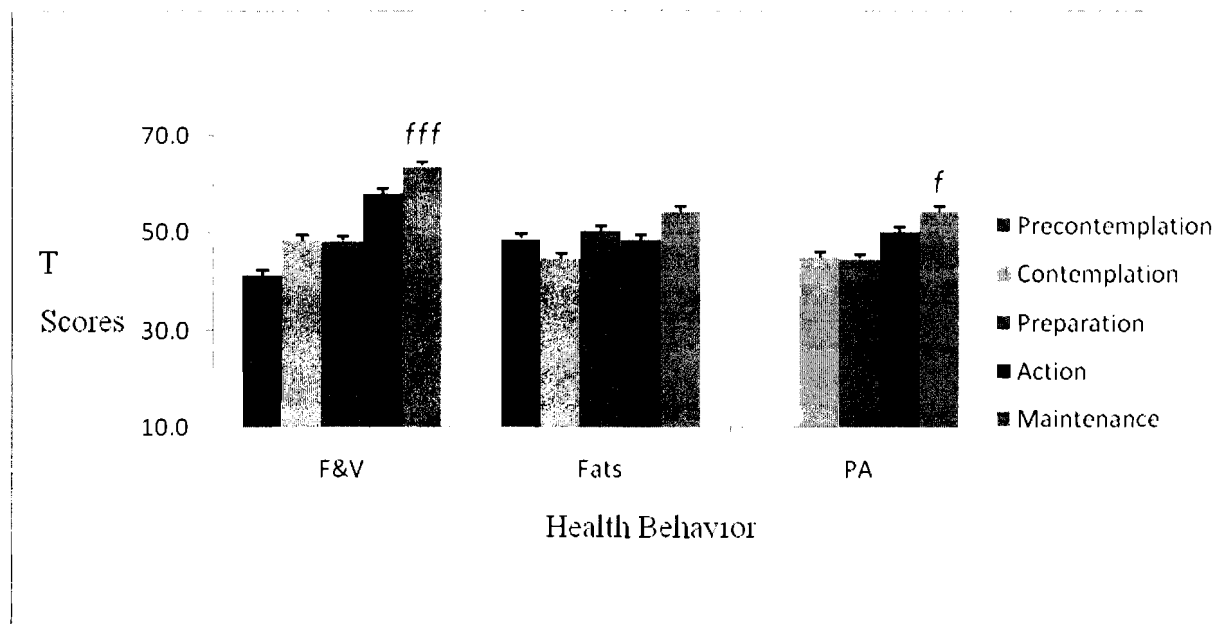


Figure 2. SE t-scores across SOC for three behaviors.

Also, DB-pros for maintainers were found to be significantly greater when compared to precontemplators ( $p < 0.001$ , figure 3). While precontemplators did not exhibit an elevated DB con score, a significant ( $p < 0.05$ , figure 3) difference existed between pro and con scores for this group.

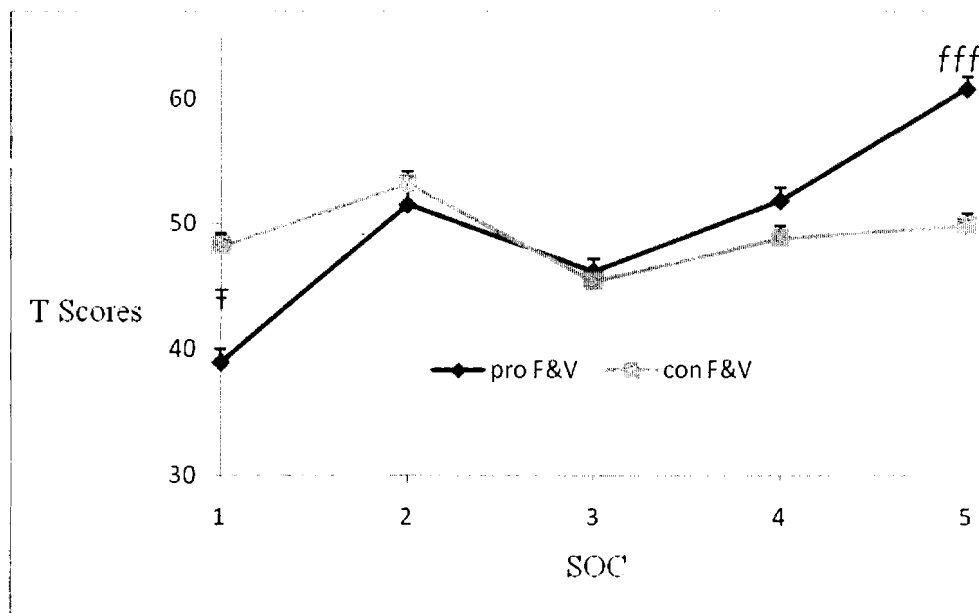


Figure 3. DB pros and cons for fruit and vegetable consumption.

In respect to gender and class rank for fruit and vegetable consumption, no significant differences were discovered for SOC or SE; however, females did exhibit a significantly higher DB pro t score ( $p < 0.01$ , table 1) compared to males.

#### *Fat consumption*

Participants were distributed near equally across SOC for adherence to a low-fat diet with the highest concentration residing in maintenance (figure 1). No significant differences were observed for SE across or between SOC. DB-pros to eat a high fat-diet differed significantly ( $p < 0.001$ , figure 4) between precontemplators and those in the maintenance SOC. A significant

difference existed between pro and con t-scores at the extreme SOC in precontemplation ( $p < 0.001$ ) and maintenance ( $p < 0.05$ ).

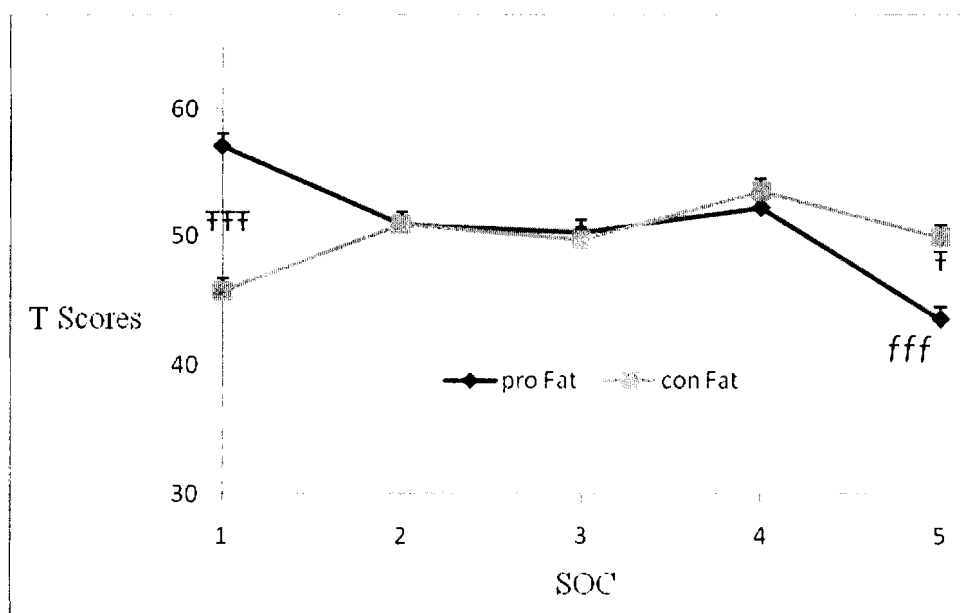


Figure 4. DB pros and cons for adherence to a low-fat diet.

As a group, females presented with a significantly higher SOC than males ( $p < 0.05$ , table 1) for choosing a low-fat diet. SE and DB scores did not differ significantly when compared by gender. No significant differences were found regarding class rank for SOC, SE, or DB to choose a low-fat diet.

#### *Physical activity*

SOC for physical activity revealed most participants were in action or maintenance stage, while no individuals were in precontemplation (figure 1). These maintainers displayed significantly higher SE t-scores when compared to contemplators ( $p < 0.05$ , figure 2). A significant ( $p < 0.01$ , figure 5) difference existed between pro and con scores in the contemplation SOC. Additionally, DB-cons were significantly ( $p < 0.001$ , figure 5) lower for those in the maintenance SOC when compared to contemplators.

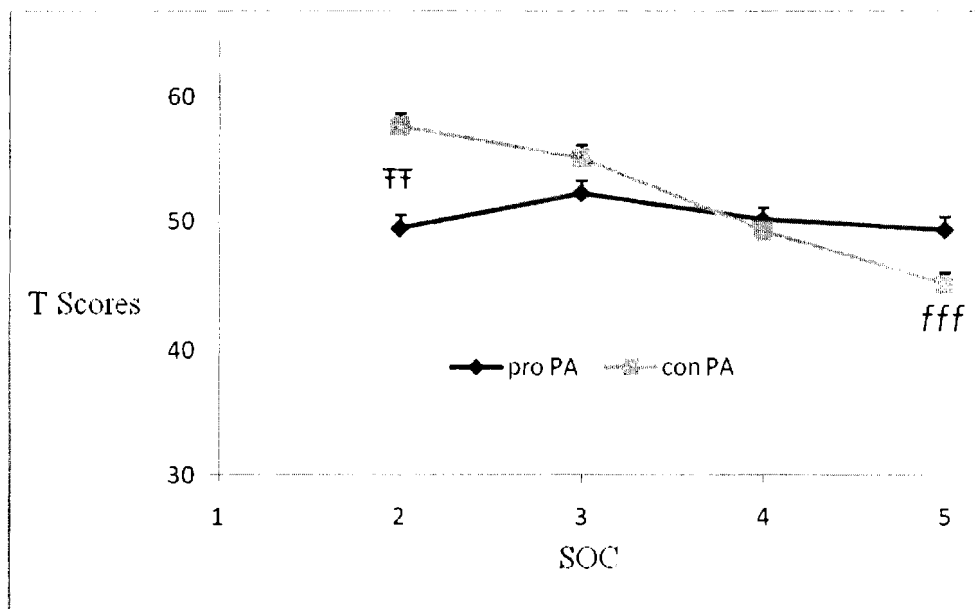


Figure 5. DB pros and cons for regular physical activity.

Females exhibited significantly higher DB pros than males for regular physical activity ( $p < 0.05$ , table 1); however, SOC and SE scores did not differ significantly by gender. No significant differences for physical activity emerged in respect to class rank for SOC, SE, or DB.

