



Physical activity and its relationship to diet and attitudes toward body image
by Frank Edward Blakely

A thesis submitted in partial fulfillment of the requirements for the degree of Masters of Science in
Health and Human Development
Montana State University
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Abstract:

This study examined two hypotheses, 1) individuals who are more physically active demonstrate healthier dietary patterns than those who are less physically active, and 2) individuals who are more physically active demonstrate a less favorable attitude toward the image of other people's bodies than those who are less physically active. Data were collected using a mail-in survey from a random sample conducted in three states (Idaho, Montana, and Wyoming). A total of six communities, two from each state, were surveyed with approximately 575 surveys sent to each community. The response rate was 56%. Regression analysis revealed that there was a significant difference ($p < .05$) in dietary habits between those in the maintenance stage of physical activity (physically active for six months or more) and those in precontemplation (not currently active, and with no intention of starting), contemplation (not currently active, but considering starting within the next six months), and preparation (not currently active, but taking steps to become active within the next 30 days). Those in maintenance had a healthier diet. Additionally, women, older people, those with at least some college education, and those that were employed had healthier diets. This suggests that physical activity maybe a gateway behavior, a behavior that if adopted could lead to the adoption of other healthy behaviors. Only one stage of physical activity, precontemplation, was significantly different from the maintenance stage when considering attitude toward the image of other people's bodies, but the correlation was weak. These findings suggest that it may be possible to influence people to increase their level of physical activity by helping them to improve their diet, or vice versa.

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TOWARD BODY IMAGE

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MONTANA STATE UNIVERSITY-BOZEMAN
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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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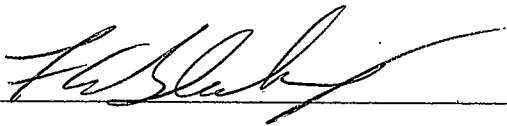
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ABSTRACT

This study examined two hypotheses, 1) individuals who are more physically active demonstrate healthier dietary patterns than those who are less physically active, and 2) individuals who are more physically active demonstrate a less favorable attitude toward the image of other people's bodies than those who are less physically active. Data were collected using a mail-in survey from a random sample conducted in three states (Idaho, Montana, and Wyoming). A total of six communities, two from each state, were surveyed with approximately 575 surveys sent to each community. The response rate was 56%. Regression analysis revealed that there was a significant difference ($p < .05$) in dietary habits between those in the maintenance stage of physical activity (physically active for six months or more) and those in precontemplation (not currently active, and with no intention of starting), contemplation (not currently active, but considering starting within the next six months), and preparation (not currently active, but taking steps to become active within the next 30 days). Those in maintenance had a healthier diet. Additionally, women, older people, those with at least some college education, and those that were employed had healthier diets. This suggests that physical activity maybe a gateway behavior, a behavior that if adopted could lead to the adoption of other healthy behaviors. Only one stage of physical activity, precontemplation, was significantly different from the maintenance stage when considering attitude toward the image of other people's bodies, but the correlation was weak. These findings suggest that it may be possible to influence people to increase their level of physical activity by helping them to improve their diet, or vice versa.

CHAPTER 1

INTRODUCTION

Much has been said about the health practices of Americans, most of it negative. Do Americans lead unhealthy lives? A cursory review in three topic areas, physical activity, food, and body image suggests that the answer is yes. For example, in 1997, 15% of the adult population of the United States engaged in regular physical activity (Office of Disease Prevention and Health Promotion (ODPHP), 2000) and 40% did not participate in any regular physical activity (ODPHP, 2000). Residents of Idaho, Montana, and Wyoming have high rates of inactivity. In Montana 25.2 % of the population reports no leisure-time physical activity, in Wyoming 21.1%, and in Idaho 20.4% (Centers for Disease Control and Prevention (CDC, 1999).

Over a 25-year period, Americans have increased their intake of sweeteners by 25%, to 154 pounds per capita (Putnam & Allshouse, 1999), decreased their overall milk consumption (Tippett & Cleveland, 1999), and few meet the recommended limits for fat and saturated fat intake (Tippett & Cleveland, 1999). Approximately 76% of adults report consuming fewer than five servings of fruits and vegetables per day as recommended by American Dietetic Association (CDC, 1999; Havas et al., 1994). In Montana and Idaho 76.2% of adults report consuming fewer than five servings of fruits and vegetables per day and in Wyoming the number is 78.8% (CDC, 1999).

These sedentary lifestyles and poor nutrition have contributed to obesity in the United States. In America, 33% of men and 36% of women are obese, as measured by body mass index (BMI) (CDC, 1997). In Montana and Wyoming 51.5% of adults are overweight and in Idaho the percentage is 53.1% (CDC, 1999).

These health findings paint a bleak picture of the health of Americans and the citizens of Idaho, Montana, and Wyoming in particular. Exacerbating these problems is the psychological experience that many suffer due to their size and shape (Crandall, 1994; Stunkard & Sobal, 1995). "Obese persons face a degree of social discrimination that is every bit as terrible as the medical sequelae of their fatness" (Yuker, Allison, & Faith, 1995).

Statement of the Problem

Based upon the information provided above, that is, that Americans tend to be sedentary, eat poorly, and are obese, two hypotheses were developed for this investigation. They are as follows:

- H_a #1: Individuals who are more physically active demonstrate healthier dietary patterns than those who are less physically active.
- H_a #2: Individuals who are more physically active demonstrate a less favorable attitude toward the image of other people's bodies than those who are less physically active.

Importance of the Problem

Increasing individual levels of physical activity and improving diet have long been challenging issues facing the health promotion community, which lends credence to the analysis of these two hypotheses. Previous research has examined the relationship between physical activity and other health behaviors (Costakis, Dunnagan, & Haynes, 1999; Kannel, 1967; U.S. Department of Health and Human Services (USDHHS), 1980; Wannamethee & Shaper, 1992) and in some cases a significant association existed (Blair et al., 1989; Shephard, 1989; Wankel & Sefton, 1994). The relationships that exist between physical activity and smoking, seat belt use, and stress management suggests the possibility that physical activity could be a gateway behavior. A gateway behavior is one that if adopted by an individual could enable them to adopt other healthy behaviors. It may be possible that by encouraging someone to become more active they may eventually seek to improve their diet, resulting in better nutrition.

I am not aware of any studies that have attempted to determine a relationship between an individual's level of physical activity and their attitude toward the image of other people's bodies. If there is an association, a new realm of possibilities will open for those involved in addressing obesity, physical activity, health promotion, and marketing (i.e., promoting products and services designed to help people stay healthy). Specifically, the environment that surrounds an individual as they attempt to develop a more physically active lifestyle could have significant impact on recruitment and adherence to that lifestyle. It may be that those who are less physically active are sedentary because of their perceptions of inferiority and alienation from those who are more active. This

perception may be caused by an environment created by the more physically active individuals viewing over fat newcomers as being lazy, stupid, or uncaring about their bodies. This atmosphere may affect the recruitment of sedentary individuals to a more active lifestyle due to the perceived unwelcome feeling when joining an exercise program. This may explain, in part, the poor recruitment and adherence to organized exercise programs (Carmody, Senner, & Manilow, 1980). If this is true, it may allow practitioners to create new ways to reduce the perceived barriers of the less physically active.

Definition of Terms

- Body image (others) – the physical or emotional reaction of one person toward another based on the other person's body size or shape
- Body image (self) – a person's mental image and evaluation of his or her physical appearance and the influence of these perceptions and attitudes on behavior (Rosen, 1995)
- Body mass index (BMI) – determined by dividing an individual's weight by the square of their height, it is an indicator of a person's weight in relation to their height. A BMI of <18.5 is considered underweight, $18.5 - 24.9$ normal, $25.0 - 29.9$ overweight, and ≥ 30 obese (Whitney & Rolfes, 1999)

- Fitness – a set of outcomes or traits that relate to the ability to perform physical activity (Caspersen, Powell, & Christenson, 1985)
- Gateway Behavior – a behavior that, if adopted by an individual, enables them to adopt other healthy behaviors
- Nutrition – for the purposes of this study, demonstrating healthy dietary habits as determined by a composite score from the cross-sectional survey (see Chapter 3)
- Physical activity – any bodily movement produced by skeletal muscles that results in energy expenditure (Caspersen et al., 1985)
- Stages of physical activity – self-reported, individual could select from five options:
 1) active for six months or more (maintenance), 2) active for six months or less (action), 3) not active now, but will start within 30 days (preparation), 4) not active now, but will start within six months (contemplation), and 5) not active now, and do not intend to start (precontemplation)

Delimitations

1. This study was limited to rural populations located in the states of Idaho, Montana, and Wyoming, specifically in the towns of American Falls and Preston, ID, Lewistown and Miles City, MT, and Powell and Torrington, WY. However, the respondents were the result of a random selection of adults, over the age of 18 years

old, living in these towns. Additionally, an over sample of Hispanics was selected for the towns with large Hispanic populations.

2. Measures used in this study were limited to the questions included in the survey (Appendix A).
3. Information on demographic characteristics was limited to those included in the survey (Appendix A).
4. The cross-sectional design of this study limited causal inference.

Limitations

1. The study was limited by the self-reported nature of the data.
2. The results are generalizable only to rural populations within the six towns surveyed.
3. There was a lack of racial diversity present in the study.
4. The September 11, 2001 attacks on the World Trade Center and Pentagon occurred the day after the introductory letter was sent to the subjects. The principal investigators decided that it would be unwise, and perceived as in poor taste, to mail the surveys during that week. Consequently, the survey packets were mailed approximately two weeks later. This delay in mailing may have affected the response rate. However, the response rate of 56% exceeded the research team's expectations.

CHAPTER 2

REVIEW OF LITERATURE

Much has been written about physical activity, food and nutrition, and body image, but very little has been written that considers all three variables simultaneously. These topics are under increased scrutiny as Americans attempt to discover ways to reduce mortality and morbidity.

In addition to explaining the background of this investigation, this chapter will also review the current literature as it relates to the applicable theories and models. Specifically, this chapter will discuss the Transtheoretical and Social Ecological Models, and physical activity, as a gateway behavior and as it relates to food and nutrition and body image.

Applicable Theories and Models

Transtheoretical Model

One theory that has found favor among many researchers for modifying or changing an individual's behavior is the Transtheoretical Model (TTM), or as it is sometimes known, the Stages of Change Model (Prochaska, 1979; Prochaska & DiClemente, 1982). Prochaska and DiClemente supposed that successful treatments were using the same concepts to create change in clients (Costakis, 1998; Prochaska & DiClemente, 1982). Their conclusions suggested five processes of change and the

concept of stages of change (Prochaska & DiClemente, 1982). Their analysis of 18 principal therapies was synthesized into the *Transtheoretical Model* (Prochaska & DiClemente, 1982). This model, originally developed to work with addictive behaviors, that is, smoking, suggests that an individual makes a change in lifestyle by progressing through a series of steps, or stages. This model has been expanded to include a variety of behaviors, including alcohol use, seat belt use, and exercise (Costakis et al., 1999; Marcus, Selby, Niaura, & Rossi, 1992; Unger, 1996). The basic premise is that change occurs on a continuum as opposed to a single event (Prochaska, Velicer, DiClemente, & Fava, 1988). The six stages are defined as:

Precontemplation – The person is not engaged in the appropriate health behavior and is not planning to change the behavior in the foreseeable future (Prochaska, DiClemente, & Norcross, 1992; Prochaska & Velicer, 1997a). In this stage an individual may enjoy a sedentary lifestyle and or have poor dietary habits because of convenience. They maybe in this stage because they do not know the consequences of their action (or inaction) or they do not realize the severity of their current behavior (Prochaska & Velicer, 1997a). Usually this is interpreted to mean that the individual will not start the behavior within the next six months and is characterized by the phrase “I won’t” (Costakis, 1998; Reed, Velicer, Prochaska, Rossi, & Marcus, 1997).

Contemplation – In this stage the individual begins to consider a change in lifestyle, but has not taken any steps to initiate the change. The individual has become aware of “the problem” and is considering action to alter his or her lifestyle (Prochaska & Velicer, 1997a). During this stage an individual may realize that their sedentary lifestyle

is unhealthy, or that their diet is contributing to the poor results on a recent physical examination. Generally, this means that the person intends to take action within six months, but contemplators can remain in this stage for extended periods of time due to their ambivalence as they weigh the costs and benefits of changing the behavior (Prochaska & Velicer, 1997a). This is the "I might" stage (Reed et al., 1997).

Preparation – This occurs when the person intends to begin changing their behavior (i.e., they have initiated action to start the appropriate health behavior), usually within the next month (Prochaska & Velicer, 1997a). This is the "I will" stage (Reed et al., 1997). For example they may have signed up with a health club or bought personal athletic equipment. Although they have started movement toward changing their lifestyle, they have not achieved the requirements of the action stage (Costakis, 1998).

Action – This is the "I am" stage (Reed et al., 1997). Here the individual has changed their behavior. They have modified their environment, behavior, or experiences in order to initiate the appropriate behavior (Costakis, 1998; Prochaska et al., 1992). This stage occurs when the person has achieved the criterion measurement (e.g., started a regular physical activity program or adopted a more healthy diet). This phase is the most unstable stage and most prone to relapse (Prochaska & Marcus, 1994). Individuals remain in this stage, as long as they meet the criterion measurement, usually from zero to six months (Prochaska & Marcus, 1994).

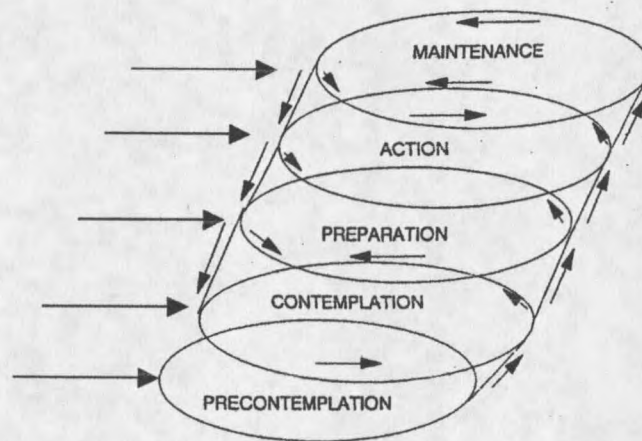
Maintenance – The "I have" stage describes a person who has met the criterion measurement, typically for at least six months (Reed et al., 1997). They are, however, still subject to relapse, but they do not apply change processes (see below) as often as

those in action (Prochaska & Velicer, 1997a). This stage would include the person who begins an exercise program, and consistently maintains their program over the next year. This period may last longer for some people than others, depending on the health behavior they are attempting to change (Costakis, 1998).

