

Predictors of Susceptibility
to the Diet and Nutrition Media

by

Shelagh Robinson ©

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Supervisor: Dr. John Jamieson

Second Reader: Dr. Norm Lavoie

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Abstract

Much of the information distributed by the diet and nutrition media consists of unsubstantiated claims. Individuals who are particularly susceptible to such sources are at risk for practicing food-related behaviours of questionable benefit and potential harm. The present study examined whether individuals high in dietary restraint, as measured by the Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985), or with an external locus of control as measured by the Weight Locus of Control Scale (Saltzer, 1982) might be particularly susceptible to this information. Four scales were used to measure different aspects of susceptibility to the diet and nutrition media. These measures assessed the credibility given to commercial sources and to a wider range of sources of health information (Worsley, 1989), beliefs about the effects of food on behaviour (Wisocki & King, 1992), and surveyed questionable eating behaviours in a measure which was developed for this study.

One hundred and forty-seven female university students completed these questionnaires and kept a 3-day record of their food and beverage consumption. The Cognitive Restraint scale of the TFEQ was significantly associated with a range of questionable eating behaviours (e.g. fad diets). However, neither dietary restraint nor locus of control were predictive of

perceived credibility of sources of health information, nor of beliefs about the effects of foods on behaviour. These findings do not identify a clear profile of individuals who are particularly susceptible to food-related information. Only the Hunger Susceptibility scale of the TFEQ was related to the major food consumption measures (calories, carbohydrates and fats).

Introduction

The media, in its many forms, are powerful influences upon the beliefs and behaviours of individuals. Television programs, newspapers and books are filled with information on nutrition and weight regulation, and numerous advertisements endorse products to promote health and assist dieting. However, some distributors of health and nutrition information are more concerned with profits than product benefit or safety. The public may be at risk for utilizing health and nutrition claims which do not work and which may even be dangerous.

Little research has been directed at identifying predictors of susceptibility to the diet and nutrition media. One goal of the present study was to examine the relationship of susceptibility to two psychological constructs: dietary restraint as measured by the Three Factor Eating Questionnaire (TFEQ) and locus of control as measured by the Weight Locus of Control Scale (WLOCS). The second goal was to determine whether these constructs, and the susceptibility measures, would be predictive of actual eating behaviours.

Questionable Food Beliefs and Myths

"The field of nutrition has been, and remains, particularly susceptible to distortion and faddism . . . given the perceived

association of food with health, it has been easy to exploit this concept for the marketing purposes of foods and interventions." (Story & Rosen, 1987, p. 811)

Eating Behaviours are being increasingly implicated in the general health status of individuals (Simmons, 1989). Poor dietary habits have an adverse effect upon a wide variety of health and disease states, including the aetiology of coronary heart disease (CHD), diabetes (Harrison & Winston, 1982; Thompson, Sowers, Frongillo & Parpia, 1992), and osteoporosis (Nissinen & Stanley, 1989). Excess sodium has been found to cause or aggravate hypertension, (Harrison & Winston); low levels of dietary iron cause anemia (Dallman, Siimes & Stekel, 1980); and folate deficiencies can result in depression (Reynolds, Toone, & Carny, 1984).

Research has also reliably shown that certain foods or food constituents can have specific *behavioural effects*. Consuming foods high in sugar has been found to increase energy level (Thayer, 1987) and carbohydrates have been found to influence subjective states of calmness and fatigue (Spring, Maller, Wurtman, Digman & Cozolina, 1983; Spring, Chiodo & Bowen, 1987). As well, caffeine administration to depressed individuals produces temporary enhancement of energy and concentration (Neil, 1978).

Popular culture also persists in extolling the unverified positive effects

of certain foods. Common mythology suggests that 'an apple a day keeps the doctor away,' and that feeding a cold is beneficial, as is starving a fever. Grapefruit juice purportedly promotes weight loss, spinach makes one strong, warm milk will bring on sleep and ginseng will eliminate premenstrual depression. The common factor in these claims is that they are passed on from person to person, often with little or no supporting evidence.