(2) *Assess participant's SOC, SE, and DB after completing FN-102-002: Nutrition for Healthy Living, a course that focuses on providing the knowledge needed to adopt these behaviors.*

The method of pre-test, intervention, post-test provided a sample which included 15 participants. The control group (students enrolled in BIO-111, ENGL-101, or SPCOM-100) included nine participants and the experimental group (FN-102 students) contained six participants. The sample was predominately Caucasian (93%) and female (67%) with an overall mean age of 22 years old. Independent sample t-test analysis of pre-test data for the control and experimental groups revealed no initial differences, in regards to gender or class rank. Due to high attrition, which resulted in a small sample size, no statistical analyses were possible between the control and experimental groups. Figures for pre-test and post-test data for both the

experimental and control are located in Appendix D. Had the sample size been sufficient, the difference across SOC for SE and DB between pre-test and post-test data for the three behaviors would have been compared by way of a paired sample t-test to reveal any changes within the control and experimental groups. A 2-way ANOVA would have been used to reveal any differences between the control and experimental groups across SOC for SE and DB. Also, a 3-way ANOVA would have been used to assess gender and class rank differences between the control and experimental groups across SOC for SE and DB.

Though no statistical analyses were possible between the control and experimental groups, the following were calculated to provide a snapshot for all three behaviors:

Table 2

*Mean SOC and t-scores for the experimental sample (pre-test/post-test)*

	Mean SOC		SE t-score		DB pro t-score		DB con t-score	
	Control	Exp.	Control	Exp.	Control	Exp.	Control	Exp.
FV	3.33/2.89	2.83/3.00	50.5/50.7	49.3/49.0	53.8/54.5	44.3/44.7	49.8/48.7	50.4/51.9
Fat	3.67/3.67	3.50/3.67	48.7/49.1	51.8/51.3	47.3/50.4	53.6/49.2	47.7/48.3	53.0/51.3
PA	4.44/4.44	3.67/3.50	50.4/49.0	49.5/51.5	52.8/53.9	45.0/44.1	49.0/49.0	51.5/52.0

In response to the lack of adequate sample size, the control and experimental groups were combined to create one group to allow for the analysis of a possible generic change during the fall semester regardless of experiences. Paired sample t-tests were conducted for the experimental group and revealed no significant differences between pre-test (early-fall) and post-test (late-fall) scores for SOC, SE, or DB for all three behaviors. In regards to gender, only females had a large enough sample size to conduct paired sample t-tests, which resulted in no

significant differences between early-and late-fall scores for SOC, SE, or DB for all three behaviors. For class rank, the researcher decided to split the four possible ranks of freshman, sophomore, junior and senior into lower (freshman/sophomore) and upper (junior/senior) class groups to better the chances of comparable groups, however, only the upper class group included a large enough sample to be eligible for analysis by a paired sample t-test. This analysis revealed no significant differences between early- and late-fall scores for SOC, SE, or DB for all three behaviors.



## Chapter V: Discussion

The TTM of behavioral change has been introduced and thoroughly reviewed throughout this investigation. Rationale for its use with a college-aged population has been demonstrated by a careful review of previous research focusing on similar populations. A survey was developed and given to an appropriately selected sample. The survey collected pre and post-test data on SOC, SE, and DB for three health behaviors (consumption of five or more servings of fruits & vegetables daily, intake of less than 30% of calories as fat, and regular physical activity). The data was analyzed and the results were reported. The following discussion will now focus on the limitations, conclusions, and recommendations stimulated by those results.

### *Limitations*

Limitations of this study include a small sample size due to a low pre-test response rate and high attrition at post-test collection. Some selection bias and social desirability bias may be present due to the self-report data and the positive assessment of such health behaviors by society. Another limitation with self-reported data is honesty.

### *Conclusions*

The sample surveyed in this investigation gives some evidence that UW-Stout students are not consuming fruits and vegetables at the recommended quantities set by the USDA. Approximately 80% of the sample was in pre-action SOC for fruit and vegetable consumption, whereas in a previous study, sampling a group of similar age, found roughly 45% of participants were in pre-action SOC for consumption of fruits and vegetables (Ma et al, 2001). This elevated cluster of participants in pre-action SOC must be looked at with caution due to the small sample size; however, getting college students into a higher SOC for eating fruits and vegetables should be addressed on campus. For SE, the present investigation found patterns equivalent to previous

studies of fruit and vegetable consumption, in that as the SOC increases so does the SE (Ma et al, 2001, and Ma et al, 2002). Also, similar to previous research, maintainers exhibited the highest SE of any group and were significantly higher than those in the precontemplation SOC (Ma et al, 2002). Patterns comparable to those found by Ma et al (2002) were observed for DB-pros and cons where precontemplators displayed higher cons than pros, with an opposite pattern emerging for maintainers. This switch, where DB-pros come to not only out-weigh the cons, but significantly increased across SOC, may indicate a decreased risk of relapse.

Unlike fruit and vegetable consumption, students were distributed evenly across SOC for choosing a low-fat diet. However, this differs from the findings of Frucht (1998) in that most participants were observed in the action or maintenance SOC for choosing a low-fat diet. As with SOC distribution, SE did not differ across the stages, which is inconsistent with the TTM as a whole, (Prochaska et al., 1991, DiClemente et al, 1991) specifically studies investigating consumption of fat (Frucht, 1998), since efficacy typically increases across SOC. DB-pros to eat a high-fat diet were significantly higher for those in the precontemplation SOC when compared to maintainers. DB-pros decreased dramatically for those in contemplation and again in maintenance. This fits with previous research on other unhealthy behaviors such as smoking, since the pros of eating a high-fat diet (or smoke cigarettes) become less influential toward actions as one becomes more aware (consciousness-raising) of the consequences (elevated risk of developing heart disease) of such behavior (Prochaska et al., 1991). Additionally, the researcher found a significant difference between pros and cons in precontemplation and again in the maintenance SOC, which illustrated the shift of influence between pros (appeal of fatty food) and cons (increased risk of developing heart disease). This significant difference seems to be quite logical; however, it was not explicitly reported by prior studies of choosing a low-fat diet in

college-aged populations.

Quite differently from SOC for low-fat diet, no participants resided in precontemplation for physical activity rather, most resided in maintenance. This is curious since past research has found many college students to exercise infrequently (Huang et al, 2003). However, this finding should be viewed cautiously due to the small sample size and because there is little research addressing the exercise habits of college students. Also, it is important to note several differences exist between UW-Stout and the University of Kansas-Lawrence (UKL). First the campus and student body of UKL are much larger than UW-Stout and is located in a large city rather than a small town like Menomonie, WI. Consistent with previous research findings on physical activity, and the TTM collectively; maintainers exhibited higher SE when compared to earlier SOC (DiClemente et al., 1991, Marcus & Owen, 1992). Likewise, maintainers displayed significantly lower con scores when compared to contemplators. These significant differences between maintainer's and contemplator's scores for SE and DB-con are again consistent with what would be expected when comparing said SOC. The cons for physical activity decreased while the pros changed little across SOC. This stability across stages may be an indication of the common knowledge held by society about the positive benefits of exercise. The decrease in cons may reveal the greater ability of participants at higher SOC to integrate exercise into their lives, which reduces the weight of such costs on time. This is the inverse of the decrease in pros for low-fat diet (eating fatty food you enjoy) because exercise cons (exercise is time consuming) carry less weight as an individual integrates this behavior into their life.

The present investigation was unable to determine the effectiveness of the consciousness-raising intervention provided by FN-102, however, through previous research the benefits of consciousness-raising interventions have been established (Prochaska, & DiClemente, 1982,

Prochaska et al, 1992, Prochaska et al, 1994, Herrick, Stone, & Mettler, 1997). Specifically, Frucht (1998) found the experimental group (stage-matched intervention) had significant stage movement from pre-test to post-test-2 (seven weeks after intervention) for physical activity in college students. Also, Frucht observed significant stage movement for the experimental group from pre-test to post-test-1 (one week after intervention) and post-test-2 for choosing a low-fat diet, however, there was no change between post-1 and post-2. The intervention utilized by Frucht was stage-matched and addressed participants' needs based on their specific SOC. The present study lacked this stage-tailored intervention which makes it difficult to compare it to past research.

The findings put forth by the present study are preliminary, however, they highlight the value of such research, and point to an apparent need for future investigations into UW-Stout's student population. The value is evident in that the university plays a fundamental role in the development of healthy life-styles for students. To fulfill this role it is essential to collect data which can be used to develop interventions to improve diet and physical activity levels in UW-Stout's students.

### *Recommendations*

Many implications for future investigations have been realized through the course of this research. First, conduct a large scale survey which would be disseminated to the whole student body. This would allow for a better understanding of the baseline measures for UW-Stout's student population for SOC, SE, and DB on the three health behaviors. Incentives would need to be creative and valuable to ensure the high response rate necessary for such an undertaking. This would most definitely need the cooperation of the university at the highest levels.

Second, to better utilize the full scope of the TTM, a small sample of students who reside in various SOC should be secured to conduct a more tailored intervention and to collect long-term follow-up data. The former baseline investigation suggested could be used to acquire the appropriate combination of participants. This study would include stage-matched interventions, which, would be delivered by trained counselors in one to one health counseling session. Also, physical measurements would be taken, such as lipid profiles at three, six, and 12 month intervals, which would allow for a more accurate assessment of progress made by participants in that an increase in SOC truly reflected a healthier lifestyle. The cooperation of a variety of campus departments would be necessary to undertake such an investigation. These departments would include Student Health Services, Counseling Services, and others not yet realized by this researcher. In addition, extending this study to multiple campuses would provide a better state or national snapshot of college student health.

## References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. Retrieved 07/15/07 from EBSCOhost database.
- Centers for Disease Control. (2005). Deaths: Leading Causes for 2002. *National Vital Statistics Reports 2005*, 53(17). Retrieved 04/30/07 from <http://www.cdc.gov/heartdisease/>
- DiClemente, C. C., & Prochaska, J. O. (1982). Self-change and therapy change of smoking behavior: A comparison of processes of change in cessation and maintenance. *Addictive Behaviors*, 7(2), 133-142. Retrieved 06/01/07 from EBSCOhost database..
- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M., & Rossi, J. S. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, 59(2), 295-304. Retrieved 06/01/07 from EBSCOhost database.
- Frucht, S. S. (1999). *An application of the transtheoretical model of behavior change to the adoption of cholesterol-lowering behaviors by college students*. US: ProQuest Information & Learning.
- Graphpad, Software, (2005). *Quick calcs online calculators for scientists*. Retrieved on 05/05/08 from <http://www.graphpad.com/quickcalcs/ttest1.cfm?Format=SD>.
- Green, J. S., Grant, M., Hill, K. L., Brizzolara, J., & Belmont, B. (2003). Heart disease risk perception in college men and women. *Journal of American College Health*, 51(5), 207. Retrieved 06/01/07 from EBSCOhost database.