An interesting, and complicating facet of the TTM is that an individual can enter the model at any stage and then move in either direction (i.e., toward action and maintenance or back toward precontemplation) (Rehor, McNeill, Moon, & Brock, 1996). Generally, it is assumed that an individual progresses through change linearly, from not performing a behavior to performing it. As can be seen graphically in Figure 1, according to the TTM, this is not the case. A person could enter the model in preparation, or even in action and then either progress to action or maintenance, or digress to contemplation or precontemplation. Children often grow up in a home where healthy dietary habits are the norm (maintenance), but once on their own they may be attracted to more fast and junk food (contemplation or precontemplation) and completely forget the lessons learned at home. The dynamic and idiosyncratic process of progression through the stages complicates any intervention, as the practitioner must not only encourage change, but also assist in maintaining any progress that the individual has already made.

Processes of Change. In addition to the "stage" construct, the TTM also includes several other constructs that influence the application of this model in the health promotion environment. The first of these are the ten processes of change, which describe stage specific techniques that can be applied to move an individual through the

FIGURE 1. Transtheoretical Model of Behavior



(Rehor et al., 1996)

stages of change (Prochaska, Redding, & Evers, 1997; Prochaska & Velicer, 1997b). (See Table 1.) Of interest is how these processes are applied across the various stages. Depending on which stage an individual is in, they can apply, or accept, an intervention aimed at a particular process (Table 1 charts the processes of change and their relationship to the stages of change). For example, an individual in precontemplation would be susceptible to a “dramatic relief” intervention such as role-playing or a media campaign, either of which could evoke an emotional response (Prochaska & Velicer, 1997b). “Self-reevaluation” applied to one in contemplation might include value clarification, role modeling, or imagery techniques (Prochaska & Velicer, 1997b). Those in preparation would be receptive to the concepts of “self-liberation”, such as advocacy programs, empowerment, and policy changes (Prochaska & Velicer, 1997b). Individuals

Table 1. The processes of change, a construct of the Transtheoretical Model, and examples of their application as part of an intervention toward people in the stages indicated.

Stage	Process	Definition
Precontemplation	Consciousness Raising	Greater consciousness about the causes, costs, and cures for a specific problem behavior.
	Dramatic Relief	Affective aspects of change, often involving intense emotional experiences related to the problem behavior.
	Environmental Reevaluation	Consideration and assessment by the individual of how the problem behavior affects their physical and social environment.
	Social Liberation	Realizing that the social norms are changing in the direction of supporting the healthy behavioral change.
Precontemplation & Contemplation	Self-Reevaluation	Emotional and cognitive reappraisal of values by the individual with respect to the problem behavior.
Preparation	Self-Liberation	The individual's belief and commitment to change the problem behavior.
Action & Maintenance	Contingency Management	Provides consequences for taking action in a particular direction.
	Helping Relationships	Trusting, accepting, and utilizing the support of caring others during attempts to change the problem behavior.
	Counterconditioning	Substitution of alternative behaviors for the problem behavior.
	Stimulus Control	Control of situations and other causes, which trigger the problem behavior and adding prompts that encourage the alternative behavior.

Adapted from (Prochaska & Velicer, 1997b; Samuelson, 1998)

in action and maintenance need interventions that will support them continuing the healthy lifestyle habits that they have adopted. "Helping relationships" would provide

this support through rapport building, counseling, and buddy systems (Prochaska & Velicer, 1997b).

Decisional Balance. A third construct of the TTM is that of decisional balance, that is, the positive and negative aspects of changing a behavior (Velicer, DiClemente, Prochaska, & Brandenburg, 1985). This construct considers how the individual perceives the benefits (pros) and costs (cons) of adopting a new behavior. Marcus, et al. (1994) found that individuals who perceived exercise as a benefit (e.g., feel better, feel healthier, more energy) demonstrated a greater readiness to change their behavior and adopt exercise. On the other hand, those who saw only the costs (e.g., soreness, tired, lack of time) were less likely to adopt exercise in their lives.

Prochaska and Velicer (1997) found that precontemplators identified more negative reasons (cons) for not adopting a behavior than positive (pros). The number of pros increased as the individual moved through contemplation to action, while the number of cons remained the same to contemplation and then lowered toward action. What this means from a practical standpoint is that an intervention designed for an individual in precontemplation must focus on increasing the number of pros, for example presenting all the reasons why an exercise program or healthy diet would be beneficial (Prochaska & Velicer, 1997b). To move the individual to action, the number of cons must decrease, that is the barriers to adopting an exercise program, or healthy diet, must be reduced.

Self-Efficacy. The fourth construct is that of self-efficacy. Self-efficacy, an individual's self-confidence to perform a behavior in a specific situation, is one of the

most studied aspects of the TTM (Prochaska & Velicer, 1997b; Rodgers, Courneya, & Bayduza, 2001). Self-efficacy measurements can show differences between stages, with those in latter stages demonstrating higher self-efficacy scores (Marcus et al., 1992).

This means that in order for an individual to move from contemplation to preparation and action, they must feel confident in their ability to change, that is adopt the new lifestyle.

In a recent study, individuals were staged based on their readiness to increase their consumption of fruits and vegetables. The researchers found the greatest increase in self-efficacy expectations occurred between preparation and action. This indicates that individuals might benefit from an educational intervention designed to increase their level of self-efficacy (Brug, Glanz, & Kok, 1997). This finding added depth to the research of Marcus et al. (1992) who reported that individuals in each stage demonstrate different levels of self-efficacy.

Social Ecological Model

Dr. Daniel Stokols outlined the constructs for the Social Ecological Model, which attempted to address the interaction between individuals and groups and their environment. This model evolved from biology and has been applied in several disciplines such as sociology, psychology, and public health and provides a framework for understanding how people interact with their physical and sociocultural environment (Stokols, 1992). The model is composed of four primary constructs that include:

- 1) factors in the physical and social worlds affect the well-being of individuals,
- 2) any analysis of health must address the environment,
- 3) people can be studied at different levels, and
- 4) concepts obtained from systems theory are used to understand the

interaction between people and their surroundings. These constructs are explained in greater detail below.

The Physical and Social Worlds Affect the Well-Being of Individuals. Several factors present in the physical (e.g., geography, weather) and social environments (e.g., traditions, public policy) influence the well-being of individuals. Individual well-being is also affected by personal attributes, psychological temperament, and behavioral patterns. This means that the health promotion must take into account the interaction between environmental and personal factors (Stokols, 1987).

For example, an individual who works in an environment that does not support discretionary time may be hard pressed to find sufficient time to adopt a regular exercise program. Likewise, an individual would find it difficult to implement a healthier diet if his/her spouse did not support the action.

Health Analysis Must Address the Environment. Any analysis of health and/or health promotion must deal with the intricacies of the environment. Environment is defined as a collection of independent conditions (e.g., lighting, group size, or social climate). In other words, environments can be defined in terms of their physical or social components, actual or perceived traits, or their immediacy to the group or individual (Stokols, 1987).

Obese individuals may find the environment at health clubs to be cold or threatening. Simply encouraging them to join the club is not enough to overcome this intimidating environment. Individual times, special facilities, appropriate

instructors/staff, or unique programs may be required in order for these individual to feel comfortable enough to join.

People Can be Studied at Different Levels. Participants in an environment can be studied at a variety of levels, from individuals to large organizations or entire populations. This model uses multiple levels (e.g., surveys, observations, secondary data analysis) of analysis to assess the health and well-being of participants and groups. The assumption made is that health promotion programs can be improved by coordinating the efforts of individuals and groups at different levels. Encouraging individuals to select healthy lifestyle behaviors while helping corporate leaders to establish health-related policies supporting a community plan that implements healthy living standards would be an example of this coordination (Stokols, 1987).

Systems Theory is Used to Understand Interactions Between People and Environments. The social-ecological model includes several concepts from systems theory, these being interdependence, homeostasis, negative feedback, and deviation amplification (Stokols, 1992). These concepts are used to understand the interactions between people and their environments. Much like reciprocal determinism, these interactions are characterized by mutual influence, where the physical and social characteristics of a situation have an effect on the individual's health and, simultaneously, the individual modifies their environment through their actions (Baranowski, Perry, & Parcel, 1997; Stokols, 1992).

If an obese individual begins a fitness program, but notices that everyone is staring at him, he may perceive that they disapprove of his size. This may lead him to

curtail his exercise program, with a subsequent gain in weight, resulting in even more stares of perceived disapproval. Likewise, if an individual were to begin eating healthier, and receive encouragement from a spouse or significant other, that person is more likely to continue the behavior.

In the past, research on health behaviors has been separate from investigations into the environment, but these four constructs highlight the influence of the environment on any health promotion strategy (Stokols, 1987). It also means that when an intervention is planned, environmental implications must be identified, since they are likely to impact on either the individual or the larger group (Stokols, 1987).

Stokols (1992) also recognized the diversity of environmental situations and suggested that the relationships between conditions and health would be mixed and even conflicting. He realized that the potential health benefits of a physical environment might be for naught if the interpersonal relationships are dysfunctional. Likewise, a supportive interpersonal situation may allow members to cope with a less than desirable environmental circumstance (Stokols, 1987).

Physical Activity

Gateway Behavior

There have been several efforts made to determine if there is a link between physical activity and other health behaviors (Blair, Jacobs, & Powell, 1985; Costakis et al., 1999; Kannel, 1967; USDHHS, 1980; Wannamethee & Shaper, 1992). The goal of these labors was to determine if physical activity was a gateway to other healthy lifestyle

behaviors, and the results of some researchers have supported this hypothesis (Blair et al., 1985; Costakis, 1998; Shephard, 1989; Wankel & Sefton, 1994). For example, Costakis (1998) showed an association between physical activity and decreased cigarette use, increased seat belt use, and better stress management practices. However, no relationship was found between physical activity and alcohol consumption (Shephard, 1989). Shephard (1989) suggested that inadequate measurement techniques or masking, created by the close association of physical activity to the other behaviors being studied could be responsible for these mixed results. Although encouraging, it is apparent from the current literature that more research is needed to establish a causal link between physical activity and other health behaviors.

Food and Nutrition

Few studies have specifically examined the relationship of physical activity as a gateway behavior to the consumption of nutritious foods (Wilcox, King, Castro, & Bortz, 2000). One study did explore this concept. A sample of 350 adults over the age of 50 were assessed over a one-year period to determine if their dietary habits changed based upon their level of physical activity. One group received an exercise intervention while the other did not. The researchers concluded that while dietary changes did occur, there was no relationship between physical activity and dietary change, that is there was no association between an increased level of physical activity and a change in diet (Wilcox et al., 2000). However, additional research is needed to see if these findings are consistent using other means of physical activity and diverse settings (e.g., rural and frontier).

Body Image

The research concerning body image has been almost universally directed at how individuals perceive their own body, although some research has explored children's attitudes toward other people's bodies (Cash & Roy, 1999; Caskey & Felker, 1971). The children studies were designed to determine the cultural influences on children's attitudes toward body image. The investigators found that ectomorphic body shapes (i.e., slender) were interpreted as belonging to individuals who were seen as honest, happy, pretty, smart, kind, and helpful (Caskey & Felker, 1971). Those with endomorphic body shapes (i.e., fat) were seen as lazy, lonely, sloppy, ugly, mean, dirty, and stupid (Caskey & Felker, 1971).

While there were a multitude of studies stating that physical activity levels contribute to body weight management (American College of Sports Medicine, 1998; USDHHS, 1996), there were none that found a relationship between the perception of another person's body image and an individual's level of physical activity. This is surprising in that virtually all body image research recognizes the growing dissatisfaction that Americans have with their own body image (Cash & Henry, 1995; Cash, Winstead, & Janda, 1986; Feingold & Mazzella, 1998; Garner, 1997). It would seem a concern for exercise/weight researchers and practitioners that those who are satisfied with their body image would develop a condescending attitude toward those they consider fat. This negative attitude, due to the belief that body weight, a key component of image, is controllable, develops despite the strong evidence that body weight is biogenetically proscribed (DeJong & Kleck, 1986; Lewis, Cash, Jacobi, & Bubb-Lewis, 1997). This

“looking down” could manifest in the actions of those that are satisfied, resulting in shunning those who are not. The result could be an even greater sense of dissatisfaction by those who do not measure up to the cultural standard. Their greater sense of dissatisfaction could lead to even less physical activity in an effort to avoid the “looks” of others. However, additional research is needed to support this hypothesis.

Summary

In this study, the premise is that an individual's stage of physical activity may be an entry point for improving food and nutrition habits and developing positive attitudes about the image of other people's bodies. Valid and reliable algorithms exist for determining an individual's stage of physical activity (Reed et al., 1997). With a person's stage identified it may be possible to identify the best program or materials to provide them in order to change their dietary habits or to influence how they see and react to others.

Americans do not eat the recommended daily allowance of fruits and vegetables, dairy products, or fat (CDC, 1999; Tippet & Cleveland, 1999). If there is a link between an individual's stage of physical activity it would provide practitioners with a new and different way in which to motivate healthy lifestyle changes in those who currently do not eat healthy. By targeting messages based on the processes of change for physical activity it may be possible to influence people to adopt food and nutrition habits that more closely match the dietary recommendations.

A variety of models, theories, and marketing techniques have been used in an attempt to increase the level of physical activity among Americans. Most have met with failure, approximately 50% of individuals who join any kind of exercise program dropout during the first six months (Carmody et al., 1980; Dishman, 1988). While this is probably due to a diverse set of reasons, it may be possible to create more conducive environments for increasing physical activity if participants and non-participants recognize the implications of their roles in the environment. If the physically active understand that their attitudes affect the perceptions of the non-physically active they may be able to guard and even change their outlook toward the less physically active. Also, by analyzing an individual's stage of physical activity it may be possible to identify challenges and/or discriminatory actions and develop techniques for overcoming these issues. Likewise, there may be potential for managers of wellness facilities to develop niche programs that would provide a comfortable atmosphere in which the less physically active can begin their transition to greater physical activity.

CHAPTER 3

METHODOLOGY

Genesis Of The Investigation

This investigation was conducted under the auspices of the Wellness in the Rockies (WIN the Rockies) project. This U.S. Department of Agriculture funded project conducted both educational and research activities at the individual and community level. (Award number 0004499 through the Initiative for Future Agriculture and Food Systems (IFAFS) Competitive Grants Program.) (The guiding principals for this project are shown in Appendix B.) As a component of the WIN the Rockies project this study set out to determine if there was a relationship between an individual's level of physical activity and their dietary patterns, or between their level of physical activity and their attitude about the image of other people's bodies.

Data

Human Subjects Committee Approval

A request was submitted to the Montana State University Human Subjects Committee on June 29, 2001. The Committee was provided the purpose of the research as well as a detailed description of the investigation procedures. Participation was voluntary and the Committee approved the research design and procedures.

Sampling Framework And Subjects

The sampling framework was a random sample, provided by Genesys, conducted in three states (i.e., Idaho, Montana, and Wyoming). A total of six communities, two from each state, were surveyed with approximately 575 households per community. An additional 350 surveys were sent to three of the communities in order to over sample their Hispanic populations. Hispanics were over sampled in both communities in Idaho and one community in Wyoming to insure a representative Hispanic portion of the surveys were returned. The goal was to survey a minimum of 500 individuals in each community; the additional 75 surveys per community were designed to compensate for the incorrect addresses that were anticipated. The surveys were to be completed by an adult (18 years or older) who lived in the house and had the most recent birthday.