Dwyer (1993) has studied such food myths and regimes, calling them Questionable Nutritional Remedies (QNRs). She defines QNRs as non-clinically sanctioned practices which are believed to prevent, diagnose or treat health problems. QNRs are used to treat a variety of symptoms from fatigue and dysphoria to premenstrual syndrome, joint dysfunction, cancer and weight gain. These questionable treatments may take numerous forms including severe fasting, mega-doses of vitamins and minerals, tonics, food combining, and highly restrictive diets. Although there is physiological evidence to support some QNRs, others are wholly inaccurate, and may be injurious as often as they are beneficial. Consumers face difficulties determining the difference between legitimate nutritional information, and those claims which are unsubstantiated. Numerous studies (e.g. McKie, Wood & Gregory, 1993) document concern and frustration regarding conflicting health and diet advice. Great numbers of nutrition-related endorsements are constantly released and

health professionals are challenged to stay abreast of what is truth and what is fiction. The absence of documentation regarding the veracity of many of these claims has resulted in a lack of consensus of what constitutes valid health and nutritional regimens and has led to inconsistent health counsel. This, in turn, has spawned a flourishing, competing and often contradictory health, nutrition and diet information network which further contributes to consumer confusion (McKie et al.).

Dieting has become a pervasive pastime in western cultures, in part because health and nutrition have been adopted as central features in the marketing strategies for big business (Nash & McIntyre, 1987). Dieting has become a "cultural preoccupation" (Nasser, 1988, p. 574). At any given time, 20% of men and 38% of women say they are currently on a diet (Cash, 1986), and three quarters of all female college students have dieted to control their weight (Jacobovits, Halstead, Kelley, Roe & Young, 1977). Dieting is so common a habit that it has become known as *normal* eating (Herman, Polivy & Esses, 1987).

The goal of losing weight has been built into an eminently marketable and profitable industry; there is great money-making potential in providing theories or products to assist weight loss. Western consumers' thin obsession is evidenced by the massive increase in the articles and advertisements on

dieting and slimming in women's magazines and other media, as well as the high numbers of establishments expressly built for weight loss purposes (Nasser, 1988). Garner et al., (1980) note a rise in diet articles in popular magazines, and Dwyer (1980) comments on the prevalence of faddish dietary regimes and surfeit of products designed for the 'calorie counter.' The potential profits inherent in the weight-loss industry are considerable, and unscrupulous marketeers find ample opportunity to endorse dubious products and practices in order to make money.

To sell their health and diet products, advertisers and manufacturers must be able to reach specific populations which will be amenable to their nutrition and diet suggestions. Pasadeos (1987) states that the base upon which solid marketing plans are founded is "appropriate market segmentation," (p. 43) or determining the consumer group specific to the product offered. The targeted consumer group for the majority of diet/ health/ nutrition products is young women. Studies (e.g. Sims, 1976) have shown that unmarried women under the age of thirty-five and of upper socioeconomic status are more likely than other individuals to be concerned with, and seek out, health and nutrition-related information. This same population, is, correspondingly, the one found to have the highest incidence of eating and dieting disorders (e.g. Simmons, 1989; Wardle & Beinhart, 1981; Polivy &

Herman, 1985; Rand, 1991). Manufacturers interested in gaining the attention of this population spend large amounts of money to access the types of media that may be most relevant to young women, i.e., fashion magazines, health and nutrition programmes, and television.

Measures of Susceptibility to the Media

The media are integral and influential parts of modern culture. People look to television, radio, and newspapers not only as sources of information but as guides for behaviour and models for living. The media have become an indispensable part of the health and nutrition practices of many people as it increases exposure to new ideas and aids in the translation of suggestions into behaviours. Problems arise, however, when unsubstantiated and potentially dangerous food-related claims become incorporated into personal belief systems and influence purchasing and eating patterns.

Much of the power the media possesses rests upon its ability to distribute information that is accurate and helpful, or upon its credibility. Recognizing the credibility of sources of health and nutrition information aids consumers in deciding which ideas should be practically applied. Information sources which are perceived by consumers to be trustworthy are assessed as highly credible, and in general, people are more likely to believe or practice suggestions provided by information sources of high credibility. Large

numbers of people, however, are known to practice questionable food-related behaviours purveyed by the diet and nutrition media, regardless of the reliability of the source (Dwyer, 1993).