- Herrick, A. B., Stone, W. J., & Mettler, M. M. (1997). Stages of change, decisional balance, and self-efficacy across four health behaviors in a worksite environment. *American Journal of Health Promotion, 12*(1), 49-56. Retrieved 06/01/07 from EBSCOhost database.
- Huang, T. T. -, Harris, K. J., Lee, R. E., Nazir, N., Born, W., & Kaur, H. (2003). Assessing overweight, obesity, diet, and physical activity in college students. *Journal of American College Health, 52*(2), 83-86. Retrieved 06/01/07 from EBSCOhost database.
- Ma, J., Betts, N. M., & Horacek, T. (2001). Measuring stage of change for assessing readiness to increase fruit and vegetable intake among 18- to 24-year-olds. *American Journal of Health Promotion, 16*(2), 88-97. Retrieved 06/01/07 from EBSCOhost database.
- Ma, J., Betts, N. M., Horacek, T., Georgiou, C., White, A., & Nitzke, S. (2002). The importance of decisional balance and self-efficacy in relation to stages of change for fruit and vegetable intakes by young adults. *American Journal of Health Promotion, 16*(3), 157-166. Retrieved 06/01/07 from EBSCOhost database.
- Mann, L. (1972). Use of a 'balance-sheet' procedure to improve the quality of personal decision making: A field experiment with college applicants. *Journal of Vocational Behavior, 2*(3), 291-300. Retrieved 06/01/07 from EBSCOhost database.
- Marcus, B. H., Eaton, C. A., Rossi, J. S., & Harlow, L. L. (1994). Self-efficacy, decision-making, and stages of change: An integrative model of physical exercise. *Journal of Applied Social Psychology, 24*(6), 489-508. Retrieved 06/01/07 from EBSCOhost database.

- Marcus, B. H., & Owen, N. (1992). Motivational readiness, self-efficacy and decision-making for exercise. *Journal of Applied Social Psychology, 22*(1), 3-16. Retrieved 06/01/07 from EBSCOhost database.
- Marcus, B. H., Rakowski, W., & Rossi, J. S. (1992). Assessing motivational readiness and decision making for exercise. *Health Psychology, 11*(4), 257-261. Retrieved 06/01/07 from EBSCOhost database.
- Marcus, B. H., Rossi, J. S., Selby, V. C., & Niaura, R. S. (1992). The stages and processes of exercise adoption and maintenance in a worksite sample. *Health Psychology, 11*(6), 386-395. Retrieved 06/01/07 from EBSCOhost database.
- McArthur, L., Grady, F. M., Rosenberg, R. I., & Howard, A. B. (2000). Knowledge of college students regarding three themes related to dietary recommendations. *American Journal of Health Studies, 16*(4; 4), 177. Retrieved 06/01/07 from EBSCOhost database.
- Mulder, C. H., & Clark, W. A. V. (2002). Leaving home for college and gaining independence. *Environment and Planning, 34*(6), 981-999. Retrieved 06/01/07 from EBSCOhost database.
- National Cholesterol Education Program (2002), *National Heart, Lung, and Blood Institute, National Institutes of Health (NIH)* Publication No. 02-5215. Retrieved 04/30/07 from <http://www.nhlbi.nih.gov/guidelines/cholesterol/index.htm>
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion: AJHP, 12*(1), 38-48. Retrieved 06/01/07 from EBSCOhost database.



- Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice, 19*(3), 276-288. Retrieved 06/01/07 from EBSCOhost database.
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390-395. Retrieved 06/01/07 from EBSCOhost database.
- Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist, 47*(9), 1102-1114. Retrieved 06/01/07 from EBSCOhost database.
- Prochaska, J. O., Velicer, W. F., Guadagnoli, E., & Rossi, J. S. (1991). Patterns of change: Dynamic typology applied to smoking cessation. *Multivariate Behavioral Research, 26*(1), 83-107. Retrieved 06/01/07 from EBSCOhost database.
- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., et al. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology, 13*(1), 39-46. Retrieved 06/01/07 from EBSCOhost database.
- Rossi, S. R., Greene, G. W., Reed, G., Rossi, J. S., Prochaska, J. O., & Velicer, W. F. (1994b, April). Cross validation of a decisional balance measure for dietary fat reduction. Paper presented at the 14<sup>th</sup> annual convention of the Society for Behavioral Medicine, Boston, MA
- Rossi, S. R., Greene, G. W., Reed, G., Rossi, J. S., Prochaska, J. O., & Velicer, W. F. (1994c, April). Development of a self-efficacy questionnaire for dietary fat reduction. Paper presented at the 14<sup>th</sup> annual convention of the Society for Behavioral Medicine, Boston, MA

Select Survey, ASP Advanced, 8.1.6. (2004). *Atomic design, LLC company ClassApps.com.*

Retrieved 04/01/07 from [.http://www2.uwstout.edu/generalsurveys/Login.asp](http://www2.uwstout.edu/generalsurveys/Login.asp)

## Appendix A:

**Nutrition for Healthy Living  
FN-102 (2 credits)  
Spring 2007**

**Instructor:** Dr. Esther Glover Fahm, PhD, RD, CFCS  
**Office:** HE 342  
**Email:** fahme@uwstout.edu  
**Phone:** 232-2550 (office) or 232-2183 (department office)  
**Office Hours:** MW 2:00 p.m. – 3:00 p.m.; TTh 12:30 p.m.-2:30 p.m.; TTh 3:30 – 4:30 p.m.  
*Or by appointment*  
**Graduate Assistant:** Andrea Arvold (email: arvolda@uwstout.edu)

---

**Text:**

Brown, Judith E. Nutrition Now (4<sup>th</sup> edition). West Publishing, Minneapolis/St. Paul (Rental Resources).

**Course Description:**

The course description as stated in the Undergraduate Bulletin is as follows:

"Food selection and eating/patterns; standards, applied nutrition knowledge and interrelationships, nutrition information source analysis, weight management, the nutrition-exercise-fitness connection. Analysis of personal lifestyle and food patterns in relationship to optimal physical and mental well-being."

**Learner Outcomes:**

1. Demonstrate understanding of the importance of food selection habits as a prime determinant in healthy living and optimal health development.
2. Plan eating patterns consistent with optimum health, fitness, and wellness, which comply with current nutrition standards and guidelines.
3. Apply nutrition knowledge to specific healthy food choices, especially sources of calories, fat, fiber, and micronutrients.
4. Understand the important principles of energy balance, weight management, and the interactions of exercise and food intake in the attainment of a healthy lifestyle.
5. Appreciate that nutrition affects the quality of life throughout the human life cycle and affects not only the individual, but society as a whole.
6. Differentiate valid sources of nutrition information from fraudulent advice and quackery.
7. Make personal decisions regarding food and eating behavior consistent with nutrition, health, and optimal physical/mental well being.

**Course Requirements:**

1. Students are expected to attend all scheduled class sessions and to be on time.
2. Students are expected to read assigned chapters/class materials before class time.
3. Students are encouraged to ask questions and participate in class discussions.
4. Students are expected to be attentive in class and respectful of others. Please do not carry on conversations with other students or be otherwise disruptive during class time.
5. Class attendance policies in the Student Handbook (also printed in the 2004-2005 Timetable) will apply to this course. Regular attendance is the responsibility of each student, and it is assumed that all students will attend the classes for which they are registered. It is the student's responsibility to notify instructors of any situation that causes the student to miss class. Should the student be unable to reach an instructor, a message may be left with the department secretary.
6. **All assignments are due at class time on the assigned dates. Late assignments will be penalized 50% of points. Any late assignment must be submitted within 24 hours of the due date to be accepted.**
7. **Quizzes/exam must be completed at the scheduled class time. Any exceptions must be due to extenuating and verifiable circumstances.** Students are expected to notify the instructor in advance if they are unable to take quiz/exam at the scheduled time. Failure to do so may result in a grade of "zero" (F) for the quiz/exam. **Any missed quiz/ exam should be taken before the next class period.** You will be required to provide proper documentation to verify your circumstances for missing an exam. It is the student's responsibility to make arrangements with the instructor to take a missed quiz/exam.

8. **Assignments or coursework consisting of 2 or more pages must be STAPLED or bound together in a notebook. NO loose leaf sheets, paper clipped sheets or sheets turned down at corners are acceptable. Ten (10) points will be deducted from submissions that are not stapled or in binders.**
9. The instructor’s responsibility is to facilitate the learning process. Learning is, in the final analysis, the responsibility of the student. Make the most of this opportunity. See the instructor, ask questions/inform the instructor of your learning needs as necessary. You will get out of it what you put into it! The benefits you receive from this course will increase if:
  - a. You attend each class session.
  - b. You come to class prepared to think, ask questions and actively participate.
  - c. You read the assigned units before class.

**Disability:**

Persons with a disability or special learning needs should feel free to notify the instructor early in the course to maximize your learning experiences. Your disability will be accommodated according to the recommendations of Student Services.

**Course Evaluation: Requirements:**

6 quizzes at 30 points each .....	180 points
Vitamin & Mineral Quizzes (take home).....	100 points
Final.....	50 points
Required Assignments .....	150 points
My Pyramid (75 pts)	
Diet Analysis (75 pts)	_____
<b>TOTAL.....</b>	<b>480 points</b>

The tentative schedule for quizzes is given in the course outline. These dates may change. The instructor will announce dates for all quizzes in class at least one week prior to the date of the quiz.

Optional Activities—See course website at Learn@UW-Stout for a description of these activities:

Students will have an opportunity to complete optional assignments for extra credit. Optional assignments include in-class and out-of-class activities. They are intended to provide students with an opportunity to evaluate their nutrient intakes and to explore areas *not* covered in-depth in class. The points you earn for optional activities are treated as extra credit. No other extra credit opportunities will be available. **In-class optional activities can not be made up if missed. Late submissions will be penalized by 50% of points.**

**FN-102 Nutrition for Healthy Living**  
Tentative Schedule

Date	Tuesday	Thursday	Reading Assignment Unit in Text
1/23, 25	Course Overview Requirements/Expectations Pre-Test	Key Concepts in Nutrition and Terms	Units 1
1/29/31	Inside Story	What’s a Healthful Diet/Dietary Guidelines	Unit 2 & 6
2/6, 8	<b>Quiz 1</b> My Pyramid Food Guide My Pyramid Assignment Discussion	Understanding Food Labels/Additives, Organic Foods	Unit 4
2/13,15	Review Quiz Nutrition Attitudes and Behavior	How the Body Uses Food Digestion Video <b>Digestion Optional Activity</b>	Unit 5 & 7
2/20,22	<b>Quiz 2</b>	Carbohydrates: Useful Facts About	Units 3 & 12

	Ways of Knowing About Nutrition	Sugars, Starches and Fiber <b>My Pyramid Assignment DUE</b>	
2/26, 3/1	Carbohydrates: Dental Health and Diabetes	<b>Quiz 3</b> Alcohol Positives and Negatives— Guest Speaker (Tentative)	Units 12 & 13
3/6,8	Fat and Cholesterol	Nutrition & Heart Disease Fat Film Review Quiz 3	Unit 18 & 19
3/13, 15	<b>Happy Spring Break</b>	<b>Happy Spring Break</b>	
3/20,22	Protein & Amino Acids <b>Review Optional Assignment</b>	Vegetarian Diets <b>Review Diet Analysis Assignment</b>	Units 15 & 16
3/27,29	No Class---Advisement Day	<b>Quiz 4</b> Food Allergies/Intolerances	Unit 17
4/3,5	<b>Protein Optional Assignment Due</b> Dietary Supplements Review Quiz 4	Things to Know About Vitamins and Minerals	Units 20 & 23
4/10,12	<b>Vitamin/Mineral Quizzes DUE</b> Water—Sodium and Hypertension	<b>Quiz 5</b> Calories & Food Energy	Unit 25
4/17,19	Highs & Lows About Body Weight <b>Diet Analysis Assignment Due</b>	Weight Control Myths	Units 9 & 10
4/24,26	Eating Disorders—Guest Speaker (Tentative)	<b>Quiz 6</b> Diet and Cancer	Units 11 & 22
5/1,3	Multiple Dimensions About Food Safety Eating Disorders	Nutrition for Pregnancy, Breastfeeding, Infancy	Units 32 & 29
5/8,10	Nutrition for Growing Years: Childhood and Adolescence	No Class---Semester Ended	Unit 30
Exam/Post-Test: Tuesday, May 15 at 10:00-11:50 a.m.			