Instrumentation

The Survey. A 57-item questionnaire, consisting of four sections, was designed to gather information for this investigation (Appendix A). The four sections were: 1) food and nutrition, 2) physical activity, 3) body image, and 4) demographic and socioeconomic information.

For the purposes of this study, the questions used were developed, or adapted, by ~~WIN~~ the Rockies investigators in coordination with an advisory group of health and nutrition specialists and professors. A significant number of the questions (questions 1-4, 6, 7, and 12) were taken from the Behavioral Risk Factor Surveillance Survey (BRFSS). The BRFSS was established in 1984 by the Centers for Disease Control and Prevention

(CDC) (CDC, 2001). The purpose of the system was to gather health risk behavior data on a statewide, rather than nationwide, basis. The CDC designed a core of questions that states could use for comparison.

Two questions (questions 10 and 11) were adapted from the Food Behavior Checklist (Kristal et al., 1990). This checklist was developed to provide a simpler means for gathering dietary habit information than the 24-hour diet recall method. It contains 19 yes/or questions about the kinds of food eaten during the preceding day. Since these questions were modified from the original format the validity and reliability results of the original research cannot apply.

Another question (question 21) dealt with the respondent's stage of physical activity. This question was adapted from research conducted by Norman, et al. (1998) and Marcus, et al. (1992) (Cancer Prevention Research Center, 2002). This question was however, modified from the original, and measurements of validity and reliability of the original question cannot apply.

Questions 33 and 40 were from the Antifat Attitudes Test (Lewis et al., 1997). The Pearson r values for the Antifat Attitudes Test questions ranged from -0.02 to $+0.19$ (by gender and compared to five other instruments) providing proof of validity. Reliability values (α) were 0.87 and 0.91 (female and male, respectively).

The remaining questions (5, 8, 32, and 38) were developed for this study. The investigation team and advisory group reviewed these questions to ascertain face and content validity. Face validity is a judgment decision based upon the knowledge and expertise of the researchers, in other words does this question make sense (Neuman,

2000)? Content validity, a different form of face validity, attempts to determine if the full content of the definition is represented by the question.

The survey consisted of four 8-½ in. x 17 in. pieces of paper stapled together in booklet style to create eight 8-1/2 in. x 11 in. pages (Appendix A). The first page was a cover letter that explained several topics including the following: 1) how the data would be used, 2) that participation was voluntary, 3) who would have access to the data, and 4) what to do once the survey was completed.

Piloting. The purpose of the pilot was: 1) to determine if respondents understood the questions (i.e., terminology, directions, meaning, clarity), 2) evaluate the survey (i.e., length and readability), and 3) to assess the presentation of the survey (i.e., envelope, cover letter, incentive).

The survey was piloted over the course of two days among 20 residents of a rural Montana town with comparable socioeconomic characteristics to that of the survey communities. These characteristics included total population of less than 5,000, major sources of income (i.e., agriculture), and source of healthcare (i.e., availability and type of medical care).

Two methods were used during the piloting process, cognitive (or concurrent) and retrospective interviewing (Dillman, 2000). Both of these methods were designed to verify that subjects understood and could answer the questions. The cognitive method entails asking respondents to answer each question out loud, in the presence of the interviewer. The goal was to determine how questions were being interpreted and whether the intent of each question was being conveyed.

In the retrospective method, the respondent was asked to complete the questionnaire as if they had received it at home and the interviewer was not present. As the respondent completed the survey, the interviewer watched for hesitation, expressions, and erasures - anything that might indicate that the subject was having difficulty with the instrument. After the respondent completed the questionnaire, the interviewer asked questions about the observations (e.g., hesitations) made during the process.

As a result of the pilot, several changes were made to the questionnaire. First, it was suggested that a local doctor, as opposed to a university professor, sign the introductory letter. Second, the survey cover letter should spell out "Wellness in the Rockies". Many respondents thought the term "WIN" made the survey appear to be an unwanted sweepstakes application. Third, attach a note to the incentive (each survey included one dollar) explaining its purpose and possible uses (e.g., keep or donate to a charity of their choice). Fourth, several questions were reworded to account for regional differences (e.g., soda pop vs. soft drink), add missing options (e.g., single person response to family eating habit questions), or to clarify definitions. A complete report of the piloting process and the recommended changes are in Appendix C.

Survey Packet And Distribution

Survey Packet. The survey packet consisted of a cover letter, the questionnaire, a self-addressed return envelope, and a one-dollar incentive (either a new bill or a Sacajawea coin).

Distribution. Prior to mailing the survey packet, an introductory letter, signed by a high profile community doctor was mailed to each subject. The intent was to mail these letters two to three days prior to mailing the survey packet. Unfortunately, the letters were mailed September 10, 2001, the day before the World Trade Center/Pentagon attacks. The principal investigators decided that it would be unwise, and perceived as in poor taste, to mail the surveys during that week. Consequently, the survey packets were mailed approximately two weeks later.

Two weeks after the survey mailing, respondents received a postcard reminder that thanked them for their participation and asked them to insure that they mail in their survey. Approximately four weeks after the surveys were mailed, a telephone follow-up was made to everyone who had been mailed a survey. The individuals were asked if they had completed the survey, and if yes, were thanked. If they had not completed the survey they were asked to do so. They were also asked if they still had the original survey or if they needed another. Through this effort an additional 81 surveys were mailed. It is important to note that not everyone was contacted during this telephone follow-up. Many received a message on their answering machine while others, without a machine, received no additional contact after the postcard reminder.

Statistical Analysis

The goal of this study was to discover if there was a relationship between an individual's stage of physical activity and either their dietary habits or their attitude toward the body image of others. Select socioeconomic variables were included as

control variables due to their suspected relationship to physical activity. Diet and attitude toward other's bodies were the dependent variables of interest in this analysis.

Descriptive statistics were used to gain a general appreciation of the data. Frequencies and percent distributions were determined by gender for age, race, education, BMI, employment, income, and stage of physical activity. Missing data was replaced by imputation using the mean of the variable in question (see Appendix D, Table 14). Descriptive statistics, in the form of cross tabulations, were also performed on the dependent variables as explained below. The intent of this process was to compare the survey respondents to the general population (through Census data) and to identify any unique characteristics of the sample.

Dependent Variables

The dependent variables were diet (H_a #1) and body image attitude (H_a #2).

Diet. The diet variable was determined by a composite score that was arrived at through an evaluation of responses to 11 survey questions. These questions addressed the frequency of consuming salads, potatoes, carrots, other vegetables, sweetened beverages, vegetable or fruit juices, fruit, soft drinks (soda pop), fiber, cereal, and "super-sized" portions (questions 1 – 8 and 10 – 12). The questions are shown in Appendix A.

The questions were divided into four categories, fruits and vegetables (questions 1 – 4, 6, and 7), sweetened drinks (5 and 8), whole grains (10 and 11), and portion control (12). Each question was scored on a Likert scale from 0 - 4/5, depending on the number of possible responses. Several questions (2, 5, 8, and 12) were reverse coded so

that scoring would be consistent (i.e., lower values indicated a less healthy diet while higher values signified a healthier diet). An examination of the questions resulted in the following range of scores, 1) 0 – 30 fruits and vegetables, 2) 0 – 10 sweetened drinks, 3) 0 – 10 whole grains, and 4) 0 - 4 portion control. The total range was 0 – 54. A reliability analysis was conducted to insure that the questions were correlated with one another, Cronbach's α was determined .7041 for the fruits and vegetables questions, .3912 for the sweetened drink questions, and .4565 for the whole grain questions (see Appendix D, Tables 15 - 17).

In order to cross tabulate the data for descriptive purposes, an analysis of each question resulted in a definition of "healthy" diet. This definition was based upon the assumption that an individual who indicated that they consumed food from a particular food group at least 2 – 4 times per week was achieving the recommended dietary goals. (In some cases, such as sweetened drinks, this logic was reversed, that is, they consumed sweetened drinks less than once a week.) For fruits and vegetables a score of 24 or above was consider healthy and ≤ 4 unhealthy; the scores for sweetened drinks was >8 and ≤ 4 ; for whole grains >8 and ≤ 4 ; and for portion control >3 and ≤ 2 . This resulted in a total of >43 , that is, any score above 43 was considered healthy and below 22, unhealthy. Those scores in between, 33 – 43, were labeled as average.

Body Image Attitude. The analysis of the questions concerning the subject's attitude toward other people's bodies was carried on in a manner similar to that of the diet questions. Four questions addressed the issue of how the respondent thought about the image of other people's bodies (questions 32, 33, 38, and 40). These questions are shown

in Appendix A. A reliability analysis was conducted to insure that the questions were correlated with one another, Cronbach's α was determined to be .4758 for the four questions (see Appendix D, Table 18).

Two of the four attitude questions (38 and 40) were reverse coded to insure consistent scoring, and a total range of 1 – 20 was determined. For descriptive purposes, a "positive" attitude toward other people's bodies was determined to be a score of ≥ 16 , with a score < 8 being a "negative" attitude. This interpretation was based upon the concept that in order to have a positive attitude toward other people's bodies the individual would have to indicate that they agreed or strongly agreed with the question (questions 32 and 40 were reverse scored and the subjects were required to disagree or strongly disagree). For example see questions 32 and 33 below. Scores between 8 and 15 were labeled as neutral.

32. Many different shapes and sizes of human bodies can be attractive.

- | | |
|---|---|
| ☐ Yes, I strongly agree | 5 |
| ☐ Yes, I agree | 4 |
| ☐ No, I disagree | 2 |
| ☐ No, I strongly disagree | 1 |
| ☐ I neither agree nor disagree | 3 |

33. I prefer not to associate with people who have excessive fat.

- | | |
|---|---|
| ☐ Yes, I strongly agree | 1 |
| ☐ Yes, I agree | 2 |
| ☐ No, I disagree | 4 |
| ☐ No, I strongly disagree | 5 |
| ☐ I neither agree nor disagree | 3 |

Stage. One question was asked to determine the subject's stage of physical activity (question 21). The question, and its interpretation, was as follows:

21. Using the definition at the beginning of question 20 (actively moving 30 minutes or more each day), which of the following best describes you? Mark one box (X).

- ☐ I'm physically active and have been so for more than 6 months (MAINTENANCE = 1)
- ☐ I'm physically active and have been so for less than 6 months (ACTION = 2)
- ☐ I'm not physically active now but plan to start within in the next 30 days (PREPARATION = 3)
- ☐ I'm not physically active now but plan to start within the next 6 months (CONTEMPLATION = 4)
- ☐ I'm not physically active now and don't plan to start (PRECONTEMPLATION = 5)

Independent Variables

The independent variables used in the regression models included: gender, age, race, education, BMI, employment, and income. These variables are further described below:

- PA = Stage of physical activity (Maintenance = 1, Action = 2, Preparation = 3, Contemplation = 4, Precontemplation = 5)
- GENDER = Gender (Male = 0, Female = 1)
- AGE = Age group (ranging from 18 - 99)
- RACE = Race (Other = 0, White = 1)
- ED = Highest level of education achieved (High School Diploma or Less = 0, Some College = 1, College Graduate = 2)
- BMI = Body mass index (range from 12.4 – 65.3)
- EMP = Employment situation (Other = 0, Employed = 1, Retired = 2)

INC = Total household income ($< \$30,000 = 0$, $\geq \$30,000 = 1$)

Linear Regression

A linear regression analysis was conducted using SPSS (SPSS, 2000) to determine if stage of physical activity predicted either a better diet or a poor attitude toward other people's bodies (i.e., to prove or disprove either hypotheses). The socioeconomic covariates were added to the analysis to determine if stage of physical activity predicted diet and attitude while controlling for these other variables.

Significance was determined at the .05 level of confidence.

The variables used in the following regressions were based upon the composite scores developed above. The empirical models used in this study are identified below:

$$\text{DIET} = \beta_0 + \beta_1\text{PA} + \beta_2\text{GENDER} + \beta_3\text{AGE} + \beta_4\text{RACE} + \beta_5\text{ED} + \beta_6\text{BMI} + \beta_7\text{EMP} + \beta_8\text{INC} + \varepsilon$$

$$\text{ATT} = \beta_0 + \beta_1\text{PA} + \beta_2\text{GENDER} + \beta_3\text{AGE} + \beta_4\text{RACE} + \beta_5\text{ED} + \beta_6\text{BMI} + \beta_7\text{EMP} + \beta_8\text{INC} + \varepsilon$$

ε = Error term

CHAPTER 4

RESULTS

A total of 3,245 surveys were circulated via the U.S. Postal Service to the citizens of six towns in the states of Idaho, Montana, and Wyoming. The response rate was 56%, based upon the return of 1,817 surveys. An analysis of the results of the survey are presented below, first by demographic and socioeconomic characteristics, second by descriptive statistics for physical activity and both dependent variables (i.e., diet and attitude), and third by statistical analysis, specifically linear regression.

Demographic and Socioeconomic Characteristics

Over 40% of the subjects were above the age of 60 years old (male = 40.8%, female = 45.5%) and most had completed some college (male = 62.4%, female = 57.6%) (see Table 2). Reports of BMI indicated that 1.6% of the sample were underweight (male = .9%, female = 2.3%), 32.8% were in the "normal" range of 18.5 – 24.9 (male = 28.3%, female = 37.4%), 40% were in the overweight range of 25.0 – 29.9 (male = 46.9%, female = 32.9), and over 25% were >30 and classified as obese (male = 23.9, female = 27.4). In total, 65.6% of the respondents were overweight or obese. More than 56.2% of the respondents were employed (male = 63.1, female = 49.0), but over 34% were retired (male = 31.9, female = 36.3). The complete frequency

distribution of respondents' selected demographic and socioeconomic characteristics are shown, by gender, in Appendix D, Table 19.

Table 2. Selected demographic and socioeconomic characteristics of survey respondents.

VARIABLE	MALE ¹	FEMALE ¹	TOTAL
AGE (mean 56.5 yrs) (std dev 17.74)			
<30 years	6.2 ²	8.7 ²	7.4 ²
30 – 39 years	11.0	11.2	11.1
40 – 49 years	21.0	16.8	18.9
50 – 59 years	21.0	17.9	19.4
60+ years	40.8	45.5	43.1
All	50.4	49.6	100.0
EDUCATION			
High School or Less	37.6	42.5	40.1
Some College	37.8	39.2	38.4
College Degree	24.6	18.4	21.5
BMI			
<18.5	0.9	2.3	1.6
18.5-24.9	28.3	37.4	32.8
25.0-29.9	46.9	32.9	40.0
≥30	23.9	27.4	25.6
All	50.4	49.6	100.0
EMPLOYMENT			
Employed	63.1	49.0	56.2
Retired	31.9	36.3	34.1
Other	5.0	14.8	9.2
All	50.4	49.6	100.0

Table notes:

1. For males n = 916, for females n = 901.

2. Numbers reported are as a percentage of that gender.

A comparison was conducted between survey results and Census data. While gender was comparable to the general population of each state and community (males = 46.1 – 49.0% from Census data and 48.3 – 53.5% from the survey; females = 51.0 – 53.9% from Census data and 45.6 – 51.7% from the survey), there were two areas that were different (U.S. Bureau of Census, 2000). Specifically, 39.7 – 47.9 % of the respondents reported their age as over 60, as compared to approximately 15.7 – 27.6% of the general population (see Table 3). In all cases the survey data recruited substantially more respondents over the age of 60 than the Census results. The table of comparisons between survey results and Census data for the variables of interest (gender, age, race, education, employment, and income) is shown in Appendix D, Table 20.