Measuring susceptibility to the diet and nutrition media is a task that has rarely been undertaken, and as a consequence, a review of the literature uncovered no assessment tools specifically designed to measure such a construct. For the present study, it was necessary to utilize four alternative measures which were selected on the rationale that each operationalized an aspect of susceptibility to the diet and nutrition media.

Worsley (1989) developed the perceived reliability of Sources of Health Information (SHI) questionnaire in order to assess consumers' beliefs about sources of nutrition information. This scale ranks seventeen sources of nutritional information from low to high credibility. Worsley found that the family doctor was most often consulted for reliable health and nutrition information, then pharmacists, health and medical books, and nurses. Chiropractors, natural therapists, fitness instructors, children, best friends and family members were perceived as dubious sources of nutritional information by approximately one third of the subjects. Cookbooks were regarded as less credible than health food shop personnel, and television commercials were rated as having the lowest reliability of all. Worsley suggests the use of a

COMMERCIAL subscale to identify sources whose reasons for distributing information are primarily profit-motivated. These sources consist of health food shop personnel, magazine articles, newspaper articles, television commercials, health/ medical books, cookbooks, and other friends.

A second measure, the Food Behaviour Inventory (FBI) was developed by Wisocki and King (1992) to study attributions people make about the effects of the consumption of different foods. A 14-item portion of their survey focuses upon general beliefs about the effects of foods on behaviour. Results of Wisocki and King's study show that many of their subjects believed that hyperactivity could be produced or aggravated by sugar; that depression, irritability, fatigue and tension could be caused by food allergies; and that menstrual symptoms could be affected by the foods women eat. These findings indicate that beliefs in food effects upon behaviour are common among students. Wisocki and King note that some of the attributions they recorded about food's effects on behaviour have little empirical validity.

The final outcome measure, the Survey of Eating Behaviours (SEB) was developed for this study in order to identify individuals who engage in questionable eating-related behaviours. In the absence of any devices specifically developed to assess susceptibility to the diet and nutrition media, the present study utilized the above measures with the rationale that each

captured a component of susceptibility.

Predictors of Susceptibility

Dietary Restraint

The theory of restraint represents an important development in the prediction of eating behaviour and disordered eating patterns (Johnson et al., 1983). Restraint has been defined as the deliberate attempt by an individual to lower or maintain body weight (Laessle, Tuschl, Kotthaus & Pirke, 1989). Restraint theory proposes that eating behaviour is a balance between the competing physiological desires to eat and to resist eating (restraint).

Restraint differs from dieting in that restraint is a "subclinical eating disorder punctuated by episodic bingeing and purging, chronic dietary awareness, and caloric deprivation" (Herman & Mack, 1975, p. 365). Restraint requires, by definition, fluctuations in weight brought on by bingeing after caloric restriction is undermined, often called the "what the hell effect" (Herman & Polivy, 1984). Because restraint is considered a subclinical eating disorder, it occurs along the continuum of disordered eating (Garner, Olmstead, & Garfinkel, 1983; Patton, 1992), with dieting constituting the 'mild' pole of the spectrum and behaviours such as anorexia and bulimia nervosa making up the other end.

Many studies (e.g. Etringer et al., 1989; Nagelberg et al., 1984) have found that dietary restraint was predictive of poor nutritional practices. These studies examined the relationship between restrained eating and unhealthy behaviours such as overeating, frequent laxative use and vomiting. Tuschl (1990) studied the food records of restrained and unrestrained eaters and found that, as a group, restrained eaters experienced more planned days of 'semi-starvation,' had a higher consumption of low calorie foods, possessed higher triglyceride levels, and on average ate approximately 400 fewer kilocalories per day than unrestrained eaters. Furthermore, Tuschl showed that restrained individuals were also less likely to eat a balanced diet or consume the recommended daily allowance of specific food nutrients.

Measures of Dietary Restraint

Numerous studies (e.g. Etringer et al., 1989; Nagelberg et al., 1984; Tuschl, 1990) have shown that dietary restraint is a determinant of food-related behaviours and has been instrumental in furthering an understanding of the variables which impact upon eating patterns. The construct's measurement has, therefore, been the subject of considerable research and debate. As knowledge in the area expanded, improvements were made upon Herman and Mack's original 10-item Restraint Scale (1975). Currently, one of the most widely used measures of restraint is the Three Factor Eating Questionnaire

(TFEQ; Stunkard & Messick, 1985).