## Appendix B:

This research has been approved by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46.

### College Students' Health Status: Informed Consent Form

Mark Mittag & Katie Anderson

The purpose of this study is to investigate the dietary and physical activity status of college students. Your participation in this study is strictly voluntary and you may opt to end participation at any time. All information gathered will be used in data analysis. Throughout the study all information will be kept confidential. At the conclusion of the study any records that identify individual participants (e.g., email usernames) will be removed. You will be asked to fill out an on-line survey asking you questions about your dietary & physical activity habits, have your height, weight, % body fat, flexibility and strength measured in the Human Performance Lab on campus.\* You will be asked to complete the assessments twice, once now and again at week seventeen. No psychological harm is expected to occur to you as a result of participation in this study. Participants who complete all evaluations will be entered into a drawing to win cash incentives (\$200, \$100, \$50, \$30, or \$20). This incentive is not payment; it is a motivation to participate fully in this study. If you opt out of any data collection procedure, you will be forfeiting your eligibility for the drawing.

Any questions or concerns about this study should be directed first to the researchers, Mark Mittag, 715-505-6639, (mittagm@uwstout.edu), Katie Anderson, 218-750-0452, (andersonkati@uwstout.edu) or research advisor, Dr. Ann Parsons, Department of Biology, 203J Jarvis Hall-Science Wing, University of Wisconsin-Stout, 715-232-2563, or director of research services Sue Foxwell, 152 Voc Rehabilitation Building, 715-232-2477.

Participants must be 18 years or older to be included in this study. By completing the following on-line survey you are confirming that you meet the age requirement and agree to participate in the present investigation under the terms described here.

\*A single instrument called the Tanida Scale will be used to gather information on height, weight, BMI, and %Body Fat. Subjects will need to remove shoes and socks and step onto the scale platform. Results will be printed within 10 seconds. The original printed strip will be retained by the researchers, however if subjects are interested they will be informed of the values and it's meaning. Subjects will also complete a sit and reach test and a hand grip test to determine flexibility and upper body strength, respectively. The sit and reach test involves participant sitting on the floor with legs straight ahead of them. Feet are then placed with the soles flat against the instrument shoulder width apart. The participant's knees are held flat against the floor by the research assistant. Participants will have their hands on top of each other and their palms facing down, they will then reach forward along the ruler as far as possible. After three practice reaches, the fourth reach is held for at least two seconds while the distance is recorded by the research assistant. For the hand grip test, the subject holds the dynamometer in one hand in line with the forearm and hanging by the thigh. Maximum grip strength is then determined without swinging the arm.

### Demographic

1. Please enter your UW-Stout email username.\*

2. Please select all sections you are enrolled in.  
Select at least 1 response and no more than 4 responses.

- FN-102-001 T-Th, 12:20pm-1:15pm
- FN-102-002 M-W, 3:35pm-4:40pm
- BIO-111-001 Lab W, 8:00am-10:00am
- BIO-111-002 Lab W, 10:10am-12:10pm
- BIO-111-003 Lab W, 12:20pm-2:20pm
- BIO-111-004 Lab Th, 9:05am-11:05am
- BIO-111-005 Lab Th, 12:20pm-2:20pm
- BIO-111-006 Lab Th, 2:30pm-4:30pm
- SPCOM-100-004 M-W, 8:00am-8:55am
- SPCOM-100-020 M-W, 3:35pm-4:30pm
- SPCOM-100-023 M-W, 11:15am-12:10pm
- SPCOM-100-031 M-W, 8:am-8:55am
- ENGL-101 (All sections)

3. Have you ever been enrolled in FN-102 before this semester?

Yes  No

4. Gender

- Male
- Female

5. Age

Must be 18 years or older to continue with this study.

6. Smoker

- No, I am not a smoker.

Yes, I am a smoker. Please specify how many packs a week (numbers only)?

--	--	--	--	--	--

7. Class rank

Freshman  Sophomore  Junior  Senior  Graduate

8. Major

--

9. Ethnicity

Please check one.

	Hispanic	African-American	White Caucasian	Arab- American	Asian- American	Native American	Other
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Sports

Intramurals  
 Student Athlete  
 Other, please specify

--	--	--	--	--	--

11. Hours of paid work per week?

--

12. Hours of volunteering per week?

--



13. Hours of studying per week?

14. Residence

- On campus
- With parents or relatives
- Rental house or apartment
- Home owner
- Other, please specify

15. Weight

In pounds.

16. Height

Feet/Inches                      Feet                      Inches

17. Have you ever had your cholesterol checked?

- Yes  No

#### Determinants of Weight Change

18. Do you think that consuming a healthy breakfast, incorporating fruits/vegetables into your diet, and being physically active will help you not gain weight during your first semester as a freshman in college?

If you are not currently a freshman, was this the case when you were a freshman?

- YES
- NO

19. Has your weight changed in the past 6 months?

- YES, I have gained weight.  
 Yes, I have lost weight.  
 No

20. If your weight changed in the past 6 months, was this change on purpose?

- YES  NO

21. How many days per week do you eat breakfast?

For this survey, breakfast is defined as eating something within 2 hours of waking up.

- 0  1  2  3  4  5  6  7

22. When you eat breakfast, what do you eat most often for breakfast?

Please be specific and include drinks.

--	--

23. About how many servings of vegetables do you eat per day?

A serving of vegetables is 1/2 cup cooked/canned or 1 cup raw vegetables, 1/2 cup cooked/canned legumes (beans, lentils and peas), 1 cup raw leafy vegetables (ex. Lettuce, spinach).

- none  1  2-3  4-5  6-7  8 or more

24. About how many servings of fruit do you eat per day, not counting juices?

One serving equals: 1 medium piece of fresh fruit such as an apple, orange, or banana or 1/2 cup raw, cooked/canned or frozen, or 1/4 cup dried fruit (ex. Raisins, apricots, mango)

- none  1  2-3  4-5  6-7  8 or more

25. When you eat vegetables, how often are they cooked in butter, margarine, oil or lard?

- Always  Usually  Sometimes  Rarely  Never

26. How many servings of fruits & vegetables do you think a person should eat each day for good health?

Vegetables

Fruits

Servings

27. How would you rate your current consumption of both fruit & vegetables?

- Excellent
- Good
- Neutral
- Fair
- Poor

28. About how many hours per week do you spend in some type of physical activity?  
Physical activity is any activity you do during your leisure time instead of sitting around. Examples:  
Running, jogging, walking, weightlifting, bicycling, swimming, tennis, gardening, childcare, house  
cleaning, etc.

- none
- 1-2
- 3-5
- 6-8
- 9-11
- 12 or more

29. How would you rate your current level of physical activity?

- Excellent
- Good
- Neutral
- Fair
- Poor

30. Have you been thinking about becoming more physically active now that you are a college student?

- YES
- NO

31. Are you at all concerned about gaining the "Freshman 15" while in college?  
If you are not a freshman did you worry about it when you were a freshman?

- YES
- NO

### Stages of Change Estimation Sheet

For the next 3 items please check the box next to the statement that best describes your present position on adopting each behavior.

32. Do you consistently eat 5 servings of fruits and vegetables per day?  
 One serving equals: 1 medium piece of fresh fruit such as an apple, orange, or banana or ½ cup raw or cooked canned or frozen, ½ cup cooked or canned legumes (beans, lentils and peas), 1 cup raw leafy vegetables (ex. Lettuce, spinach), ¼ cup dried fruit (ex. Raisins, apricots, mango)
- No, and I do NOT intend to in the next 6 months.
  - No, but I intend to in the next 6 months.
  - No, but I intend to in the next 30 days.
  - Yes, and I have been, but for less than 6 months.
  - Yes, and I have been for MORE than 6 months.
33. Do you exercise regularly, that is, three or more times a week for 20 minutes or more at each time?
- No, and I do NOT intend to start exercising in the next 6 months.
  - No, but I am thinking about starting to exercise regularly in the next 6 months.
  - No I do not exercise regularly, but I do exercise some.
  - Yes, but I have been exercising regularly for LESS than 6 months.
  - Yes, and I have been exercising regularly for MORE than 6 months.
34. Do you consistently avoid eating high fat foods?  
 Consuming less than 30% of caloric intake from fat for a :1,600 calorie daily diet would be 53 grams of fat, for a 2,200 calorie diet the total would be 73, and for a 2,800 calorie diet the total would be 93.
- No, and I do NOT intend to in the next 6 months.
  - No, but I intend to in the next 6 months.
  - No, but I intend to in the next 30 days.
  - Yes, and I have been, but for LESS than 6 months.
  - Yes, and I have been for MORE than 6 months.



Please continue to ensure your eligibility to receive monetary incentives of up to \$200 (Odds are dependent on the number of participants who complete all data collection).

#### Self-efficacy Estimation: Fruits & Vegetables

Please check the box next to the answer that best fits your response to how likely you are to accomplish the action described in each statement when attempting to meet the FDA recommendation of consuming 5 servings of fruits and vegetables daily.

35. I can keep fruits and vegetables at hand and readily available.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

36. When I have the chance to choose, I can eat the recommended number of servings of fruits and vegetables.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

37. I can shop for a variety of fruits and vegetables.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

38. I can make time to eat fruits and vegetables.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

39. When I eat at home, I can eat more fruits and vegetables.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

#### Self-efficacy Estimation: Physical Activity

Please check the box next to the answer that best fits your response to how likely you are to exercise for 20 minutes a day/3 times a week when encountering the situation described in the following statements.