Also, an underreporting of low-income (i.e., < \$10,000) individuals was found (U.S. Bureau of Census, 1990). Specifically, 5.4 – 10.7% of the survey respondents were in this category, while Census results indicated that 16.3 – 24.1% were classified into this category. In all cases the survey data recruited substantially fewer low-income respondents than the Census results.

Table 3. A comparison of selected survey results to Census data in each state and community¹.

Survey (S)		Idaho				Montana		Wyoming		
Census Data (C) ²		ID	Preston	American Falls	MT	Lewis-town	Miles City	WY	Powell	Torrington
AGE										
20 – 24	S	4.0	6.0	2.0	2.2	2.5	1.9	2.9	2.3	3.4
	C	7.3	7.5	6.1	6.5	4.6	5.7	6.4	10.7	5.9
25 – 34	S	11.6	15.1	8.3	8.1	6.0	10.4	8.3	12.4	4.1
	C	13.1	12.3	12.9	11.4	9.2	10.9	12.4	10.8	10.0
35 – 44	S	13.5	14.1	12.9	13.1	12.9	13.3	14.6	12.1	17.2
	C	14.9	11.8	12.0	15.7	14.0	15.0	16.1	11.6	13.1
45 – 54	S	18.5	16.1	20.8	21.1	21.1	21.0	21.1	19.1	23.1
	C	13.2	8.9	12.4	15.0	14.2	13.6	15.2	11.4	12.9
55 – 59	S	10.0	10.2	10.2	9.9	9.5	10.4	10.7	9.4	12.1
	C	4.6	3.7	4.2	5.2	4.6	4.6	5.0	4.5	5.7
60 +	S	42.1	45.5	45.5	45.4	47.9	42.7	42.0	44.3	39.7
	C	14.0	17.6	15.9	17.6	27.6	22.6	15.7	22.1	25.5
INCOME										
< 10,000	S	6.2	6.0	6.3	10.2	10.7	9.7	6.8	5.4	8.3
	C	8.2	16.3 ³	17.5 ³	19.9	21.2 ³	23.2 ³	15.9 ³	16.8 ³	24.1 ³
10,000 – 49,999	S	73.0	73.8	72.3	70.3	71.3	69.3	68.5	72.5	64.5
	C	57.7	76.2 ³	70.2 ³	67.0	68.8 ³	68.9 ³	66.6 ³	73.6 ³	65.4 ³
> 50,000	S	20.8	20.1	21.5	19.5	18.0	21.0	24.7	22.1	27.2
	C	34.1	7.5 ³	12.3 ³	13.1	9.3 ³	7.9 ³	17.6 ³	9.7 ³	10.5 ³

Table notes:

1. All numbers are percentages of the population or sample.
2. All Census data from 2000 Census, unless otherwise noted (U.S. Bureau of Census, 2000).
3. 1990 Census data (U.S. Bureau of Census, 1990).

Descriptive Statistics for Stage of Physical Activity

The proportion of subjects in each stage of physical activity is reported by gender for the entire sample in Table 4. A high percentage (83.0%) of subjects reported being physically active (i.e., action, physically active for less than six months; and maintenance, physically active for six months or more), while 6.5% reported no interest in physical activity (i.e., precontemplation, not physically active and with no intention of becoming physically active). The remaining subjects were split between contemplation

Table 4. The stages of physical activity for the sample, by gender.

STAGE	MALE	FEMALE	TOTAL
Precontemplation	57 ¹ (6.2) ²	61 (6.8)	118 (6.5)
Contemplation	32 (3.5)	56 (6.1)	87 (4.8)
Preparation	46 (5.0)	58 (6.4)	104 (5.7)
Action	104 (11.4)	150 (16.6)	254 (14.0)
Maintenance	677 (73.9)	577 (64.0)	1254 (69.0)
All	916 (50.4)	901 (49.6)	1817 (100.0)

Table notes:

1. Data reported by number in each cell, n.
2. Data reported by percentage of each gender, (%).

(not currently physically active, but planning to start within the next six months) and preparation (not physically active now, but planning to start within the next 30 days) at 4.8 and 5.7%, respectively.

Descriptive Statistics for Diet

The results of the dietary classification by stage of physical activity are shown in Table 5. The majority of the sample (85.5%) was categorized in the average dietary category (i.e., a dietary score between 23 and 43) with 68.6% of those subjects reporting themselves in the maintenance stage for physical activity. Two hundred and twenty-five subjects (12.4%) reported themselves as having an unhealthy diet, with the majority (68.4%) also in the maintenance stage of physical activity. A total of 39 subjects (2.1%) reported a healthy diet, again with the majority (87.2%) in the maintenance stage of physical activity.

Table 5. The number of respondents in each stage of physical activity compared to their dietary habits.

STAGE	DIETARY HABITS		
	Healthy (>43)	Average (23 – 43)	Unhealthy (≤ 22)
Precontemplation	0 ¹ (0.0) ²	99 (6.4)	19 (8.4)
Contemplation	0 (0.0)	73 (4.7)	14 (6.2)
Preparation	1 (2.6)	84 (5.4)	19 (8.4)
Action	4 (10.3)	231 (14.9)	19 (8.4)
Maintenance	34 (87.2)	1066 (68.6)	154 (68.4)
All	39 (2.1)	1553 (85.5%)	225 (12.4)

Table notes:

1. Data reported by number in each cell, n.
2. Data reported by percentage of each dietary habits category, (%).

Roughly three times as many women as men reported eating a healthy diet (male = 20.5%, female = 79.5%) while twice as many men reported eating an unhealthy diet (male = 65.3%, female = 34.7%) (see Table 6). Almost 75% of those reporting a healthy diet were 60 years of age or over, while those reporting an unhealthy diet appeared to be younger (≤ 49 years = 73.3%). In other words, very few people were eating a healthy diet, but of those who do, they are more likely to be women and over the age of 60. A complete display of demographic and socioeconomic data, compared to dietary habits, is shown in Appendix D, Table 21.

Table 6. The dietary habits of the sample by selected demographic variables.

VARIABLE	DIETARY HABITS		
	Healthy (>43)	Average (23 – 43)	Unhealthy (≤22)
GENDER			
Male	8 ¹ (20.5) ²	761 (49.0)	147 (65.3)
Female	31 (79.5)	792 (51.0)	78 (34.7)
All	39 (2.1)	1553 (85.5)	225 (12.4)
AGE			
<30 years	0 (0.0)	85 (5.5)	50 (22.2)
30 – 39 years	1 (2.6)	142 (9.1)	59 (26.2)
40 – 49 years	3 (7.7)	284 (18.3)	56 (24.9)
50 – 59 years	6 (15.4)	316 (20.3)	31 (13.8)
60+ years	29 (74.4)	726 (46.7)	29 (12.9)
All	39 (2.1)	1553 (85.5)	225 (12.4)

Table notes:

1. Data reported by number in each cell, n.
2. Data reported by percentage of each dietary habits category, (%).

Descriptive Statistics for Attitude Toward Body Image

The results of examining individual attitudes toward other people's bodies and stage of physical activity are shown in Table 7. Over 98% (n = 1790) of the respondents reported having a neutral attitude toward other people's bodies. By stage, 95% of the subjects classified in precontemplation were also classified as having a neutral attitude

toward other people's bodies; 98.9% of subjects categorized as contemplators reported having a neutral attitude toward other people's bodies; 97.1% of those in preparation reported having a neutral attitude toward other people's bodies; and both action and maintenance exceeded 99.0% with a neutral attitude toward the image of other people's bodies. It appears that regardless of stage of physical activity, subjects had a neutral attitude toward other people's bodies. A complete display of demographic and socioeconomic data, compared to attitude, is shown in Appendix D, Table 22.

Table 7. The number of respondents in each stage of physical activity compared to their attitude toward other people's bodies.

STAGE	ATTITUDE		
	Positive (≥ 16)	Neutral (8 - 15)	Negative (< 8)
Precontemplation	5 ¹ (31.3) ²	112 (6.3)	1 (9.1)
Contemplation	1 (6.3)	86 (4.8)	0 (0.0)
Preparation	3 (18.8)	101 (5.6)	0 (0.0)
Action	0 (0.0)	252 (14.1)	2 (18.2)
Maintenance	7 (43.8)	1239 (69.2)	8 (72.7)
All	16 (0.9)	1790 (98.5)	11 (0.6)

Table notes:

1. Data reported by number in each cell, n.
2. Data reported by percentage of each attitudinal category, (%).

Descriptive Statistics for Diet and Attitude

A cross tabulation between dietary habits and attitude toward other people's bodies was performed with the results shown in Table 8. A majority of the sample 1532 (98.6%) reported both average dietary habits and a neutral attitude toward other people's bodies. Over 200 subjects (12.1% of the sample) were classified as having an unhealthy diet and a neutral attitude. All 39 respondents (2.1%) classified with a healthy diet indicated that they had a neutral attitude toward the image of other people's bodies. Therefore, most respondents eat an average diet and are neither positive nor negative in their attitude toward other people's bodies.

Table 8. A comparison between attitude toward other people's bodies and dietary habits.

ATTITUDE	DIET		
	Healthy	Average	Unhealthy
Positive	0 ¹ (0.0) ²	9 (0.6)	2 (0.9)
Neutral	39 (100.0)	1532 (98.6)	219 (97.3)
Negative	0 (0.0)	12 (0.8)	4 (1.8)
All	39 (2.1)	1553 (85.5)	225 (12.4)

Table notes:

1. Data reported by number in each cell, n.

2. Data reported by percentage of each dietary habits category, (%).

Statistical Analysis

Correlation Matrix

A partial correlation was performed as a preliminary examination of multicollinearity present between independent variables. No correlation exceeded 0.7. It is generally agreed that if two variables are correlated at 0.9 or higher they should be removed from the model (Tabachnick & Fidell, 1989). Since none of the variables were significantly correlated to one another, they were all included in the regressions. The correlation matrix is shown in Appendix D, Table 23.

Linear Regression

Separate regression models were performed using diet and attitude as the dependent variables and stage of physical activity, gender, age, race, education, BMI, employment status, and income as the independent variables. Stage of physical activity was the independent variable of interest. Significance was determined at the .05 level of confidence.

Diet. Significance was found in the relationship between diet and stage of physical activity. Specifically, three stages were significant, precontemplation (.000), contemplation (.004), and preparation (.000) (see Table 9). A graphic portrayal of the relationship between stage and diet is shown in Figure 2. While the mean composite score for diet changes little between stages (28 – 32) the maximum scores are more varied (42 - 50). Nevertheless, the tests for statistical significance coupled with the

scores described in Figure 2, show that as stage of physical activity progresses (i.e., from precontemplation toward action and maintenance) dietary scores improved.

Table 9. Linear regression analysis – dependent variable = DIET.

VARIABLE	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Constant	18.580	1.190		.000*
Action	-.741	.390	-1.902	.057
Preparation	-2.091	.582	-3.589	.000*
Contemplation	-1.800	.629	-2.863	.004*
Precontemplation	-2.713	.547	-4.962	.000*
Female	2.851	.274	10.404	.000*
Age	.171	.011	15.814	.000*
White	1.157	.679	1.704	.089
Some College	1.169	.312	3.744	.000*
College Degree	4.312	.376	11.463	.000*
BMI	<.000	.024	-1.244	.213
Employed	-1.214	.383	-3.171	.002*
Retired	.290	.444	.653	.514
Income >\$30K	1.157	.679	1.704	.089

Table notes:

1. $R^2 = .341$; Adjusted $R^2 = .336$; $\alpha < .050$

2. Missing variables: Maintenance, Male, Non-white, High School Diploma or Less, Not Employed, Income <\$30,000

Other independent variables were statistically significant and included gender (.000), age (.000), education (.000), and employment status (.002). As can be seen in Table 10, dietary habits tend to be healthier for women (male = 29.4, female = 32.3),

older people ($\leq 49 = 27.0$, $> 50 = 33.0$), those with a better education (high school or less = 31, some college = 30, and college degree = 33), and those who are employed or retired (not employed = 28, employed = 31, and retired = 34). A complete table of descriptive statistics as they relate to diet is shown in Appendix D, Table 21.

Figure 2. Mean diet composite scores by stage of physical activity.

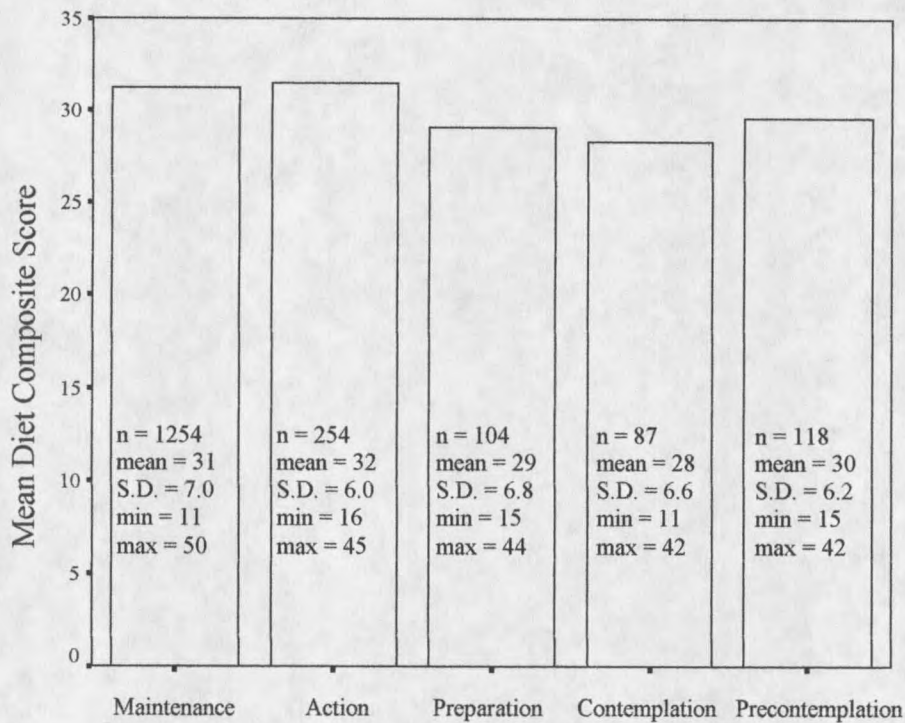


Table 10. The descriptive statistics for variables of significance as they compare to the dependent variable of DIET.