The TFEQ is comprised, in part, of items from Herman and Polivy's (1980) Restraint Scale and contains three distinct factors to measure Cognitive Restraint (CR), Disinhibition (DI) and Hunger Sensitivity (HS). Collins et al. (1992) support the "TFEQ's usefulness for studying the multifaceted construct of eating restraint," (p. 48) as each of the factors measures a unique dimension of behaviours and cognitions associated with dietary restraint.

Laessle et al. (1989) suggest that if dietary restraint is used as a construct to assess the biological or psychobiological consequences of restricted food intake and altered eating patterns in everyday life, the TFEQ appears to be an appropriate tool for identifying subjects who may be at risk. The TFEQ appears to be the best device measuring restraint, in part because the identification of the three components within the larger restraint construct "represents a further step in the development of psychometric instruments for the study of eating behaviours" (Stunkard & Messick, 1985, p. 78). Pitre and Nicky (1992) substantiate this claim, noting that there were significant differences between dieters (restrained eaters) and "free eaters" on scores for all three factors.

Because dietary restraint is a construct composed of both cognitions and behaviours, many studies suggest the use of all three factors (e.g. Westerterp

et al., 1988; Lowe & Maycock, 1988; Simmons, 1990; Collins et al., 1992) to assess the unique components of restrained eating behaviours. The first factor, Cognitive Restraint, represents the deliberate restriction of caloric intake. A high score on the CR factor indicates strong levels of deliberate dietary restriction. The second factor, Disinhibition (DI), identifies the tendency to lose control over consumption, or the inhibition of restraint. High scores on this factor suggest greater degrees of disinhibited eating and weight lability. The availability of palatable foods, proximity to others who are eating, and emotional distress have all been implicated in the disinhibition of dietary restraint (Lowe & Maycock, 1988). The Hunger Sensitivity (HS) factor describes the intensity with which hunger sensations are perceived, hypersensitivity to feelings of hunger which elicit eating after prolonged restraint, and the extent to which such sensations elicit eating (Lowe & Maycock, 1988). Used in tandem, all three subscales of the TFEQ combine to provide a conceptually sound, internally consistent self-report measure which provides an effective means for "studying the multifaceted construct of eating restraint." (Collins et al., 1992, p. 49).

Dietary Restraint and Susceptibility

There are a number of reasons to suspect that individuals who are restrained eaters will be particularly susceptible to health and nutrition

information in the media. One reason is based on the finding that restrained individuals are particularly responsive to food-related stimuli in the environment. These cues include time of day, watching someone else eat, and the proximity of food (Stunkard & Messick, 1985). Other studies (e.g. Klajner et al., 1981; Sahakian, 1981; Garcia, 1985) have shown that restrained eaters have greater salivation responses to the sight and smell of food.

It has also been shown that individuals who are restrained are more likely than unrestrained people to pay attention to food-related messages. Laessle et al. (1988) note that severely restrained individuals "collect and read literature relating to food and body function. . . and appear extremely interested in dietary matters" (p. 63). Neimeyer et al. (1989) studied the effects of message strength and source characteristics upon the attitude change of high and low restrained eaters. They found that highly restrained individuals are more likely to pay attention to message content as opposed to message source than individuals with low restraint. Furthermore, Neimeyer et al.'s data showed that higher degrees of restraint were linked with greater positive cognitive responses to messages. These findings suggest that highly restrained individuals are more likely to be aware of the content of messages that are of relevance to them (e.g. food-oriented) and are less likely to care about the credibility of the information source. Finally, an exaggeration of the

responsiveness to nutritional or food-related stimuli has been observed in restrained eaters (Klajner et al., 1981; LeGoff & Spigelman, 1987) and may be relevant to the "disinhibition" phenomena, the compromise of cognitive control. Laessle et al. (1989) state that "a permanently heightened attractiveness of nutritional or food-related stimuli may be the consequence of cognitively controlled eating" (p. 90). As well, Heatherton et al. (1989) note that it is prudent to conclude that most people's eating is affected by external or cognitive cues, but that non-dieters (and likely non-restrained eaters) may also take variations in internal state into account. In other words, restrained eaters are less likely to regulate their eating according to physiological cues than environmental ones, in comparison to non-restrained eaters.