40. I am tired.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

41. I am in a bad mood.

- Very Unlikely
- Unlikely
- Neutral

- Likely
- Very Likely

42. I feel I don't have the time.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

43. When I am on vacation.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

44. When it is raining or snowing/too hot or cold.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

Please continue to ensure your eligibility to receive monetary incentives of up to \$200 (Odds are dependent on the number of participants who complete all data collection).



### Self-efficacy Estimation: Low-Fat Diet

Please check the box next to the answer that best fits your response in regards to how likely you are to consume less than 30% of your caloric intake from fat when encountering the situation described in the following statements.

45. While having a good time with friends at a party.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

46. When I have experienced a tough day and am not feeling good about myself.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

47. When it would be very difficult to substitute a low fat food because only high fat foods are available.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

48. In situations when I am celebrating with friends and happy.

- Very Unlikely
- Unlikely

- Neutral
- Likely
- Very Likely

49. During those times I feel myself depressed about something.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

50. In situations when eating a low fat food is just too much trouble.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

51. While eating out at a restaurant with close friends.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

52. On days when things are not going my way and I feel frustrated.

- Very Unlikely
- Unlikely
- Neutral

- Likely
- Very Likely

53. When substituting a low fat food for the high fat food I really want.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

54. While enjoying the company of others at a picnic or barbecue.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

55. When I have an argument with someone close to me and feel upset.

- Very Unlikely
- Unlikely
- Neutral
- Likely
- Very Likely

56. When I have to prepare meals for myself that are not high in fat.

- Very Unlikely
- Unlikely
- Neutral
- Likely

Very Likely

#### Decisional Balance Estimation: Fruits & Vegetables

Please check the box next to the answer that best fits your response in regards to how important each statement is to you in deciding whether or not to eat 5 or more servings of fruits and vegetables a day.

57. When in a hurry; including fruits and vegetables needs to be convenient.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

58. When I eat fruits and vegetables, I am doing something good for my body.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

59. It is difficult to find fruits and vegetables I like.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

60. Fruits and vegetables will add variety to my diet.

- Very Unimportant
- Unimportant

- Neutral
- Important
- Very Important

61. Shopping for fruits and vegetables would take up too much of my time.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

62. Eating one serving of fruits and vegetables when I am busy needs to be convenient.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

63. I need to know how safe fruits and vegetables are from chemicals.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

64. Eating foods like fruits and vegetables help me maintain my weight.

- Very Unimportant
- Unimportant
- Neutral

- Important
- Very Important

65. There are limited ways to incorporate fruits and vegetables into meals.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

66. There are a variety of ways to fix fruits and vegetables.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

67. Eating more fruits and vegetables will help me feel healthier.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

68. I purchase fruits and vegetables when "on sale".

- Very Unimportant
- Unimportant
- Neutral
- Important

Very Important

69. Having family and friends that eat fruits and vegetables.

Very Unimportant

Unimportant

Neutral

Important

Very Important

70. Fruits and vegetables are helpful when trying to loose weight.

Very Unimportant

Unimportant

Neutral

Important

Very Important

71. To buy more fruits and vegetables other foods would be purchased less.

Very Unimportant

Unimportant

Neutral

Important

Very Important

72. Storing fresh or frozen fruits and vegetables would take up more space.

Very Unimportant

Unimportant

Neutral

Important

Very Important

73. The recommendations for fruits and vegetables are too confusing.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

74. Eating more fruits and vegetables reduces the likelihood of getting sick.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

75. Having reasonably priced fruits and vegetables on campus, and in my local stores/produce markets.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

76. Getting nutrients from fruits and vegetables rather than taking supplements.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

You're almost there!



### Decisional Balance Estimation: Physical Activity

Please check the box next to the answer that best fits your response in regards to how important each statement is to you in deciding whether or not to engage in physical activity for 20 minutes a day/3 times a week.

77. I would have more energy for my family and friends if I exercised regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

78. Regular exercise would help me have a more positive outlook on life.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

79. I think I would be too tired to do my daily work after exercising.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

80. Regular exercise would help me relieve tension.

- Very Unimportant
- Unimportant
- Neutral

- Important
- Very Important

81. I would find it difficult to find an exercise activity that I enjoy that is not affected by bad weather.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

82. I would feel more confident if I exercised regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

83. I feel uncomfortable when I get out of breath and my heart beats very fast.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

84. I would sleep more soundly if I exercised regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important

Very Important

85. I would feel more comfortable with my body if I exercised regularly.

Very Unimportant

Unimportant

Neutral

Important

Very Important

86. Regular exercise would take too much of my time.

Very Unimportant

Unimportant

Neutral

Important

Very Important

87. I would feel good about myself if I kept my commitment to exercise regularly.

Very Unimportant

Unimportant

Neutral

Important

Very Important

88. I would have less time for my family and friends if I exercised regularly.

Very Unimportant

Unimportant

Neutral

Important

Very Important

89. I would like my body better if I exercised regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

90. At the end of the day, I am too exhausted to exercise regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

91. I would feel less stressed if I exercised regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

92. It would be easier for me to perform routine physical tasks if I exercised regularly.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

Keep going, less than 10 questions left!

## Decisional Balance Estimation: Low-Fat Diet

Please check the box next to the answer that best fits your response in regards to how important each statement is to you in deciding whether or not to consume less than 30% of your daily caloric intake from fat.

93. People think I am foolish for ignoring the warnings about eating foods that are too high in fat.
- Very Unimportant
  - Unimportant
  - Neutral
  - Important
  - Very Important
94. I am more content with myself when I am eating the high fat foods I enjoy.
- Very Unimportant
  - Unimportant
  - Neutral
  - Important
  - Very Important
95. Because I continue to eat foods high in fat, some people I know think I am neglecting my health.
- Very Unimportant
  - Unimportant
  - Neutral
  - Important
  - Very Important
96. Eating my favorite high fat foods is a quick way to satisfy my hunger.
- Very Unimportant
  - Unimportant

- Neutral
- Important
- Very Important

97. Other people are bothered by my eating a high fat diet.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

98. I am relaxed and therefore more pleasant to be with when free to eat foods high in fat.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

99. People close to me disapprove of my eating a diet which is too high in fat.

- Very Unimportant
- Unimportant
- Neutral
- Important
- Very Important

100. My family and friends like me better when I am happy and eating high fat foods rather than miserable and dieting.

- Very Unimportant
- Unimportant

- Neutral
- Important
- Very Important

Thank you for completing our survey! Please visit the Assessment Lab on 4th Home Economics building, room 427 to provide anthropometric measurements : M/8am-2:30pm/7:30pm-9:30pm, T/9am-9pm, W/9am-2:30pm, Th/8am-am-12pm). Remember to be eligible for monetary incentives you must ill data collection procedures (Odds are dependent on the number of who complete all data collection).

## Appendix C:



Research Services  
152 Voc Rehab Building

University of Wisconsin-Stout  
P.O. Box 790  
Menomonie, WI 54751-0790

715/232-1126  
715/232-1749 (fax)  
<http://www.uwstout.edu/rs>

**Date:** September 14, 2007

**To:** Mark Mittag  
Katie Anderson

**Cc:** Ann Parsons

**From:** Sue Foxwell, Research Administrator and Human  
Protections Administrator, UW-Stout Institutional  
Review Board for the Protection of Human  
Subjects in Research (IRB)

**Subject: Protection of Human Subjects**

Your project, "*College Students' Health Status: Readiness to Change and Weight Changes Associated with Dietary Intake in Freshman College Students*," has been approved by the IRB through the expedited review process. The measures you have taken to protect human subjects are adequate to protect everyone involved, including subjects and researchers.

**Please copy and paste the following message to the top of your survey form before dissemination:**

**This research has been approved by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46.**

This project is approved through September 13, 2008. Modifications to this approved protocol need to be approved by the IRB. Research not completed by this date must be submitted again outlining changes, expansions, etc. Federal guidelines require annual review and approval by the IRB.

Thank you for your cooperation with the IRB and best wishes with your project.

**\*NOTE: This is the only notice you will receive – no paper copy will be sent.**



## Appendix D:

*SOC and T Scores for the Pre-test Control*

<b>F &amp; V</b>	<b>Frequency Across SOC</b>						<b>T Score (SD)</b>			
	Sample	1	2	3	4	5	SE	DB-pro	DB-con	pro-con
Total	9	0	3	2	2	2	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	4.1 (9.4)
Male	3	0	1	1	1	0	48.1 (5.6)	51.7 (10.6)	49.8 (7.2)	2.0 (6.1)
Female	6	0	2	1	2	1	51.7 (12.1)	54.9 (6.9)	49.7 (9.3)	5.1 (11.1)
Fresh.	1	0	1	0	0	0	46.8 (----)	44.8 (----)	42.0 (----)	2.8 (---)
Sopho.	2	0	1	0	0	1	55.9 (12.9)	59.1 (6.8)	53.6 (8.8)	5.5 (15.6)
Junior	4	0	1	2	0	1	44.1 (9.1)	53.6(9.4)	51.8 (7.2)	1.7 (5.0)
Senior	2	0	0	0	2	0	59.6 (2.6)	53.6 (5.6)	45.6 (12.6)	8.0 (18.2)
<b>Fats</b>										
Total	9	1	1	2	1	4	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-.04 (8.4)
Male	3	1	0	0	0	2	43.2 (7.4)	44.6 (17.7)	46.1 (0.0)	-1.0 (17.7)
Female	6	0	1	2	1	2	51.9 (6.5)	48.2 (10.0)	48.3 (13.0)	-0.1 (7.1)
Fresh.	1	0	0	1	0	0	56.5 (----)	53.6 (----)	43.6 (----)	10.0 (---)
Sopho.	2	0	1	0	0	1	47.0 (8.3)	46.4 (20.2)	52.6 (23.7)	-6.2 (3.5)
Junior	4	1	0	1	0	2	45.4 (7.5)	44.1 (12.5)	42.7 (6.0)	1.0 (11.0)
Senior	2	0	0	0	1	1	57.4 (----)	50.0 (5.0)	52.6 (5.4)	-2.6 (0.4)
<b>PA</b>										
Total	9	0	0	2	1	6	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	3.7 (17.5)
Male	3	0	0	0	0	3	63.8 (3.8)	57.9 (0.0)	36.0 (0.8)	21.9 (13.9)
Female	6	0	0	2	1	3	42.3 (2.5)	50.2 (11.5)	55.6 (9.9)	-5.4 (13.8)
Fresh.	1	0	0	0	0	1	46.2 (----)	38.0 (----)	49.2 (----)	-11.2 (---)
Sopho.	2	0	0	1	0	1	41.3 (----)	57.1 (1.2)	66.9 (1.9)	-9.9 (0.8)
Junior	4	0	0	1	0	3	58.6 (10.9)	57.9 (0.0)	40.0 (8.0)	18.0 (8.0)
Senior	2	0	0	0	1	1	40.4 (1.2)	45.5 (17.6)	49.2 (9.7)	-3.7 (27.2)