VARIABLE	DIETARY HABITS	VARIABLE	DIETARY HABITS
GENDER		AGE	
Male	n = 916 mean = 29.4 S.D. = 6.69	<30 – 49 years	n = 680 mean = 27.0 S.D. = 6.6
Female	n = 901 mean = 32.3 S.D. = 6.75	50 – 60+ years	n = 1137 mean = 33.0 S.D. = 6.1
EDUCATION		EMPLOYMENT	
High School or Less	n = 727 mean = 31 S.D. = 6.9	Not Employed	n = 179 mean = 28 S.D. = 6.6
Some College	n = 699 mean = 30 S.D. = 7.0	Employed	n = 1019 mean = 31 S.D. = 6.7
College Degree	n = 391 mean = 33 S.D. = 6.0	Retired	n = 619 mean = 34 S.D. = 5.8

Table note: Numbers based upon mean diet composite score. A higher score indicates a healthier diet.

Table 11 shows the average diet composite score as a comparison between the significant independent variables. From this table it can be seen how dietary habits improve if one is female, as one grows older (in all categories except retired), or as one becomes more educated.

Table 11. A comparison of diet mean composite scores between independent variables of significance.

VARIABLE	<49 Years Old	>50 Years Old	Female	Male	High School or Less	Some College	College Degree
Female	29.07	32.22					
Male	25.83	31.67					
High School or Less	25.43	32.62	32.09	29.16			
Some College	26.83	32.33	31.49	28.00			
College Degree	30.96	34.72	34.67	32.08			
Not Employed	28.88	32.43	31.67	29.29	30.04	30.79	34.30
Employed	26.97	30.88	29.81	27.55	26.85	27.43	31.56
Retired	34.67	34.21	35.43	32.85	33.38	34.62	36.51

Table note: All scores are the mean diet composite score for that categorical combination indicated.

Attitude. Significance was found in the relationship between attitude toward other people's bodies and stage of physical activity. Specifically, individuals in the precontemplation stage of physical activity were significantly (.002) different than those in the maintenance stage of physical activity (see Table 12). A graphic portrayal of the relationship between stage and attitude is shown in Figure 3. Individuals in precontemplation had a higher mean composite score (12.1) and a higher average maximum score (19) than the other stages. This coupled with the level of significance indicates that those in precontemplation have a more positive attitude toward the image of other people's bodies than individuals in the maintenance stage of physical activity.

Table 12. Linear regression analysis – dependent variable = ATTITUDE.

VARIABLE	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Constant	10.931	.313		.000*
Action	<.000	.103	-.730	.465
Preparation	.206	.153	1.342	.180
Contemplation	.323	.166	1.951	.051
Precontemplation	.448	.144	3.111	.002*
Female	-.102	.072	-1.410	.159
Age	<.000	.003	1.008	.313
White	.485	.179	2.709	.007*
Some College	~.000	.082	.236	.814
College Degree	.114	.099	1.154	.248
BMI	~.000	.006	.396	.692
Employed	<.000	.101	-.861	.390
Retired	~.000	.117	.364	.716
Income >\$30K	.101	.076	1.325	.185

Table notes:

1. $R^2 = .020$; Adjusted $R^2 = .013$; $\alpha < .050$
2. Missing variables: Maintenance, Male, Non-white, High School Diploma/GED or less, Not Employed, Income <\$30,000

Race was also significantly related to attitude toward the image of other people's bodies (.007). These results indicate that whites have a more positive attitude toward the image of other people's bodies than individuals classified as non-whites. The descriptive statistics for race is shown in Table 13. A complete table of descriptive statistics as they relate to attitude is shown in Appendix D, Table 22.

Figure 3. Mean attitude composite scores by stage of physical activity.

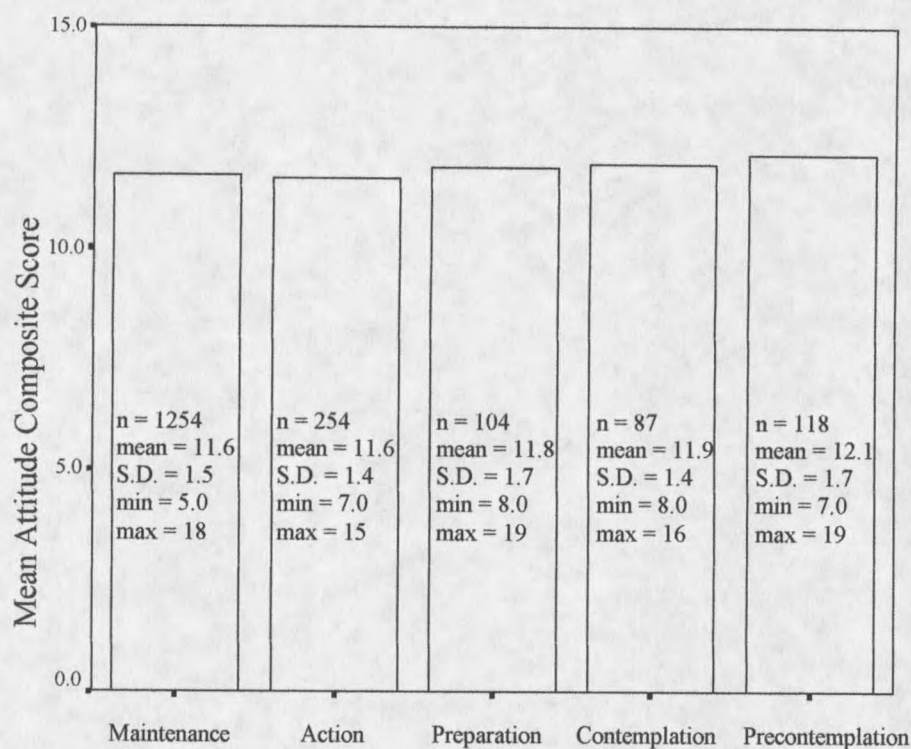


Table 13. The descriptive statistics for the variables of significance as they relate to the dependent variable of ATTITUDE.

RACE	ATTITUDE
White	n = 1745 mean = 11.7 S.D. = 1.48
Other	n = 72 mean = 11.2 S.D. = 1.51

Table note: Numbers based upon mean attitude composite score. A higher score indicates a more favorable attitude.

CHAPTER 5

DISCUSSION

The purpose of this study was to determine, if individuals who are more physically active demonstrate healthier dietary patterns than those who are less physically active (H_a #1), and if individuals who are more physically active demonstrate a less favorable attitude toward the image of other people's bodies than those who are less physically active (H_a #2). Data from this study supports the acceptance of both of these hypotheses. A discussion of the outcomes of this study is presented by dependent variable (i.e., diet and attitude) followed by limitations and directions for future research.

Diet

A sedentary lifestyle, coupled with poor dietary habits, continues to be a health risk for many Americans. With 40% of the population not engaged in any regular physical activity and most not consuming the recommended daily allowance of healthy foods it is not surprising that over 30% of the population is obese (CDC, 1997; CDC, 1999; ODPHP, 2000).

After controlling for the independent variables (i.e., gender, age, race, education, BMI, employment status, and income) the maintenance stage of physical activity was found to be a predictor of eating a healthy diet. Subjects in the maintenance stage were

significantly more likely to eat a healthier diet than those in precontemplation, contemplation, or preparation.

Additionally it was found that gender, age, education, and employment status were predictors of eating a healthy diet. In addition to females, as people became older, more educated (some college or a college degree), or if they were employed, they were more likely to eat a healthier diet. Race, BMI, and income had no relationship to dietary habits.

Previous work by Wilcox (2000) showed that there was no relationship between an increased level of physical activity and diet. However, the results of this investigation indicate change in one could affect the other (e.g., increasing the level of physical activity could lead to an improvement in dietary habits). These two areas, physical activity and dietary habits have long been challenges to the health promotion community (ODPHP, 2000). Given the results of this study it may be possible to target interventions for individuals based on which area they are most receptive to changing. For example, an individual may adamantly oppose changing dietary habits, but is interested in increasing physical activity levels. By assisting with a physical activity program the individual may eventually improve their dietary habits as they become more active (progress through the stages of physical activity from precontemplation toward action and maintenance).

Since only two studies have examined this thesis and have reported diametric results, further investigation is necessary.

Attitude

Of more recent consideration is the concern about how other people react toward the image of other people's bodies (Moore & Pelican, 2000). The idea being that if people perceive themselves as the object of a negative attitude, they will continue their current lifestyle (i.e., lack of physical activity) because their perceptions act as a barrier to change.

After controlling for the independent variables (i.e., gender, age, race, education, BMI, employment status, and income) the model was significant in predicting that precontemplators were significantly different in their attitude toward the image of other people's bodies. However only 2% of the variance was explained through this model. This implies that those in precontemplation have a more positive attitude toward the body image of others than do individuals in the maintenance stage of physical activity.

It was also found that race was a predictor of attitude. Specifically, whites were more likely to have a positive attitude toward the body image of others than non-whites. But given the low occurrence of other races ($\leq 4\%$) participating in this study, these results need to be replicated using a more racially diverse sample.

While this research did show a relationship between stage of physical activity and attitude, the relationship was weak and deserves further study. Nevertheless, if additional investigations substantiate this relationship practitioners will have another tool with which to work. By addressing people's attitudes toward the body image of others it may be possible to breakdown barriers that prevent many from participating in regular

physical activity because of their body size. These techniques may include educational material, discussion groups, and counseling.

Limitations and Directions for Future Research

Several limitations were present during the conduct of this study. First, the study relied on self-reporting of eating habits, level of physical activity, and attitude toward the image of other people's bodies. A review of research on the validity of self-reporting found that people tend to underreport certain behaviors if they believe them to be socially undesirable (Strecher, Becker, Clark, & Prasada-Rao, 1989). As an example, people tend to underreport alcohol consumption. Erroneous recall can affect the validity of self-reports and it has been found to be more of a problem with amounts consumed (e.g., dietary habits) than with a behavior status (e.g., level of physical activity) (Costakis, 1998). Future research should consider the use of face-to-face interviews or observation in attempt to gather more accurate data.

Second, the results of this study are not generalizable, given the differences between the sample and the population in each of the communities, specifically in the area of age and income. Over 40% of the respondents were above the age of 60, while 15.7 - 27.6% were actually in this age group according to Census data. Likewise, 5.4% - 10.7% reported an income of <\$10,000, and the Census indicated that 16.3 - 24.1% were actually in this category. Any future research should consider including a purposeful sample, to insure that the demographics are a reasonable sample of

the population, or weighting the variables to compensate for the over or under sampling of different variables.

Third, prior to mailing the survey packet, an introductory letter was mailed to each subject. The intent of this letter was to have a high profile community doctor communicate the importance of completing the survey to each recipient. The letters were mailed September 10, 2001, the day before the World Trade Center/Pentagon attacks. The principal investigators decided that it would be unwise, and perceived as in poor taste, to mail the surveys during that week. Consequently, the survey packets were mailed approximately two weeks later. This break between receipt of the introductory letter and the survey packet may have impacted the response rate. It should also be noted that the surveys were mailed at about the same time as the pre-Christmas mail-order catalogs/advertisements. It is possible that the recipients perceived the surveys as more "junk mail", and threw them away, negatively impacting the response rate.

Fourth, question 21 was a key question for this study as it categorized respondents by stage of physical activity. However, the definition of physical activity may not have discriminated sufficiently between stages. The definition included house-cleaning, lawn mowing, and gardening in addition to more traditional physical activities such as walking, jogging, bicycling, and swimming. This broad definition did not adequately differentiate the sample and a large number of respondents probably classified themselves erroneously into the maintenance stage. The original question, upon which question 21 was based, stated that regular exercise was "any *planned* physical activity (e.g., brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc.)" (Cancer

Prevention Research Center, 2002). This definition was changed in the final survey by dropping the word "planned" and placing the activities of house cleaning, lawn mowing, gardening, and dancing at the beginning of a list of suggested activities. These changes were made because of input from the pilot testing (planned physical activity equaled exercise to most respondents) and because the project leaders believed that the term exercise was too limiting. Future research should develop a more specific definition for physical activity (vice exercise) and develop other measurements to validate the input provided by respondents, as suggested in Cardinal's 1997 work. For example, Cardinal found that the most consistent of these other measurements that could also be incorporated into a future study were BMI (used in the present study), cardiorespiratory fitness (VO_{2MAX}), and exercise index (Cardinal, 1997).

Fifth, the results obtained during this study support the acceptance of the second hypothesis (i.e., individuals who are more physically active demonstrate a less favorable attitude toward the image of other people's bodies than those who are less physically active) but the model does not explain much of the variance (adjusted $R^2 = .013$).

The vast majority of respondents were classified as having neither a positive nor a negative attitude toward the body image of others. This was due to 98.5% selecting the neutral responses for the questions of interest. With 98.5% reporting a neutral attitude and 69% in maintenance, only .66% (12) of the subjects' responses were different than the majority. These results were caused, primarily, by the construction of the survey instrument and its inclusion of neutral responses. The neutral responses for the four body image questions were problematic. This neutral option may have allowed respondents to

opt out of indicating their true belief (i.e., negative, as suggested by respondents to an open-ended survey question), instead choosing a less socially unacceptable response (i.e., neutral). Qualitative responses from the survey (research of which was beyond the scope of this paper) supported this supposition. Most respondents indicated, in the open-ended question, that they had a negative and/or condescending attitude toward overweight people. This contradiction on the part of respondents could be alleviated in future studies through interviews, additional questions that specifically address overweight or underweight people, and the elimination of neutral responses.

Sixth, approximately four weeks after the surveys were mailed, a telephone follow-up was made to everyone who had been mailed a survey. The majority of these calls were made during business hours, consequently the greater part of these calls resulted in messages left on answering machines or no contact with the respondent. One state's team confined their calls between the hours of 4:00 and 8:00 pm. As a result 81 additional surveys were mailed, but only to the two communities of that state. No additional surveys were mailed in either of the other two states. Future researchers must address how to insure team members meet the principal investigator's intent during the conduct of a study. These methods could include detailed written instructions, a clear vision statement of what is trying to be accomplished, and discussions with team members about accomplishing a given task given the realities of the situation (e.g., efficacy of leaving messages and asking subjects to request another survey, phoning during the day when most people work, and dealing with answering machines). Another technique that would have been useful in this situation would have been to have some

form of survey identification. This would have limited the number of phone calls required and the corresponding time commitment required to call all subjects ($n = 3,275$).

Seventh, the questions used to determine the diet (specifically the sweetened drinks and whole grains questions) and attitude composite scores had low reliability (.3912, .4565, and -.4758, respectively). This indicates that these groups of questions were not reliable, that is, measuring the same thing. This may be related to the low number of questions per category (2 – 4), but more likely it requires a better analysis during question development.