Of all the measures of dietary restraint, therefore, the Three Factor Eating Questionnaire appears to be, by virtue of its factor structure, the instrument most sensitive to hyperresponsivity to food-related stimuli in restrained eaters. Stunkard & Messick (1985) suggest that individuals with high scores on the TFEQ's Cognitive Restraint factor may be "unusually responsive to information regarding caloric content of foods, nutrition, and particularly about traditional behavioral strategies for stimulus control." (p. 79) This implies that individuals scoring high on the CR factor may be more likely to be aware of, and susceptible to, a variety of food-related messages. Rodin

& Slochower (1976) suggest a relationship between the HS factor of the TFEQ and external locus of control, noting that externality has been linked to sensitivity to feelings to palatable foods eliciting heightened eating responses. Thus, it is possible that the HS factor may reflect enhanced internal responses to palatable foods.

In summary, dietary restraint, as measured by the TFEQ, has been shown to be a strong predictor of eating behaviours. Restraint has been linked to poor nutritional practices, hyperawareness to food-related stimuli, and decreased perception of the importance of the sources of food-related messages in relation to message content. Because Cognitive Restraint, Disinhibition and Hunger Susceptibility have all been related to eating behaviours, all three TFEQ subscales were examined in the present study.

Locus Of Control

The construct of Locus of Control (LOC) was originally developed by Rotter (1966) to indicate the extent to which individuals perceive personal actions to be instrumental in effecting change, or the degree to which they perceive experiences to be attributable to luck or fate. Since Rotter, the construct of LOC has been applied to a wide variety of human behaviours including eating disorders and weight control.

Studies have shown that locus of control is related to eating behaviours.

Numerous studies (e.g. Williams, Chamove, Millar & Henry, 1990; Grace, 1985) have shown that individuals who are eating disordered possess external beliefs, i.e. they feel they have little control over their own weight. As well, Rodin and Slochower (1976) report that externality predicts emotionality and sensitivity to food cues. Furthermore, Ross, Kalucy and Morton (1983) demonstrated that high internal locus of control in women is related to greater rates of success in weight maintenance. Generally, researchers have found that as the severity of eating disorders increase, so does external LOC, or a person's belief that their eating patterns are subject to external influences over which they have little or no control.

As exploration of the relationship between LOC and eating patterns advanced, a need emerged for scales which specifically measured locus of control as it pertained to eating behaviours. Different versions of LOC scales were developed to assess subjective impressions of control related to weight concerns. Reid and Ware's (1974) 32-item, forced choice, multi-dimensional Internal- External Locus of Control Scale (I-ELOCS) was developed from Rotter's original questionnaire to assess beliefs about subjective control of weight regulation. Using the I-ELOCS, Hood, Moore and Garner (1982) demonstrated that external LOC is higher among dieting than non-dieting individuals.

Williams et al., (1987) used a 16-item variation of a scale developed by Ross et al., (1983), deliberately selecting items predictive of weight-related behaviours. Williams et al., demonstrated that highly external LOC scores were related to restrained eating practices and predicted overeating. Saltzer (1982) developed a four-item Weight Locus of Control Scale (WLOCS), and in an assessment of individuals enrolled in a weight loss program, the WLOCS predicted that 'internals' were more likely than 'externals' to complete the program and to achieve their weight loss goals (Saltzer, 1982).

Research has shown, therefore, that locus of control is predictive of caloric intake and weight regulation. People with external LOC relinquish personal responsibility for their own weight regulation and attribute difficulties with diet and nutrition to influences outside themselves. Individuals with high external LOC expect diet assistance to come not from inner strength but from external forces. Examples of such external forces include information from experts and powerful diet aids. Persons with external LOC may be particularly open and susceptible to information about food and nutrition. However, previous research does not appear to have examined whether external LOC is associated with greater susceptibility to the nutrition and diet media.

The Present Study

The media have been shown to have powerful influences upon people's eating-related belief systems and behaviours. This is demonstrated by studies (e.g. Sims, 1976) which show that some populations (i.e. young women) are inordinately aware of food-oriented messages, even dubious ones. Restrained eaters and individuals with high levels of external locus of control are two groups with characteristics which might increase their susceptibility to the media's food-related messages. However, there has been little research assessing how dietary restraint or locus of control affect susceptibility to the diet and nutrition media.