*SOC and T Scores for the Pre-test Experimental*

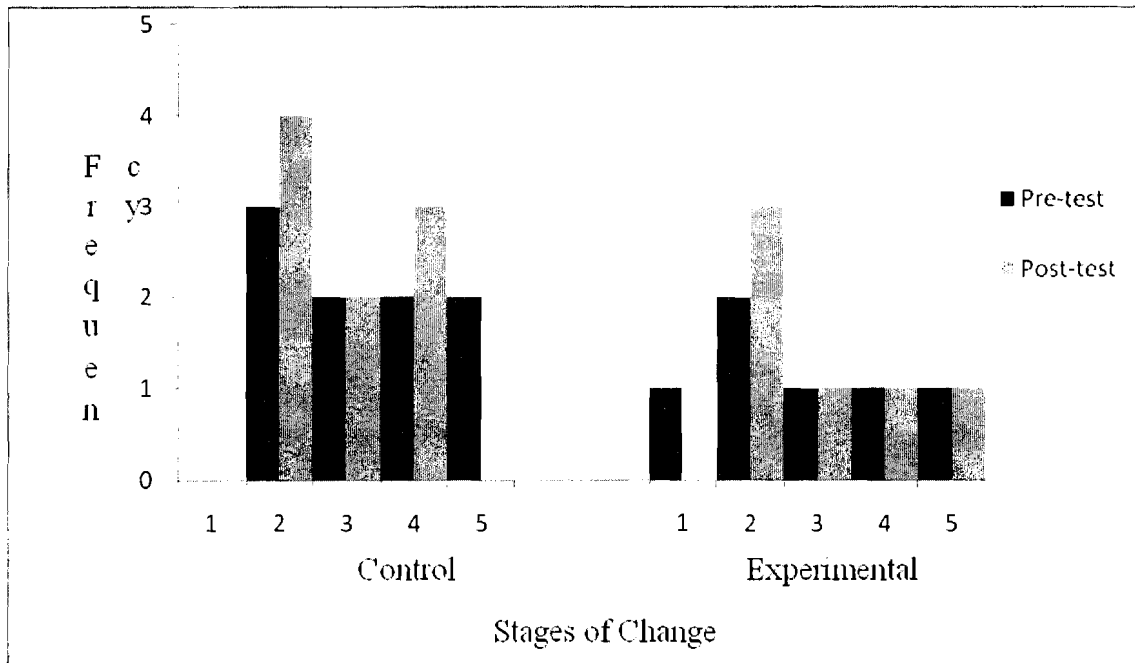
<b>F &amp; V</b>	<b>Frequency Across SOC</b>						<b>T Score (SD)</b>			
	Sample	1	2	3	4	5	SE	DB-pro	DB-con	pro-con
Total	6	1	2	1	1	1	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-6.1 (7.0)
Male	2	1	0	0	1	0	55.9 (7.7)	42.4 (7.9)	40.3 (5.0)	2.2 (2.9)
Female	4	0	2	1	0	1	45.9 (11.3)	45.2 (13.1)	55.4 (13.4)	-10.2 (3.3)
Fresh.	2	0	1	0	0	1	50.5 (15.4)	50.4 (19.1)	59.0 (18.9)	-8.6 (0.3)
Sopho.	1	1	0	0	0	0	50.5 (----)	36.8 (----)	36.7 (----)	0.1 (---)
Junior	2	0	0	1	1	0	48.7 (18.0)	41.6 (9.0)	43.8 (0.0)	-2.2 (9.0)
Senior	1	0	1	0	0	0	46.8 (----)	44.8 (----)	59.9 (----)	-15.1 (---)
<b>Fats</b>										
Total	6	1	1	1	0	3	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	0.6 (11.7)
Male	2	1	0	0	0	1	53.8 (5.1)	53.6 (----)	48.7 (3.6)	4.9 (3.7)
Female	4	0	1	1	0	2	50.8 (16.4)	53.6 (10.5)	55.2 (9.8)	-1.6 (14.3)
Fresh.	2	0	1	0	0	1	54.2 (27.6)	58.9 (12.6)	48.7 (10.9)	10.3 (1.8)
Sopho.	1	1	0	0	0	0	50.1 (----)	53.6 (----)	46.1 (----)	7.5 (---)
Junior	2	0	0	1	0	1	52.4 (7.1)	48.2 (7.6)	56.4 (7.3)	-8.2 (14.8)
Senior	1	0	0	0	0	1	47.4 (----)	53.6 (----)	61.6 (----)	-8.0 (---)
<b>PA</b>										
Total	6	0	2	1	0	3	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-6.2 (11.5)
Male	2	0	1	0	0	1	45.4 (1.2)	38.9 (3.5)	51.9 (1.9)	-4.4 (1.5)
Female	4	0	1	1	0	2	51.6 (10.3)	49.1 (9.7)	51.2 (6.2)	-2.8 (15.9)
Fresh.	2	0	1	0	0	1	52.0 (15.2)	45.5 (10.6)	54.0 (8.7)	-8.5 (19.3)
Sopho.	1	0	1	0	0	0	44.6 (----)	41.3 (----)	53.3 (----)	-12.0 (---)
Junior	2	0	0	1	0	1	45.4 (1.2)	36.4 (----)	48.5 (2.9)	-14.1 (14.8)
Senior	1	0	0	0	0	1	57.8 (----)	56.3 (----)	50.5 (----)	5.8 (---)

*SOC and T Scores for the Post-test Control*

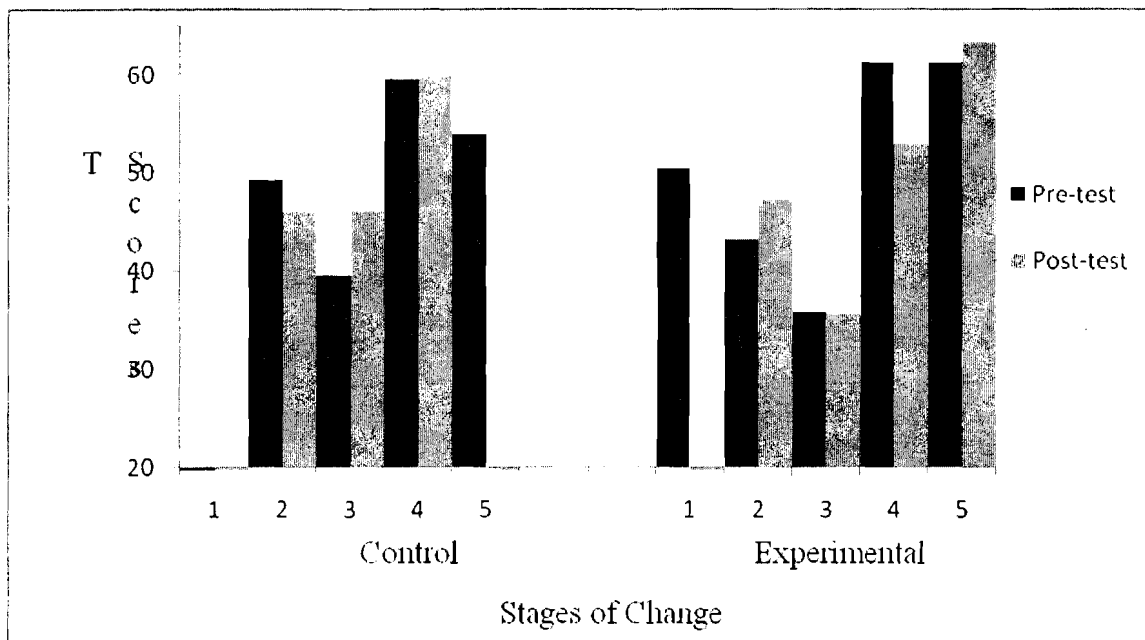
F & V	Frequency Across SOC						T Score (SD)			
	Sample	1	2	3	4	5	SE	DB-pro	DB-con	pro-con
Total	9	0	4	2	3	0	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	4.3 (13.7)
Male	3	0	1	1	1	0	50.7 (4.0)	52.7 (5.4)	38.7 (10.4)	14.1 (15.5)
Female	6	0	3	1	2	0	50.7 (12.0)	55.9(10.8)	53.8 (11.0)	-0.9 (14.1)
Fresh.	1	0	1	0	0	0	49.5 (---)	40.3 (----)	46.2 (----)	-5.9 (---)
Sopho.	2	0	1	0	1	0	58.2 (12.3)	61.7 (5.0)	59.2 (18.3)	2.5 (23.3)
Junior	4	0	2	1	1	0	46.1 (9.8)	54.5 (5.6)	44.6 (14.6)	9.9 (15.1)
Senior	2	0	0	1	1	0	53.0 (9.8)	00.0 (----)	47.8 (2.3)	0.0 (---)
<b>Fats</b>										
Total	9	1	2	1	0	5	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	4.6 (6.0)
Male	3	1	0	0	0	2	40.1 (8.0)	49.2 (19.6)	53.1 (2.1)	4.8 (4.8)
Female	6	0	2	1	0	3	55.8 (5.7)	51.1 (8.7)	46.6 (8.1)	4.4 (7.0)
Fresh.	1	0	0	0	0	1	54.5 (----)	41.8 (----)	30.8 (----)	11.0 (---)
Sopho.	2	0	1	0	0	1	00.0 (----)	49.2 (10.5)	50.1 (2.1)	-0.9 (8.3)
Junior	4	1	1	0	0	2	42.2 (7.7)	49.2 (16.0)	50.6 (4.6)	4.5 (3.9)
Senior	2	0	0	1	0	1	60.2 (0.7)	58.5 (7.9)	51.6 (0.0)	6.9 (7.9)
<b>PA</b>										
Total	9	0	0	2	1	1	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	5.3 (10.3)
Male	3	0	0	0	0	0	58.8 (11.5)	60.0 (0.0)	34.9 (0.0)	25.1 (0.0)
Female	6	0	0	2	1	1	44.2 (6.3)	50.9 (10.9)	55.5 (9.2)	-4.6 (12.8)
Fresh.	1	0	0	0	0	0	50.0 (----)	42.9 (----)	51.5 (5.3)	-8.6 (---)
Sopho.	2	0	0	0	1	1	47.4 (6.2)	60.0 (0.0)	61.3 (13.9)	-1.3 (13.9)
Junior	4	0	0	1	0	0	55.3 (11.7)	58.7 (2.6)	41.0 (12.1)	17.8 (14.6)
Senior	2	0	0	1	0	0	37.7 (5.0)	43.8 (15.7)	50.0 (8.5)	-6.2 (24.2)