Finally, the questions used to determine the dietary habits composite score did not address all of the components recommended by the American Dietetic Association or the U.S. Department of Agriculture for a healthy diet (i.e., the Food Guide Pyramid). Similarly, the questions that were used, and their scoring, are open to interpretation as to what constitutes a healthy diet. This issue was addressed in this study by reviewing the composite scoring system with a registered dietician (S. Pelican, personal communication, March 21, 2002). Future studies should develop an inclusive list of questions that address all components of the Food Guide Pyramid.

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APPENDICES

APPENDIX A

INTRODUCTORY LETTER AND QUESTIONNAIRE



Date

Address

Current Resident,

We are writing to ask your help in a study of people's opinions and attitudes about food, physical activity, and body image. The study is part of an effort to evaluate and effectively implement rural-based health interventions for you and your neighbors.

One member of your household is among a small number of people that are being asked to participate in Lewistown. Your community was selected as a representative population of the State of Montana.

In order for the results to truly represent the residents of your community, it is **vital** that your questionnaire be completed and returned by the adult (18 years of age or older) person who permanently lives in your home and **most recently had a birthday**.

The results of this project will be used to develop health related programs for your community and eventually for rural residents across the State.

Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified. This survey is voluntary. However, you can help us very much by taking a few minutes to share your opinion and experiences with us.

We have enclosed a small token of appreciation as a way of saying thanks for your help. If you have any questions or comments about this study, we would be happy to talk with you. Our toll-free number is 1-877-700-2237.

Thank you very much for helping with this important study.

Sincerely,

State Coordinator

Community Doctor

Wellness IN the Rockies Survey

Prepared by:
The University of Wyoming
The University of Idaho
Montana State University

The University of Montana, Data Collection Contractor

HOW WILL THE DATA FROM THIS SURVEY BE USED?

The data that you provide will be used in combination with data from other survey respondents to study and improve the health and well being of Wyoming, Idaho, and Montana residents.

IS MY PARTICIPATION VOLUNTARY?

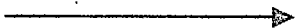
Yes, this survey is voluntary. In addition, you may skip any question that you do not want to answer. However, you can help us very much by taking a few minutes to share your experiences and feelings about food, physical activity, and body image.

WHO WILL HAVE ACCESS TO MY ANSWERS?

Only the study team from the universities named above will ever have access to individual survey answers. We want you to know that we will summarize all the responses; no individual responses will be released in any manner. Your participation in this survey is anonymous.

WHAT DO I DO WHEN I COMPLETE THIS SURVEY?

Please return it in the postage-paid envelope provided as soon as possible. If you have any questions call Janet Stevens toll free at (877) 700-2237.

PLEASE GO TO THE NEXT PAGE AND BEGIN 

INSTRUCTIONS

Who should complete this survey?

So that the results of this survey will accurately represent all of the adults in your town, it is very important that the survey be completed by the adult (18 years or older) who now lives in your house and has the most recent birthday.

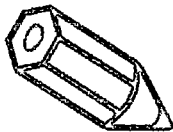
What is this survey about?

We are interested in your thoughts, feelings, attitudes and experiences as they relate to food, physical activity and body image. There are no right or wrong answers.

What do I do?

Please mark one box (X) or write in the most appropriate response for each question.

START HERE



1. How often do you eat green salad? Mark one box (X).

- ☐ Never
- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5 or more times per week

2. How often do you eat potatoes, not including french fries, fried potatoes or potato chips?

- ☐ Never
- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5 or more times per week

3. How often do you eat carrots?

- ☐ Never
- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5 or more times per week

4. Not counting carrots, potatoes or salad, how often do you eat vegetables?

- ☐ Never
- ☐ Less than once a week
- ☐ About once a week
- ☐ 2-5 times per week
- ☐ About once a day
- ☐ 2 or more times per day

5. How often do you drink sweetened beverages other than soft drinks (soda pop), for example, Kool-aid, Snapple, Sunny Delight, sweetened teas, etc.?

- ☐ Never
- ☐ Less than once a week
- ☐ About once a week
- ☐ 2-5 times per week
- ☐ About once a day
- ☐ 2 or more times per day

6. How often do you drink 100% fruit or vegetable juices such as apple, orange, grapefruit, or tomato?

- ☐ Never
- ☐ Less than once a week
- ☐ About once a week
- ☐ 2-5 times per week
- ☐ About once a day
- ☐ 2 or more times per day

7. Not counting juice, how often do you eat fruit?

- ☐ Never
- ☐ Less than once a week
- ☐ About once a week
- ☐ 2-5 times per week
- ☐ About once a day
- ☐ 2 or more times per day

8. How often do you drink soft drinks or soda pop (regular or diet)?

- ☐ Never
- ☐ Less than once a week
- ☐ About once a week
- ☐ 2-5 times per week
- ☐ About once a day
- ☐ 2 or more times per day

9. How often do you drink milk?

- ☐ I do not drink milk (Skip to 10)
- ☐ Less than once a week (Go to 9a)
- ☐ About once a week (Go to 9a)
- ☐ 2-5 times per week (Go to 9a)
- ☐ About once a day (Go to 9a)
- ☐ 2 or more times per day (Go to 9a)

9a. If you drink milk, what kind of milk do you usually drink?

- ☐ Whole milk
- ☐ 2 percent milk
- ☐ 1 percent milk
- ☐ Non-fat (Skim) milk

10. How often do you eat a high-fiber cereal, either hot or cold, such as bran cereal, raisin bran, shredded wheat, oat bran, or oatmeal?

- ☐ Never
- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5 or more times per week

11. How often do you eat whole-grain breads such as whole wheat, rye or pumpernickel?

- ☐ Never
- ☐ Less than once a week
- ☐ About once a week
- ☐ 2-5 times per week
- ☐ About once a day
- ☐ 2 or more times per day

12. A "super-sized" portion of food is one that is much bigger but costs only a little more money. When you have the option of getting a "super-sized" portion, how often do you order it?

- ☐ Never
- ☐ Seldom
- ☐ Sometimes
- ☐ Most of the time
- ☐ Always

13. How often do you eat without feelings of guilt?

- ☐ Never
- ☐ Seldom
- ☐ Sometimes
- ☐ Most of the time
- ☐ Always

14. How often do you eat food (meals or snacks) while doing another activity, for example, watching TV, working at a computer, reading, driving, playing video games, etc.?

- ☐ Never
- ☐ Seldom
- ☐ Sometimes
- ☐ Most of the time
- ☐ Always

15. How often does your whole family eat dinner/supper together?

- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5-7 times per week
- ☐ I live by myself, does not apply

16. How often are all or most of the foods you eat at dinner/supper prepared at home?

- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5-7 times per week

17. How often does your whole family eat breakfast together?

- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5-7 times per week
- ☐ I live by myself, does not apply

18. When you think about eating, what is the first thing that comes to mind? Please write your response below.

The next series of questions ask about physical activity.

19. What are your thoughts about the idea of being physically active? Please write your response below.

20. Regular physical activity includes actions such as house cleaning, lawn mowing, gardening, dancing, walking, aerobics, jogging, bicycling, swimming, etc. that result in actively moving your body for 30 minutes or more each day. Given this definition (actively moving 30 minutes or more each day), how often do you engage in regular physical activity?

- ☐ Less than once a month
- ☐ 1-3 times per month
- ☐ About once a week
- ☐ 2-4 times per week
- ☐ 5 or more times per week

21. Using the definition at the beginning of question 20 (actively moving 30 minutes or more each day), which of the following best describes you? Mark one box (X).

- ☐ I'm physically active and have been so for more than 6 months
- ☐ I'm physically active and have been so for less than 6 months
- ☐ I'm not physically active now but plan to start within in the next 30 days
- ☐ I'm not physically active now but plan to start within the next 6 months
- ☐ I'm not physically active now and don't plan to start

22. How often does self-consciousness about your body size or shape keep you from participating in physical activity?

- ☐ Never
- ☐ Seldom
- ☐ Sometimes
- ☐ Most of the time
- ☐ Always

23. How many hours do you watch television each day?

- ☐ 8 hours or more
- ☐ About 6-7 hours
- ☐ About 4-5 hours
- ☐ About 2-3 hours
- ☐ An hour or less

24. During your leisure time, how many hours are you spending on the computer or playing video games each day?

- ☐ 8 hours or more
- ☐ About 6-7 hours
- ☐ About 4-5 hours
- ☐ About 2-3 hours
- ☐ An hour or less

25. Regular physical activity plays a role (or would play a role) in improving my health.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

26. Regular physical activity makes me (or would make me) a happier person.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

27. I enjoy being physically active.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

28. I find physical activity to be unpleasant.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

29. I get as much physical activity as I need.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

We are now interested in your responses to some questions related to body image.

30. When you see a very overweight person, what is the first thing that comes to mind? Please write your response below.

31. I am satisfied with my height.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

32. Many different shapes and sizes of human bodies can be attractive.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

33. I prefer not to associate with people who have excessive fat.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

34. I don't care what people think about my body size or shape.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

35. My body isn't perfect, but I'm comfortable with how I look.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

36. I have abilities, skills and strengths that are more important than my body size or shape.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

37. I would be more successful and happier if my body size and shape were closer to perfect or ideal.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

38. Genetics play a dominant role in determining a person's body size and shape.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

39. I am satisfied with my weight.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

40. I would lose respect for a person who started getting fat.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

41. I can reduce my risk of poor health by following a healthy lifestyle.

- ☐ Yes, I strongly agree
- ☐ Yes, I agree
- ☐ No, I disagree
- ☐ No, I strongly disagree
- ☐ I neither agree nor disagree

We will conclude by asking you some general health and classification questions. This information is needed to develop our health programs.

42. Thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good? Please write the number of days below in the spaces provided.

___ ___ Number of days
☐ ___ Don't know/not sure

43. Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? Please write the number of days below in the spaces provided.

___ ___ Number of days
☐ ___ Don't know/not sure

44. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation? Please write the number of days below in the spaces provided.

___ ___ Number of days
☐ ___ Don't know/not sure

45. What is your sex?

- ☐ Female
☐ Male

46. What is your age and what is your date of birth?

___ ___ ___ Age (years)

Print numbers on lines below:

___ ___ ___
 Month Day Year

→ **NOTE: Please answer BOTH questions 47 and 48.**

47. Are you of Spanish or Hispanic origin such as Mexican, Central American, Puerto Rican, or Cuban? Mark one box (X).

- ☐ Yes
☐ No

48. What is your race? Mark one or more boxes (X).

- ☐ White
☐ Black, African American, or Negro
☐ Asian or Pacific Islander
☐ American Indian or Alaska Native
☐ Other (Specify)

49. What is the highest degree or level of school you have completed? Mark one box (X).

- ☐ Grades 1-8 (Elementary)
☐ Grades 9-12 (Some high school but no diploma)
☐ Grade 12 or GED (High school graduate)
☐ College 1 year to 4 years (Some college or technical school, but no degree)
☐ College 1 year to 4 years (Associate Degree)
☐ College 4 years or more (College graduate, BA, MA, JD, MD, PhD)

50. What is your approximate weight in pounds without shoes? Please write your weight below.

___ ___ ___ Pounds

51. What is your approximate height in feet and inches (without shoes)? Please write your height below.

___ Feet ___ ___ Inches

52. Which of the following describes your employment situation right now?

Mark one box (X).

- ☐ Employed full-time
- ☐ Employed, but on leave
- ☐ Employed part-time
- ☐ Not employed
- ☐ In school
- ☐ Staying at home, homemaker
- ☐ Retired

53. Which of the following categories best describes your total household income from all sources in the year 2000 before taxes and other deductions? Mark one box (X).

- ☐ Less than \$10,000
- ☐ \$10,000 - \$19,999
- ☐ \$20,000 - \$29,999
- ☐ \$30,000 - \$39,999
- ☐ \$40,000 - \$49,999
- ☐ \$50,000 or more

54. Including you, how many people 18 years of age or older live in your household?

___ ___ Number of adults

55. How many people in your household are under 18?

___ ___ Number of children

56. Do you provide care for a disabled or elderly member of your family?

- ☐ Yes
- ☐ No

57. Which of the following communities do you live in?

- ☐ American Falls, Idaho
- ☐ Preston, Idaho
- ☐ Lewistown, Montana
- ☐ Miles City, Montana
- ☐ Powell, Wyoming
- ☐ Torrington, Wyoming

Thank you very much for taking the time!

APPENDIX B

WELLNESS IN THE ROCKIES (WIN THE ROCKIES)

GUIDING PRINCIPLES

Guiding Principles

1. Principles of body-size differences and size-acceptance. Accept and value every body, whatever size or shape. Help people feel good about their bodies and about who they are. Recognize that people of all sizes and shapes can reduce their risk of poor health by adopting a healthy lifestyle. Challenge your own size-prejudice beliefs.
2. Principles of positive self-acceptance. Value yourself regardless of your size or shape. Identify your strengths and abilities and build on your assets. Be critical of messages that focus on unrealistic body images as symbols of success and happiness.
3. Principles of physically active living. Enjoy physical activity every day. Participate in activities for the joy of feeling your body move. Make physical activity fun.
4. Principles of healthful and pleasurable eating. Take pleasure in eating. Take control—eat when hungry and stop when satisfied. Follow the Food Guide Pyramid. Honor the gift of food.

APPENDIX C

PILOTING STUDY PROTOCOL AND RESULT

Introduction

A convenience sample survey was conducted on August 7 and 8, 2001 in Three Forks, MT. The purpose of the survey was to pilot the proposed WIN the Rockies survey with an interviewer present to assess the difficulty of the survey and the understanding of respondents. It should be noted that the numbers used in this report are those of the questions in the original survey, some numbers may have changed as questions were deleted or rearranged.

The intent was to present the subject with the introductory letter (which would normally arrive 2-3 days prior to the survey), allow them to read it, and then present them with the survey. Both items were to be packaged as if they had received them in the mail. The survey envelope had a Montana State University – Bozeman return address. The survey had \$1 attached.

Two methods were used; a retrospective method was employed with approximately half of the respondents. This method involved explaining the purpose of the survey and the WIN the Rockies initiative, allowing the individual to complete the survey, without assistance from the interviewer, and then questioning the respondent about various aspects of the questionnaire. The second method was a concurrent interview. In this technique the respondent is asked to “think out loud” while completing the survey. In this way the interviewer is able to determine if the questions were being interpreted correctly and if there were any wording problems.

Demographics

The sample consisted of 20 whites, with an average age of 47 (18-70). There were 4 males and 15 females; all were at least high school graduates, except one who had some high school but no diploma. Average height and weight were 5 ft. 6 in. and 159 pounds, respectively. Twelve were employed full-time, 5 part-time, and 2 were retirees. Average income was reported to be \$30,000 - \$39,000 and most reported to be living in a home with two adults (n=13). Eight of the respondents reported living in a home with at least one child under the age of 18. Few reported taking care of disabled or elderly family members (n=2 reporting care for elderly).