The present study evaluated whether dietary restraint and external locus of control were predictive of aspects of susceptibility to the diet and nutrition media as measured by the SHI and its COMMERCIAL subscale, the FBI and the SEB. As well, the questionnaire variables were assessed for their ability to anticipate actual dietary intake, specifically consumption of calories, carbohydrates, fats, fibre, and percentage of total fat.

In order to assess the relationship between psychological factors and dietary habits, it was necessary to measure actual eating patterns. Most measurements of eating behaviours utilize self-report formats and food diaries. While this method has the shortcoming of requiring accurate self-reports, data-collection of this sort is widely used and appeared to be the best available

method of assessment (Morgan, Johnson, Pizek, Reise & Stamply, 1987).

Computer software packages have been designed to analyze food and beverage consumption for fat and recommended nutrient intake. One software package used for diet assessment is the West Diet Analysis '91 (West Educational Publishing, 1992) program. It was designed to analyze nutritional intake and activity level while comparing dietary intake to a recommended standard. Nutrition analysis consists of the recording of all foods and beverages, and their quantities, consumed over a three-day period. Each item is then given a reference code as provided by the program, all of which are keyed into the computer along with activity level. The resulting printout gives an evaluation and percentage of recommended daily allowances of dietary components including total consumption of calories, carbohydrates, fibre, percentage of fat intake and a variety of vitamins and minerals.

Method

Subjects

One hundred and forty-seven female Introductory Psychology students at Lakehead University were used as subjects. Participation was limited to females in order to provide a homogeneous sample and because this population is more susceptible to eating disorders (e.g. Simmons, 1976, Wardle &

Beinhart, 1981; Polivy & Herman, 1985, Rand, 1991). Furthermore, participation was restricted to individuals between the ages of 18 and 25. Participation was voluntary and anonymous, and all subjects were given credit of two marks (two percent) toward their final grade in Introductory Psychology. As further incentive for participation, subjects were offered, at the end of the study, an assessment of their three-day diet record, broken down into percentages of nutrients, protein, carbohydrates and fats.

Apparatus

Five questionnaires were used: the Three Factor Eating Questionnaire (Stunkard & Messick, 1985), the Weight Locus of Control Scale (WLOCS; Saltzer, 1978), the Food Behaviour Inventory (FBI; Wisocki & King; 1992), the perceived reliability of Sources of Health Information (SHI; Worsley, 1989), and a Survey of Eating Behaviours (SEB) which was developed for this study. In addition, participants completed a demographic information sheet consisting of age, height, weight, activity level and current diet status.

The Three Factor Eating Questionnaire (TFEQ) consists of 51 items answered on a 5 point scale from 1 'never' to 5 'always.' The TFEQ measures three dimensions of eating: Cognitive Restraint, Disinhibition of Control, and Hunger Susceptibility (Stunkard, 1981; Stunkard & Messick, 1985) with reliability alphas ranging from .79 to .93.

The Weight Locus of Control Scale (WLOCS; Saltzer, 1978) consists of 4 items each answered on a 6-point Likert Scale format from 1 'strongly disagree' to 6 'strongly agree.' The possible range of scores on this scale is from 4 (maximum internal) to 24 (maximum external). The WLOCS has a somewhat low test-retest reliability of .67 (Saltzer, 1982) but is reported to be of greater utility for predicting weight control (Saltzer, 1982) than Rotter's (1966) I-E Scale, Wallston et al's (1976) HLC-10 Scale, or Wallston, Wallston, and DeVellis (1978) Multidimensional Health Locus of Control Scale (MHLC).

The Food Behaviour Inventory (FBI; Wisocki & King, 1992) is a 14-item questionnaire assessing the degree to which individuals hold general beliefs regarding how the consumption of specific foods can affect behaviour. The FBI uses a 5-point Likert Scale format, with 1 indicating 'strongly agree' and 5 indicating 'strongly disagree.' This instrument was taken from the larger Survey of Student Beliefs About the Effects of Food on Behaviour (Wisocki & King, 1992).