*SOC and T Scores for the Post-test Experimental*

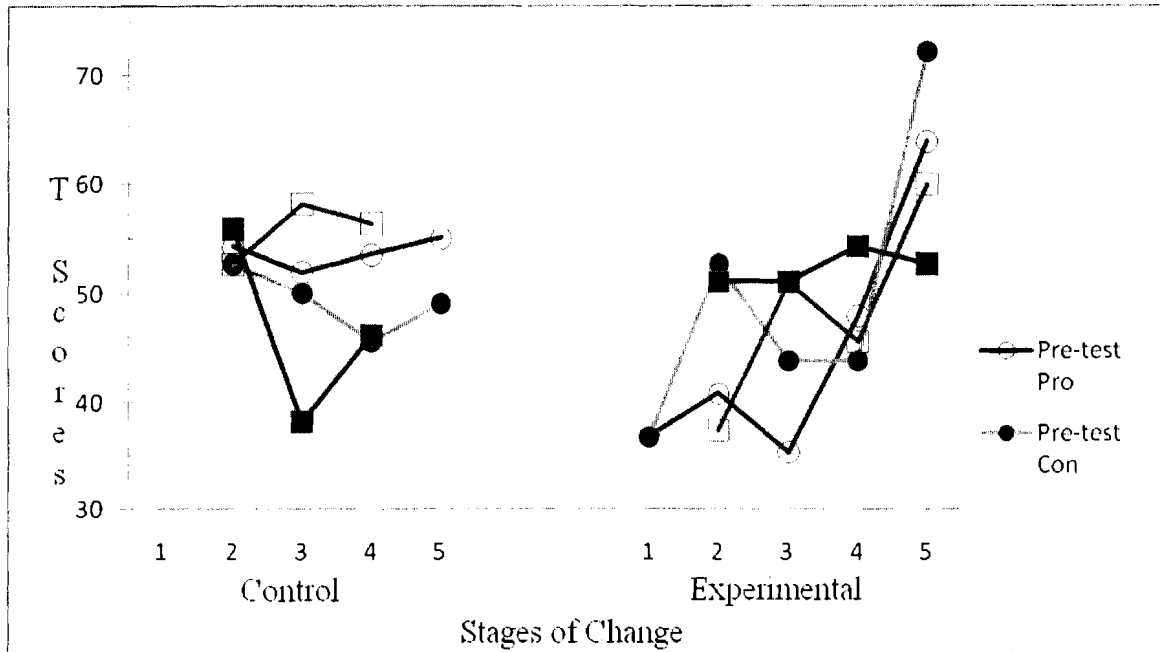
<b>F &amp; V</b>	<b>Frequency Across SOC</b>						<b>T Score (SD)</b>			
	Sample	1	2	3	4	5	SE	DB-pro	DB-con	pro-con
Total	6	0	3	1	1	1	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-7.2 (9.8)
Male	2	0	1	0	1	0	51.3 (2.5)	42.0 (5.0)	49.5 (6.9)	-7.4 (1.8)
Female	4	0	2	1	0	1	47.8 (14.3)	46.1(11.8)	53.1 (3.1)	-7.0 (12.6)
Fresh.	2	0	1	0	0	1	49.5 (19.7)	00.0 (----)	47.8 (2.3)	-5.4 (17.8)
Sopho.	1	0	1	0	0	0	49.5 (----)	38.5 (----)	44.6 (----)	-6.1 (---)
Junior	2	0	0	1	1	0	44.3 (12.3)	48.3 (3.8)	52.7 (2.3)	-4.4 (6.1)
Senior	1	0	1	0	0	0	56.5 (----)	40.3 (----)	57.5 (----)	-17.2 (---)
<b>Fats</b>										
Total	6	0	2	1	0	3	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-3.0 (12.3)
Male	2	0	1	0	0	1	53.0 (.7)	49.2 (10.5)	45.6 (8.4)	3.6 (2.1)
Female	4	0	1	1	0	2	50.1 (14.6)	49.2 (3.7)	57.6 (15.8)	-6.3 (14.4)
Fresh.	2	0	1	0	0	1	53.5 (18.9)	58.5 (7.9)	51.6 (0.0)	-0.6 (14.2)
Sopho.	1	0	1	0	0	0	53.5 (----)	41.8 (----)	39.7 (----)	2.1 (---)
Junior	2	0	0	1	0	1	52.5 (----)	51.1 (7.9)	60.5 (12.6)	-9.5 (20.5)
Senior	1	0	0	0	0	1	43.2 (----)	00.0 (----)	00.0 (0.0)	0.0 (---)
<b>PA</b>										
Total	6	1	1	1	0	3	50.0 (10.0)	50.0 (10.0)	50.0 (10.0)	-7.9 (11.6)
Male	2	0	1	0	0	1	50.9 (8.7)	41.2 (2.4)	53.0 (4.3)	-11.8 (6.6)
Female	4	1	0	1	0	2	51.8 (11.7)	45.5 (9.3)	51.5 (4.8)	-6.0 (14.0)
Fresh.	2	1	0	0	0	1	50.0 (17.3)	43.8 (15.7)	50.0 (8.5)	-8.5 (20.7)
Sopho.	1	0	1	0	0	0	44.7 (----)	42.9 (----)	50.0 (----)	-7.1 (---)
Junior	2	0	0	1	0	1	51.8 (7.4)	46.4 (9.7)	52.3 (5.3)	-5.9 (15.0)
Senior	1	0	0	0	0	1	60.5 (----)	41.2 (----)	53.0 (----)	-11.8 (---)



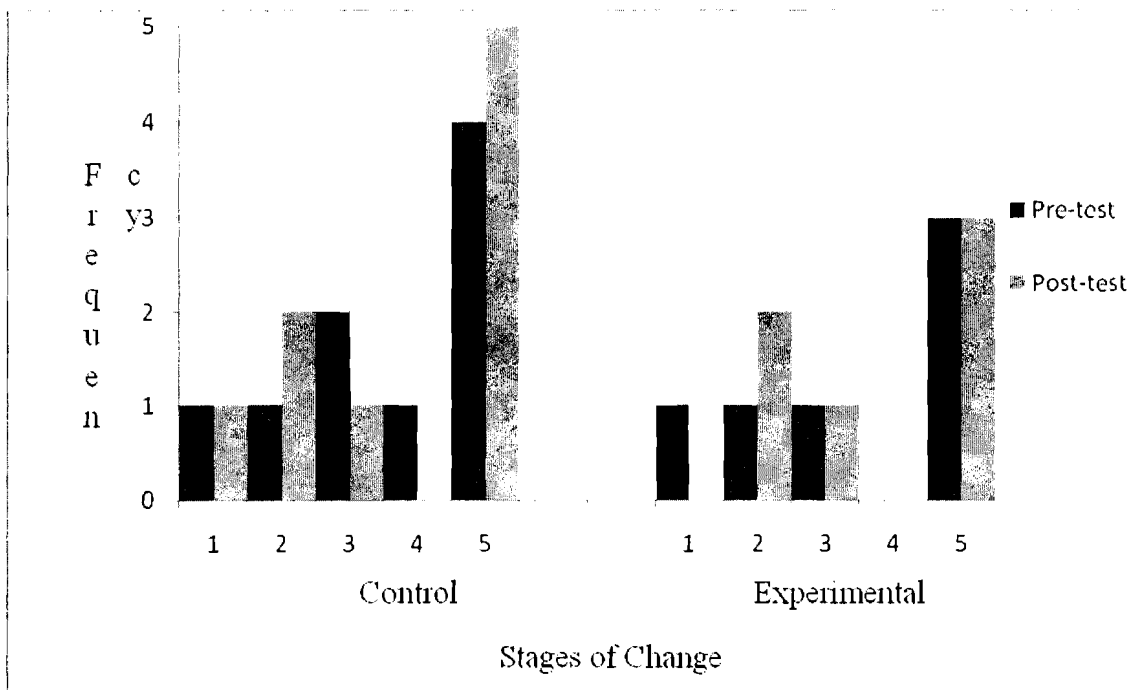
Distribution across SOC fruit and vegetable consumption.



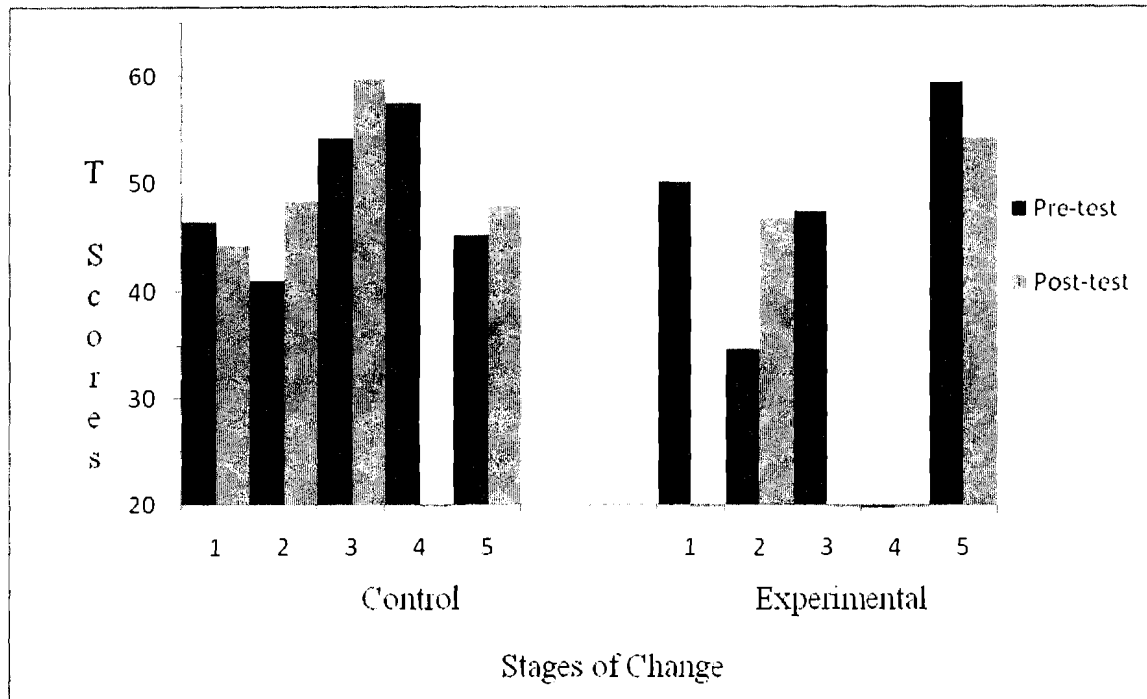
SE t-scores across SOC fruit and vegetable consumption.