Results

Overview. The majority of those selected to participate were very helpful and happy to assist with the project. Only one respondent refused to complete the survey. He would have opened and read the introductory letter received prior to the survey's arrival, and would have opened the survey, but then thrown it away. Several respondents said they would be very interested in the results of the survey and wondered how that could be provided to them if they had been participants. At least one respondent could not see how answering these questions would provide anyone with useful data.

Introductory Letter. The introductory letter was not available for this pilot. The contents of the letter were explained to each subject and they were asked their opinion about the information contained and about the relevance of the signature. Most thought

that a local doctor's signature would carry the most weight with them. The signature of a local doctor implied that he/she "approved" of the program. One individual emphasized that it should be a "heartfelt request", polite, and it should generate curiosity about the survey.

Survey Envelope. Most respondents said that the envelope looked official and all agreed that they would open it. It was important to at least two respondents that the envelopes not have bulk mailing cancellation markings. (The envelope contained only the cover letter and the survey.)

Survey Cover Letter. All agreed that it was complete and answered any questions they might have (provided they had received the introductory letter). Two respondents remarked that they liked having a phone number available to call, but they also stated that they disliked seeing the numbers as letters (877-700-BBER). One person expressed concern about anonymity, which was alleviated by the cover letter. One respondent stated that upon reading WIN the Rockies, they would have thrown the survey away, assuming that it was some type of sweepstakes entry. At least one other person also remarked about the term "WIN", and wondered what they were winning.

One Dollar Incentive. At least two respondents were put off by the presence of the \$1. They felt it cheapened their participation in the survey. They recommended that a card/note be attached that explained the \$1 as a token of thanks that they could keep or donate to a local charity. The majority of respondents were pleasantly surprised by the \$1 and stated they would most likely complete the survey out of guilt.

Survey. All respondents found the survey very easy to navigate and complete, and the length was about right. There were a few words and phrases that were difficult, but most respondents did not find any words or phrases unfamiliar. Several respondents reported some offensive questions. These centered on personal weight, perceptions of overweight people, income, and number of children. However, almost all said they would complete the survey and mail it. General instructions might include that the respondent may complete the survey in either pen or pencil.

Open-Ended Questions. Many people had difficulty interpreting the open-ended questions (18, 29, 41).

18 – This question lacked focus. Most thought this question related to what type of food to eat, they could not understand the purpose of the question or what type of answer to provide.

29 – Vague. The word “reaction” confused most respondents. After answering the series before (24-28) they could not understand how to answer this question. Many remarked that they knew what the “right” answers were for 24-28, and if they answered those “correctly” their “reaction” to being physically active was self-evident.

41 – If any question came close to being offensive, this was it. The respondents did like the implication that they would react differently to a person if they were overweight. At least one respondent remarked that the desired answer seemed to be “they’re fat”.

Other questions. The following is an explanation of findings and recommendations for the questions identified.

1-11, 15-17 – There is no “never” option. Many people tried to determine their averages by interpolating their annual numbers. This was because many of the questions related to seasonal foods or activities.

5 – The question uses the phrase “other than soft drinks”. Some respondents thought Kool-Aid was a soft drink. Some respondents were not sure if soda pop was included in this question, since soda pop is included in a later question that had not been read.

8 – One respondent thought this question should specify if diet pop were included. One respondent thought there should be a question related to drinking coffee.

9 – The arrow confused at least one person. They interpreted the arrow to mean that they should move from question 9, directly to question 10, skipping 9a. At least one person asked for a soymilk option. One person reported not drinking milk but using large quantities on cereal, enough to count as a serving, but this was not an option. Another individual reported not drinking milk but drinking several lattes each day, also not an option.

13 – At least one respondent thought this question should really be asking, “How often do I know better when I eat something unhealthy”.

15 and 17 – These questions do not take into account single people.

19-20 – Most respondents had difficulty with question 19 and this resulted in some challenges with answering question 20. The main problem with question 19 was

the word "planned", to most this immediately implied exercise. To add to the confusion was the list of activities that started with walking, aerobics, jogging.... House cleaning was sixth on the list. Many respondents felt this could be worded better to give a stronger definition of physical activity as opposed to exercise. At least one respondent thought this question should be prefaced with an open-ended question, "What type of daytime activity do you do? For how long?" They also felt that the list should include construction, ranching, farming, serving tables, and other work related activities.

22-23 – The answers to these questions depended on the day of the week and the time of the year.

24-28, 30-40 – Many respondents had difficulty trying to work through the "yes, I strongly agree" format. They would have preferred deleting the "yes" and "no" part of the answer.

25 – One respondent questioned the use of the word "happier", suggested using "fulfilled" instead.

25-27 – Questions 25 and 26 seemed to be asking the same question, which was the opposite of question 27. At least one respondent found this to be redundant.

Just prior to question 30 is an introductory sentence. The word "of" in the second line should be deleted.

30-40 – Some respondents felt a need to explain their answers on these questions and wanted a line to write in their response.

34 – The word "attractive" sounds feminine. How do males respond?

35 – The word “strengths” and “abilities” implied physical abilities versus traits and skills.

36 – At least one respondent did not like the word “perfect,” thought ideal should stand-alone.

39 – Some respondents could not give a pat answer for this question. They felt they needed to know why the person was starting to get fat.

40 – At least one respondent felt that this question would only generate the “right” answer, and not any useful data.

42-43 – At least one respondent thought these questions were related to seasonal problems (e.g., allergies, “cabin fever”).

43 – Several respondents were puzzled by this question, particularly the word “stress”. They all felt stress in their lives, and felt it was part of life. The question implied that stress also meant depression and problems with emotions. One individual reported receiving medication for manic depression and was not sure how to answer this question.

49 – The options do not include a BS.

50 – One respondent would have preferred to select from a range of weights, instead of writing down the exact number.

56 – At least one respondent wondered if “provide care” could mean money only.

Recommendations

Introductory Letter. Use the signature of a local doctor. Letter should be personalized as much as possible.

Cover Letter. Spell out "Wellness in the Rockies", the expression "WIN" could be explained in the introductory letter. Include the WIN logo. Delete the letters from the phone number.

One-Dollar Incentive. Attach the \$1 to a note explaining the purpose of the \$1 and possible uses.

Survey.

1-11, 15-17 – Add the option of "never". Also, qualify the question by adding "Generally, during a typical month how often do you . . ."

5 – Add the words "soda pop" after "soft drinks".

8 – Add in parentheses "(diet or regular)".

15 and 17 – Add the option of "I'm single".

19 – Add a preparatory question of "What type of daytime, or work related activity do you do?" Also, rearrange the list of activities to start with daily activities instead of exercise activities. Add "construction, ranching, farming, waiting tables".

22-23 – Add, "Generally, during a typical week day, how often do you ..."

24-28, 30-40 – Delete the words "yes" and "no".

25 – Change to read, “Regular physical activity makes me (or would make me) feel better about myself.”

Prior to question 30 delete the word “of” in the second line.

34 – Change the word “am attractive” to “look good”.

35 – Change “strengths and abilities” to “personal and professional skills and abilities”.

36 – Delete the words “perfect or”.

43 – Add the word “unhealthy” before stress.

49 – Add “BS” to the list at option 6.

50 – Clarify the type of care that can be provided.

APPENDIX D

TABLES

Table 14. Determination of imputed values for missing cases by question.

QUESTION	Number of Missing Cases	Variable Average	Imputed Value	Definition of Imputed Value
Q1	15	3.2	3	About once a week
Q2	8	3.3	3	About once a week
Q3	8	2.6	3	About once a week
Q4	6	3.2	3	2-5 times per week
Q5	10	1.5	2	2-5 times per week
Q6	6	2.5	3	2-5 times per week
Q7	4	2.9	3	2-5 times per week
Q8	9	2.5	3	2-5 times per week
Q10	21	2.9	3	About once a week
Q11	9	2.5	3	2-5 times per week
Q12	11	0.8	1	Most of the time
Q21	169	1.6	2	Action
Q32	135	2.0	2	No, I disagree
Q33	134	3.9	4	No, I disagree
Q38	29	2.3	2	No, I disagree
Q40	17	3.8	4	No, I disagree
Q45	24	1.5	12 = 1, 12 = 2	Male/Female
Q46	20	56.5	57	Age

Table 14. continued

QUESTION	Number of Missing Cases	Variable Average	Imputed Value	Definition of Imputed Value
Q49	19	4.0	4	Some college
Q50	39	177.5	177.5	Weight
Q51	24	67.5	67.5	Height
Q52	21	3.6	4	Not employed
Q53	181	3.8	4	\$30,000 - \$39,999

Table 15. Correlation matrix of fruits and vegetable dietary questions.

QUESTION	Q1	Q2	Q3	Q4	Q6	Q7
Q1	1.000	.2137 ¹	.4095 ¹	.3589 ¹	.1558 ¹	.3370 ¹
Q2		1.000	.2510 ¹	.3198 ¹	.1361 ¹	.1735 ¹
Q3			1.000	.3882 ¹	.2121 ¹	.3850 ¹
Q4				1.000	.2060 ¹	.4369 ¹
Q6					1.000	.2757 ¹
Q7						1.000

Table notes:

1. Significant at the .01 level (2-tailed).
2. Cronbach's $\alpha = .6967$; Standardized item $\alpha = .7041$

Table 16. Correlation matrix of sweetened drinks dietary questions.

QUESTION	Q5	Q8
Q5	1.000	.2431 ¹
Q8		1.000

Table notes:

1. Significant at the .01 level (2-tailed).
2. Cronbach's $\alpha = .3899$; Standardized item $\alpha = .3912$

Table 17. Correlation matrix of whole grains dietary questions.

QUESTION	Q10	Q11
Q10	1.000	.2958 ¹
Q11		1.000

Table notes:

1. Significant at the .01 level (2-tailed).
2. Cronbach's $\alpha = .4563$; Standardized item $\alpha = .4565$

Table 18. Correlation matrix of attitude questions.

QUESTION	Q32	Q33	Q38	Q40
Q32	1.000	.1657 ¹	-.1219 ¹	-.1319 ¹
Q33		1.000	.0046	-.4668 ¹
Q38			1.000	.0243
Q40				1.000

Table notes:

1. Significant at the .01 level (2-tailed).
2. Cronbach's $\alpha = -.4605$; Standardized item $\alpha = -.4758$

Table 19. The demographic and socioeconomic characteristics of survey respondents.

VARIABLE	MALE ¹ %	FEMALE ¹ %	TOTAL %
AGE (mean 56.5 yrs) (std dev 17.74)			
<30 years	6.2 ²	8.7 ²	7.4 ²
30 – 39 years	11.0	11.2	11.1
40 – 49 years	21.0	16.8	18.9
50 – 59 years	21.0	17.9	19.4
60+ years	40.8	45.5	43.1
RACE			
Hispanic	1.3	1.4	1.4
White	96.4	95.7	96.0
Black	1.0	.9	.9
Asian/Pacific Islander	.3	.2	.3
American Indian/ Alaskan Native	.4	.5	.5
Other	1.3	.4	.9
EDUCATION			
Grades 1-8	5.0	2.9	4.0
Grades 9-12	6.3	9.7	8.0
High School/GED	26.3	29.9	28.1
College 1-4 years	29.4	28.5	28.9
Associate Degree	8.4	10.7	9.5
College Graduate	24.6	18.4	21.5

Table notes:

1. For males n = 916, for females n = 901.
2. Numbers reported are as a percentage of the total for that gender.

Table 19. continued

VARIABLE	MALE ¹ %	FEMALE ¹ %	TOTAL %
BMI			
<18.5	.9 ²	2.3 ²	1.6
18.5-24.9	28.3	37.4	32.8
25.0-29.9	46.9	32.9	40.0
≥30	23.9	27.4	25.6
EMPLOYMENT			
Full-time	56.8	37.6	47.3
On leave	.5	.6	.6
Part-time	5.8	10.8	8.3
Not employed	4.0	4.7	4.3
In school	.2	1.6	.9
Stay at home	.8	8.5	4.6
Retired	31.9	36.3	34.1
INCOME			
<\$10,000	4.3	11.3	7.8
\$10,000 - 19,999	12.4	20.1	16.2
\$20,000 - 29,999	15.7	18.5	17.1
\$30,000 - 39,999	26.1	26.0	26.0
\$40,000 - 49,999	14.3	8.2	11.3
\$50,000+	27.3	15.8	21.6

Table notes:

1. For males n = 916, for females n = 901.

2. Numbers reported are as a percentage of the total for that gender.

Table 20. A comparison of survey results to census data in each state and community (U.S. Bureau of Census, 1990; U.S. Bureau of Census, 2000).

	Survey Census Data ¹	ID	Idaho Preston	American Falls	MT	Montana Lewistown	Miles City	WY	Wyoming Powell	Torrington
GENDER										
Male	Survey	51.9	49.7	53.5	48.7	48.3	49.2	50.7	49.7	51.7
	Census	50.1	49.0	48.9	49.8	46.7	48.0	50.0	46.1	48.2
Female	Survey	48.1	50.3	45.6	51.3	51.7	50.8	49.3	50.3	48.3
	Census	49.9	51.0	51.1	50.2	53.3	52.0	50.0	53.9	51.8
AGE										
20 – 24	Survey	4.0	6.0	2.0	2.2	2.5	1.9	2.9	2.3	3.4
	Census	7.3	7.5	6.1	6.5	4.6	5.7	6.4	10.7	5.9
25 – 34	Survey	11.6	15.1	8.3	8.1	6.0	10.4	8.3	12.4	4.1
	Census	13.1	12.3	12.9	11.4	9.2	10.9	12.4	10.8	10.0
35 – 44	Survey	13.5	14.1	12.9	13.1	12.9	13.3	14.6	12.1	17.2
	Census	14.9	11.8	12.0	15.7	14.0	15.0	16.1	11.6	13.1
45 – 54	Survey	18.5	16.1	20.8	21.1	21.1	21.0	21.1	19.1	23.1
	Census	13.2	8.9	12.4	15.0	14.2	13.6	15.2	11.4	12.9
55 – 59	Survey	10.0	10.2	10.2	9.9	9.5	10.4	10.7	9.4	12.1
	Census	4.6	3.7	4.2	5.2	4.6	4.6	5.0	4.5	5.7
60 +	Survey	42.1	45.5	45.5	45.4	47.9	42.7	42.0	44.3	39.7
	Census	14.0	17.6	15.9	17.6	27.6	22.6	15.7	22.1	25.5

Table notes:

1. All census data from 2000 Census, unless otherwise noted.

Table 20. continued

	Survey Census ¹ Data	ID	Idaho Preston	American Falls	MT	Montana Lewistown	Miles City	WY	Wyoming Powell	Torrington
RACE ²										
Hispanic	Survey	2.7	1.0	4.3	0.1	0.0	0.3	1.4	1.3	1.4
	Census	7.9	5.0	27.8	2.0	0.7	1.6	6.1	6.8	9.5
White	Survey	93.7	95.3	92.1	96.8	97.2	96.4	97.6	97.0	98.3
	Census	91.0	95.2	81.6	90.6	96.5	96.7	91.5	95.4	93.5
Black	Survey	1.5	1.0	2.0	1.0	0.6	1.3	0.3	0.7	0.0
	Census	0.4	0.1	0.1	0.3	0.1	0.1	0.5	0.1	0.3
Asian/ Pacific Islander	Survey	0.7	0.3	1.0	0.2	0.0	0.3	0.0	0.0	0.0
	Census	1.0	0.2	0.4	0.6	0.3	0.3	0.5	0.4	0.4
American Indian/ Alaskan Native	Survey	1.0	1.3	7.0	0.3	0.3	0.3	0.2	0.3	0.0
	Census	1.4	0.4	1.0	6.2	1.4	1.4	2.2	0.5	0.9
Other	Survey	0.5	1.0	0.0	1.6	1.9	1.3	0.5	0.7	0.3
	Census	4.2	3.1	15.2	0.6	0.1	0.4	2.2	2.5	3.7

Table notes:

1. All Census data from 2000 census, unless otherwise noted.

2. The percentages may add to more than 100 percent because individuals may report more than one race.

Table 20. continued

	Survey Census ¹ Data	ID	Idaho Preston	American Falls	MT	Montana Lewistown	Miles City	WY	Wyoming Powell	Torrington
EDUCATION										
Grades 1-8	Survey	3.3	4.6	2.0	4.2	4.4	3.9	4.4	3.7	5.2
	Census	4.5	4.6 ³	15.1 ³	4.3	11.1 ³	11.0 ³	2.8	8.4 ³	11.5 ³
Grades 9 – 12	Survey	10.5	11.9	9.1	5.3	5.0	5.5	4.4	7.0	9.7
	Census	9.0	17.3 ³	13.3 ³	10.0	11.9 ³	11.0 ³	9.4	14.8 ³	12.0 ³
High School Graduate	Survey	29.6	26.4	32.9	30.0	32.5	27.5	8.3	20.1	29.0
	Census	31.3	36.9 ³	30.2 ³	30.5	38.9 ³	32.1 ³	30.7	23.7 ³	31.9 ³
College 1-4 yrs	Survey	33.3	34.0	32.6	28.8	30.6	26.9	24.7	26.2	23.1
	Census	25.8	20.8 ³	21.6 ³	24.6	18.2 ³	20.4 ³	25.8	24.9 ³	23.0 ³
Associate Degree	Survey	7.5	6.3	8.7	10.4	7.6	13.3	10.5	13.4	7.6
	Census	8.0	6.8 ³	7.6 ³	5.1	6.0 ³	9.0 ³	7.3	8.9 ³	6.8 ³
College Graduate	Survey	15.8	16.8	14.8	21.4	19.9	23.0	27.6	29.5	25.5
	Census	21.5	13.6 ³	12.2 ³	25.6	14.0 ³	16.5 ³	24.0	19.3 ³	14.7 ³

Table notes:

1. All census data from 2000 census, unless other wise noted.
3. 1990 census data.

Table 20. continued

	Survey Census ¹ Data	ID	Idaho Preston	American Falls	MT	Montana Lewistown	Miles City	WY	Wyoming Powell	Torrington
EMPLOYMENT										
Employed	Survey	57.4	58.1	56.8	46.2	51.1	59.9	55.4	54.4	56.6
	Census	63.2	52.9 ³	60.4 ³	61.8	53.0 ³	59.5 ³	65.9	57.0 ³	56.0 ³
Not Employed	Survey	42.6	41.9	43.2	44.6	48.9	40.1	44.6	45.6	43.4
	Census	36.8	47.1 ³	39.6 ³	38.7	47.0 ³	40.5 ³	34.1	43.0 ³	44.0 ³
INCOME										
< \$10,000	Survey	6.2	6.0	6.3	10.2	10.7	9.7	6.8	5.4	8.3
	Census	8.2	16.3 ³	17.5 ³	19.9	21.2 ³	23.2 ³	15.9 ³	16.8 ³	24.1 ³
\$10,000 – 49,999	Survey	73.0	73.8	72.3	70.3	71.3	69.3	68.5	72.5	64.5
	Census	57.7	76.2 ³	70.2 ³	67.0	68.8 ³	68.9 ³	66.6 ³	73.6 ³	65.4 ³
> \$50,000	Survey	20.8	20.1	21.5	19.5	18.0	21.0	24.7	22.1	27.2
	Census	34.1	7.5 ³	12.3 ³	13.1	9.3 ³	7.9 ³	17.6 ³	9.7 ³	10.5 ³

Table notes:

1. All census data from 2000 census, unless other wise noted.
3. 1990 census data.

Table 21. The dietary habits of the sample compared to demographic and socioeconomic variables.

VARIABLE	DIETARY HABITS		
	Healthy (>43) ¹	Neutral (23 – 43) ¹	Unhealthy (≤22) ¹
GENDER			
Male	8 ² (20.5) ³	761 (49.0)	147 (65.3)
Female	31 (79.5)	792 (51.0)	78 (34.7)
AGE			
<30 years	0 (0.0)	85 (5.5)	50 (22.2)
30 – 39 years	1 (2.6)	142 (9.1)	59 (26.2)
40 – 49 years	3 (7.7)	284 (18.3)	56 (24.9)
50 – 59 years	6 (15.4)	316 (20.3)	31 (13.8)
60+ years	29 (74.4)	726 (46.7)	29 (12.9)

Table notes:

1. For healthy diet n = 39, average diet n = 1553, unhealthy diet n = 225.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each dietary habits category, (%).

Table 21. continued

VARIABLE	DIETARY HABITS		
	Healthy (>43) ¹	Neutral (23 – 43) ¹	Healthy (>43) ¹
RACE			
Hispanic	0 ² (0.0) ³	16 (1.0)	9 (4.0)
White	38 (97.4)	1501 (96.7)	206 (91.6)
Black	1 (2.6)	12 (0.8)	4 (1.8)
Asian/Pacific Islander	0 (0.0)	3 (0.2)	2 (0.9)
American Indian/ Alaskan Native	0 (0.0)	3 (0.2)	2 (0.9)
Other	0 (0.0)	13 (0.8)	3 (1.3)
EDUCATION			
Grades 1-8	0 (0.0)	65 (4.2)	7 (3.1)
Grades 9-12	3 (7.7)	126 (8.1)	16 (7.1)
High School/GED	11 (28.2)	426 (27.4)	73 (32.4)
College 1-4 years	11 (28.2)	441 (28.4)	74 (32.9)
Associate Degree	1 (2.6)	138 (8.9)	34 (15.1)
College Graduate	13 (33.3)	357 (23.0)	21 (9.3)

Table notes:

1. For healthy diet n = 39, average diet n = 1553, unhealthy diet n = 225.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each dietary habits category, (%).

Table 21. continued

VARIABLE	DIETARY HABITS		
	Healthy (>43) ¹	Neutral (23 – 43) ¹	Healthy (>43) ¹
BMI			
<18.5 (underweight)	2 ² (5.1) ³	25 (1.6)	2 (0.9)
18.5-24.9 (normal)	17 (43.6)	506 (32.6)	73 (32.4)
25.0-29.9 (overweight)	13 (33.3)	626 (40.3)	87 (38.7)
≥30 (obese)	7 (17.9)	396 (25.5)	63 (28.0)
EMPLOYMENT			
Full-time	7 (17.9)	687 (44.2)	165 (73.3)
On leave	0 (0.0)	9 (0.6)	1 (0.4)
Part-time	3 (7.7)	126 (8.1)	21 (9.3)
Not employed	3 (7.7)	71 (4.6)	5 (2.2)
In school	0 (0.0)	9 (0.6)	7 (3.1)
Stay at home	1 (2.6)	78 (5.0)	5 (2.2)
Retired	25 (64.1)	573 (36.9)	21 (9.3)

Table notes:

1. For healthy diet n = 39, average diet n = 1553, unhealthy diet n = 225.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each dietary habits category, (%).

Table 21. continued

VARIABLE	DIETARY HABITS		
	Healthy (>43) ¹	Neutral (23 – 43) ¹	Unhealthy (≤22) ¹
INCOME			
<\$10,000	4 ² (10.3) ³	123 (7.9)	14 (6.2)
\$10,000 - 19,999	9 (23.1)	255 (16.4)	31 (13.8)
\$20,000 - 29,999	9 (23.1)	256 (16.5)	46 (20.4)
\$30,000 – 39,999	9 (23.1)	403 (25.9)	61 (27.1)
\$40,000 – 49,999	3 (7.7)	173 (11.1)	29 (12.9)
\$50,000+	5 (12.8)	343 (22.1)	44 (19.6)

Table notes:

1. For healthy diet n = 39, average diet n = 1553, unhealthy diet n = 225.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each dietary habits category, (%).

Table 22. The attitude toward the body image of others compared to demographic and socioeconomic variables.

VARIABLE	ATTITUDE		
	Positive (≥ 16) ¹	Neutral (8 - 15) ¹	Negative (< 8) ¹
GENDER			
Male	6 ² (37.5) ³	890 (49.7)	5 (45.5)
Female	10 (62.5)	900 (50.3)	6 (54.5)
AGE			
<30 years	1 (63)	133 (7.4)	1 (9.1)
30 - 39 years	3 (18.8)	198 (11.1)	1 (9.1)
40 - 49 years	1 (6.3)	339 (18.9)	3 (27.3)
50 - 59 years	4 (25.0)	348 (19.4)	1 (9.1)
60+ years	7 (43.8)	772 (43.1)	5 (45.5)

Table notes:

1. For positive attitude n = 11, neutral attitude n = 1790, negative attitude n = 16.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each attitudinal category, (%).

Table 22. continued

VARIABLE	ATTITUDE		
	Positive (≥ 16) ¹	Neutral (8 – 15) ¹	Positive (≥ 16) ¹
RACE			
Hispanic	0 ² (0.0) ³	24 (1.3)	1 (9.1)
White	16 (100.0)	1719 (96.0)	10 (90.9)
Black	0 (0.0)	17 (0.9)	0 (0.0)
Asian/Pacific Islander	0 (0.0)	5 (0.3)	0 (0.0)
American Indian/ Alaskan Native	0 (0.0)	9 (0.5)	0 (0.0)
Other	0 (0.0)	16 (0.9)	0 (0.0)
EDUCATION			
Grades 1-8	0 (0.0)	70 (3.9)	2 (18.2)
Grades 9-12	2 (12.5)	143 (8.0)	0 (0.0)
High School/GED	4 (25.0)	503 (28.1)	3 (27.3)
College 1-4 years	5 (31.3)	520 (29.1)	1 (9.1)
Associate Degree	1 (6.3)	170 (9.5)	2 (18.2)
College Graduate	4 (25.0)	384 (21.5)	3 (27.3)

Table notes:

1. For positive attitude n = 11, neutral attitude n = 1790, negative attitude n = 16.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each attitudinal category, (%).

Table 22. continued

VARIABLE	ATTITUDE		
	Positive (≥ 16) ¹	Neutral (8 – 15) ¹	Positive (≥ 16) ¹
BMI			
<18.5 (underweight)	0 ² (0.0) ³	29 (1.6)	0 (0.0)
18.5-24.9 (normal)	7 (43.8)	585 (32.7)	4 (36.4)
25.0-29.9 (overweight)	6 (37.5)	715 (39.9)	5 (45.5)
≥ 30 (obese)	3 (18.8)	461 (25.8)	2 (18.2)
EMPLOYMENT			
Full-time	7 (43.8)	849 (47.4)	3 (27.3)
On leave	0 (0.0)	10 (0.6)	0 (0.0)
Part-time	2 (12.5)	147 (8.2)	1 (9.1)
Not employed	1 (6.3)	78 (4.4)	0 (0.0)
In school	0 (0.0)	15 (0.8)	1 (9.1)
Stay at home	0 (0.0)	83 (4.6)	1 (9.1)
Retired	6 (37.5)	608 (34.0)	5 (45.5)

Table notes:

1. For positive attitude $n = 11$, neutral attitude $n = 1790$, negative attitude $n = 16$.
2. Data reported by number in each cell, n .
3. Data reported by percentage of each attitudinal category, (%).

Table 22. continued

VARIABLE	ATTITUDE		
	Positive (≥ 16) ¹	Neutral (8 - 15) ¹	Positive (≥ 16) ¹
INCOME			
<\$10,000	1 ² (6.3) ³	137 (7.7)	3 (27.3)
\$10,000 - 19,999	3 (18.8)	290 (16.2)	2 (18.2)
\$20,000 - 29,999	2 (12.5)	308 (17.2)	1 (9.1)
\$30,000 - 39,999	6 (37.5)	466 (26.0)	1 (9.1)
\$40,000 - 49,999	2 (12.5)	203 (11.3)	0 (0.0)
\$50,000+	2 (12.5)	386 (21.6)	4 (36.4)

Table notes:

1. For positive attitude n = 11, neutral attitude n = 1790, negative attitude n = 16.
2. Data reported by number in each cell, n.
3. Data reported by percentage of each attitudinal category, (%).

Table 23. A partial correlation matrix of the independent variables.

VARIABLE	Maint	Action	Prep	Contem	Precon	Female	Age	White
Maint	1.000	.602 ¹	-.368 ¹	-.335 ¹	-.393 ¹	-.107 ¹	-.040	.035
Action		1.000	-.099 ¹	-.090 ¹	-.106 ¹	.076 ¹	.088 ¹	-.040
Prep			1.000	-.055 ¹	-.065 ¹	.030	-.072 ¹	-.035
Contem				1.000	-.059 ²	.061 ¹	-.091 ¹	.006
Precon					1.000	.011	.098 ¹	.019
Female						1.000	.055 ²	-.019
Age							1.000	.090 ¹
White								1.000

Table notes:

1. Correlation is significant at the .01 level (2-tailed).
2. Correlation is significant at the .05 level (2-tailed).

Table 23. continued

VARIABLE	HS or Less	Some College	College Degree	BMI	Employed	Retired	Not Employed	Income ≥\$30K
HS or Less	1.000	-.646 ¹	-.428 ¹	.006	-.263 ¹	.269 ¹	.010	-.247 ¹
Some College		1.000	-.414 ¹	.014	.133 ¹	-.201 ¹	.074 ¹	.028
College Degree			1.000	-.023	.156 ¹	-.083 ¹	-.100 ¹	.261 ¹
BMI				1.000	.074 ¹	-.067 ¹	-.013	-.010
Employed					1.000	-.681 ¹	-.453 ¹	.269 ¹
Retired						1.000	-.344 ¹	-.214
Not Employed							1.000	-.085
Income ≥\$30K								1.000

Table notes:

1. Correlation is significant at the .01 level (2-tailed).
2. Correlation is significant at the .05 level (2-tailed).

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