The perceived reliability of Sources of Health Information (SHI; Worsley, 1989) questionnaire consists of 17 sources of nutritional information which are rated on their degree of credibility. The device utilizes a 7 point Likert Scale format with each item rated from 1 'very unreliable' to 7 'very

reliable.' Worsley, using factor analysis, identified a group of sources whose motivation for purveying information was primarily profit-motivated. These sources were "health food shop personnel," "magazine articles," "newspaper articles," "television commercials," "other friends," "health/ medical books" and "cookbooks." For the purposes of the present study, a score was obtained by summing these items to make a COMMERCIAL scale. A high score on this scale indicates that these commercial sources of information are perceived as highly credible. As well, the sum of all 17 items (SHI) was used as a measure of how much credibility is placed on this diverse range of sources of health information.

The Survey of Eating Behaviours (SEB) was developed for the present study in order to identify individuals who engage in a variety of questionable eating-related behaviours. The SEB is composed of 10 true and false questions each of which was selected because it represented an eating-related behaviour of questionable benefit and potential harm.

Procedure

Subjects were asked to volunteer, in groups of ten, for a seminar preceding the study. At the seminar subjects signed a consent form and were given their identification number with their questionnaire package and the rationale for the study. They were also given forms for the three-day dietary

record to take home. Subjects were instructed how to record food and beverage consumption over three consecutive weekdays (e.g. Tuesday, Wednesday, Thursday) in order to promote clear and accurate recording.

These instructions included suggestions regarding food weighing and approximation of qualities, how to describe food preparation, and the breakdown of composite foods (foods made up of other foods). Participants were also advised to record intake at the time of consumption to promote accuracy, to not drastically change their eating habits over the course of the study, and to be honest in their recordings.

Subjects were then asked to complete the Three Factor Eating Questionnaire, the Weight Locus of Control Scale, the Food Behaviour Inventory, the perceived reliability of Sources of Health Information questionnaire, the Survey of Eating Behaviours, and a demographic information sheet including activity level. Care was taken to ensure that there were no missing responses. It took approximately 30 minutes to complete all forms. Subjects were asked to return the three-day dietary record to the experimenter's office, at which time their participation credit was recorded. Subjects were informed that their dietary assessment would be made available to them upon request after the diary was completed, and any questions about the study would be answered at that time.

Data Analysis

Body Mass Index (BMI) was computed by dividing weight in kilograms by height in metres, squared.

Data from the eating diaries were analyzed using the West Diet Analysis '91 computer dietary assessment program. The printout yielded consumption of calories, carbohydrates, fat, fibre as percentages compared to recommended daily intake. As well, percentage of total calories taken as fat was given for each subject.

Prior to analysis, all variables were examined for accuracy of data entry and for outliers. As no z-scores exceeded ± 3.00 , all scores were retained. Because the SEB was newly developed for this study, and because the SHI was being used in a different way from its original development (i.e. used as a total score), internal reliability analyses were performed on the two measures.

The main analysis was a canonical correlation which compared the predictor variables of WLOCS, and the TFEQ subscales (Cognitive Restraint, Disinhibition and Hunger Susceptibility) to the FBI, the SHI and its COMMERCIAL subscale and the SEB outcome measures. This analysis provided a control for Type 1 error. In addition, correlations were calculated among BMI and the predictor and outcome measures, including the individual

SEB items. Other correlations were calculated for BMI and the questionnaire measures with the dietary data.

Results

Table 1 contains the means and standard deviations for BMI, the TFEQ and its three subscales: Cognitive Restraint (CR), Disinhibition (DI), Hunger Susceptibility (HS), the Weight Locus of Control Scale (WLOCS); the perceived reliability of Sources of Health Information Questionnaire (SHI); the Food Beliefs Inventory (FBI); and the Survey of Eating Behaviours (SEB). BMI ranged from 16.04 to 39.24 and 38 subjects (26%) exceeded a BMI of 25 which is standard for classification of overweight individuals (Garrow, 1981). The mean BMI of 23.62 in the present study was similar to that of studies using similar populations: 21.7 (Westerterp et al., 1988), 25.2 (Van Strien et al., 1985) and 21.9 (Davis et al., 1993).

Outcome Measures

SHI Scale

Table 2 contains the 17 different sources of health information listed in the perceived reliability of Sources of Health Information questionnaire, and their rank order, from most to least reliable. Health professionals were perceived as most reliable, whereas the media and friends were given low

Table 1.