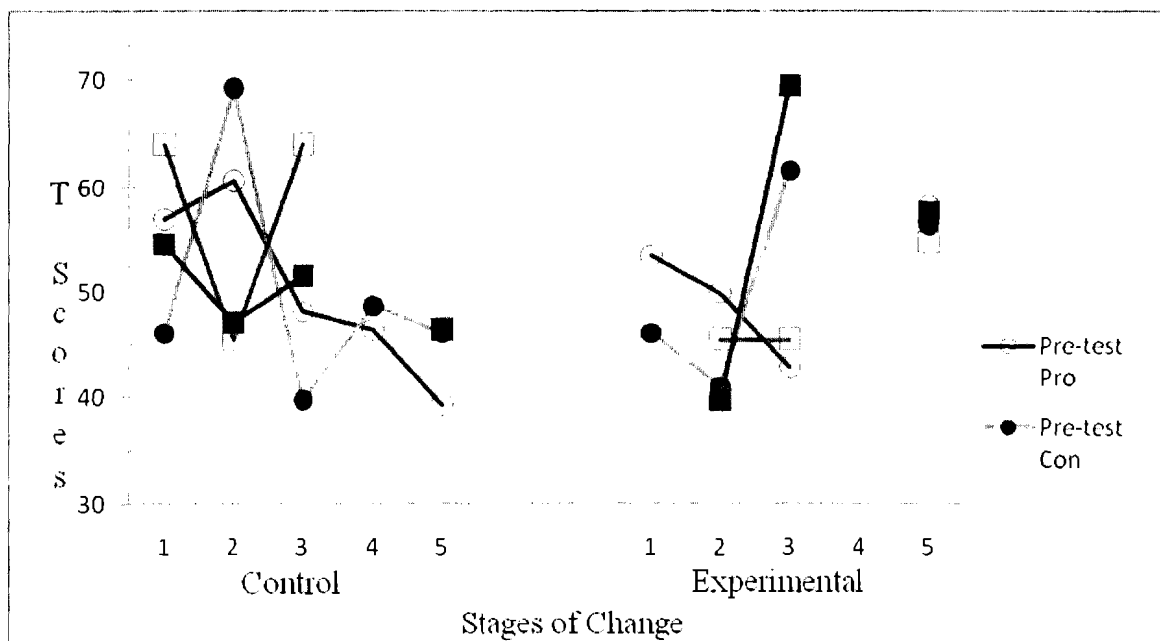
DB pros and cons for fruit and vegetable consumption.



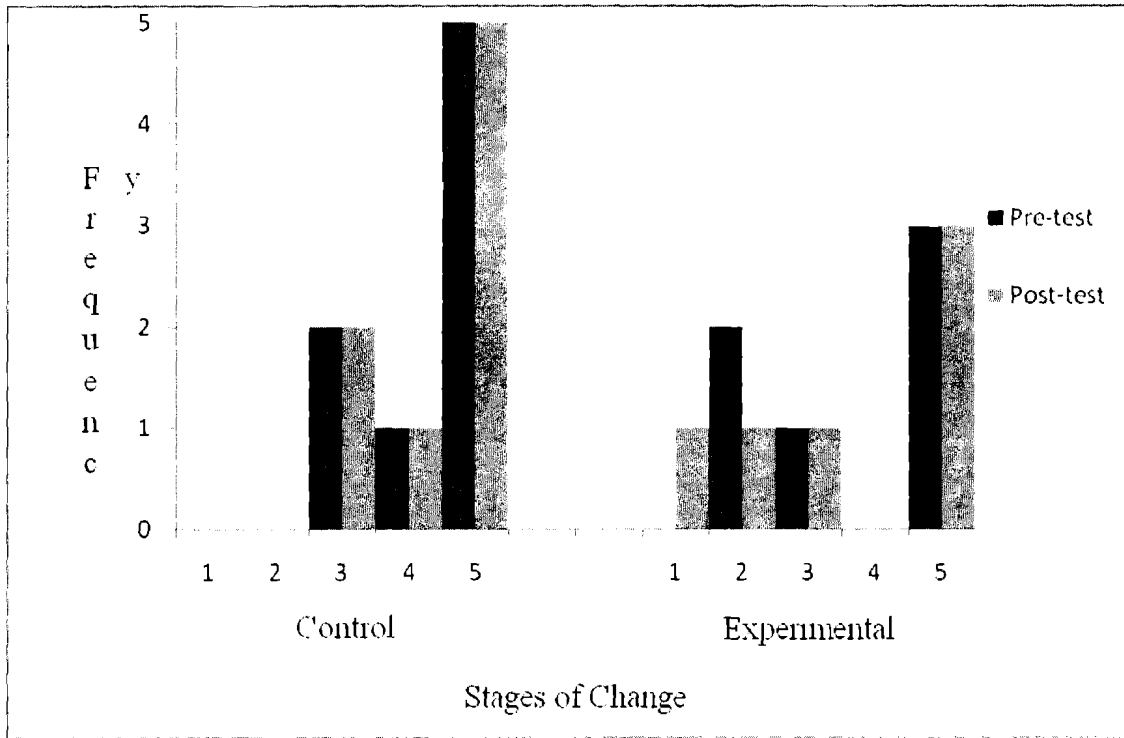
Distribution across SOC adherence to a low-fat diet.



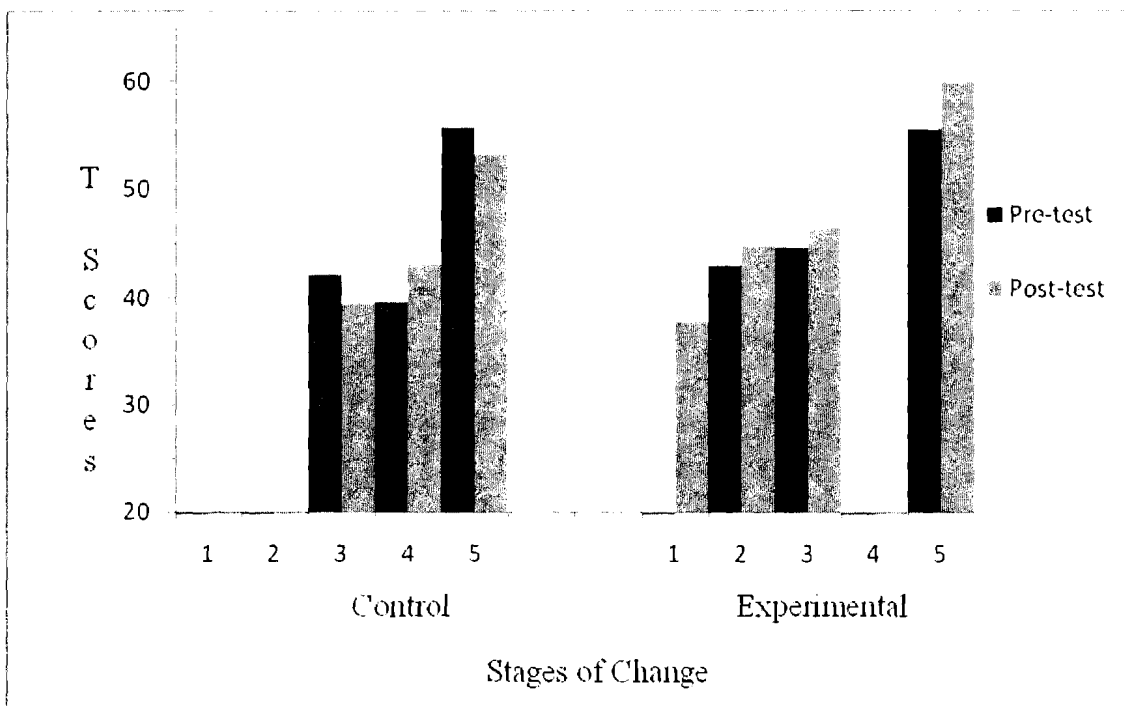
SE t-scores across SOC adherence to a low-fat diet.



DB pros and cons for adherence to a low-fat diet.

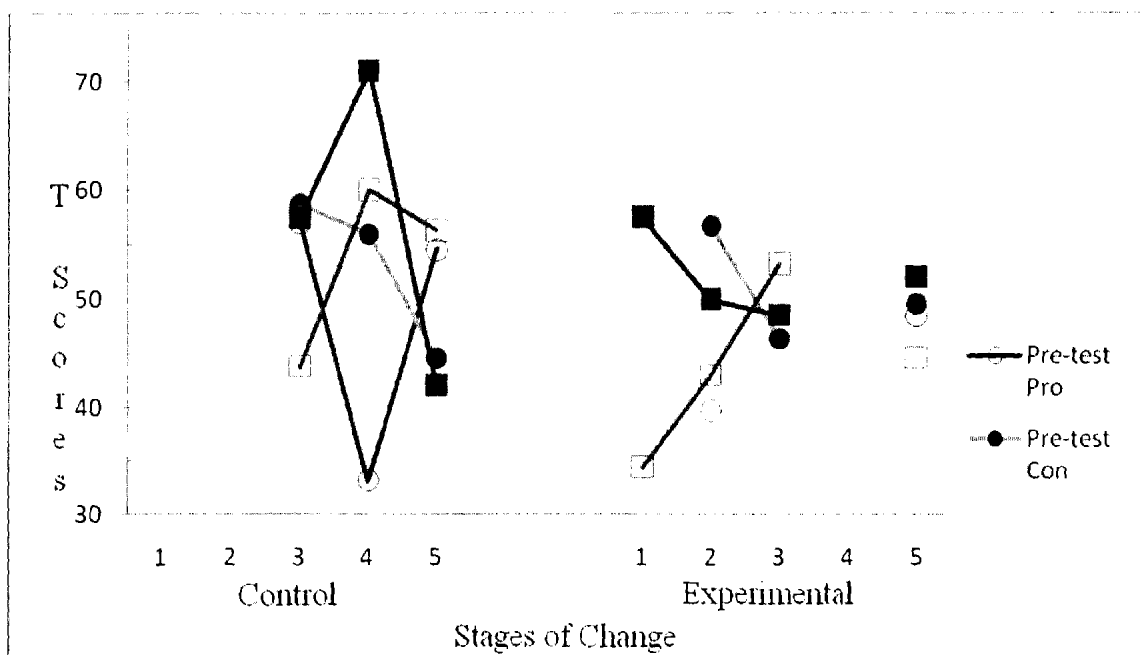


Distribution across SOC regular physical activity.



SE t-scores across SOC regular physical activity.





DB pros and cons for regular physical activity.