Descriptive Information For BMI and Questionnaire Measures

<u>Measure</u>	n	Mean	S.D.
BMI	147	23.62	4.19
Three Factor Eating Q.	147	20.96	8.05
Cognitive Restraint	147	8.76	5.26
Disinhibition	147	6.03	3.59
Hunger Susceptibility	147	6.32	3.19
Weight Locus of Control	147	9.78	3.38
Food Beliefs Inventory	147	36.44	5.50
Sources of Health Information	147	70.42	10.06
Commercial	147	28.48	5.43
Survey of Eating Behaviours	147	1.75	1.76

Table 2.

Means and Standard Deviations of Sources of Health Information and Corrected Item-Total Correlations for SHI Questions

RANK	SOURCE	MEAN	S.D.	Correlation
1.	Doctor	6.28	1.01	.07
2.	*Health and Medical Books	5.84	.96	.35
3.	Nurse	5.61	1.08	.29
4.	Fitness instructor	5.57	1.04	.22
5.	Pharmacist	5.19	1.24	.22
6.	*Health Food Shop Personnel	4.80	1.22	.29
7.	Natural Therapist/ Herbalist	4.63	1.18	.35
8.	*Cookbook	4.31	1.23	.35
9.	Family members	3.98	1.49	.40
10.	Chiropractor	3.73	1.24	.30
11.	Spouse/ Partner	3.52	1.43	.50
12.	*Newspaper articles	3.50	1.42	.62
13.	Best friend	3.27	1.35	.61
14.	*Magazine articles	3.20	1.49	.51
15.	*Other friends	3.05	1.23	.57
16.	*Television commercials	2.18	1.19	.46
17.	Children	1.76	1.00	.24

alpha = .79

* sources which make up the "COMMERCIAL" subscale

credibility ratings. The present results do not differ substantially from Worsley's initial study (1989).

Analysis of the internal consistency of the SHI is also presented in Table 2. The scale is moderately internally consistent ($\alpha = .79$), although a few items (e.g. "family doctor") had low item-total correlations.

Survey of Eating Behaviours (SEB)

Internal reliability analyses calculated on the SEB items are presented in Table 3, together with the means and standard deviations for each item. The scale has a low internal consistency ($\alpha = .62$). While all corrected item-total correlations were positive, some correlations were quite low (e.g. "I have converted to vegetarianism" and "I have taken mega-vitamin doses to enhance my health"). The most frequently cited behaviours were those centred upon fad dieting, fasting and over-exercising, all for the purposes of weight loss.

Because of its low internal consistency, the 10 Survey of Eating Behaviour Questions were examined individually for their correlations with the other questionnaire variables. The results, presented in Table 4, show that the SEB items were correlated only with the TFEQ and its subscales. The Cognitive Restraint Factor was significantly correlated with 6 of the 10 questions which indicates that CR is associated with a variety of questionable

Table 3.

Means and Standard Deviations of Survey of Eating Behaviour Questions and Corrected Item-Total Correlations

	Item	MEAN	S.D.	Correlation
1	"I have attempted to follow a macrobiotic diet."	.06	.24	.29
2	"I have tried a fad diet (popcorn, grapefruit, juice only, etc.)"	.17	.38	.41
3	"I have tried the practice of food-combining to enhance my health or lose weight."	.20	.40	.21
4	"I have fasted at least once in the last year without consulting a health professional."	.29	.46	.41
5	"I have converted to vegetarianism."	.12	.32	.16
6	"I have purged to lose weight."	.09	.29	.28
7	"I have taken mega-vitamin doses to enhance my health."	.18	.39	.11
8	"I have overexercised in order to lose weight quickly."	.25	.43	.41
9	"I have been told, or read about, then used a tonic, herb or root compound with the hope of changing my health status."	.10	.30	.21
10	"I have engaged in an eating behaviour which may be unhealthy."	.28	.45	.41

alpha = .62

Table 4.

**Pearson Product-Moment Correlations for the Survey of Eating Behaviour Questions
and the Other Questionnaire Variables**

VARIABLE	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	SEB
BMI	-.03	.06	-.01	-.04	-.02	-.00	-.00	-.02	.01	-.07	-.07
TFEQ	.19*	.35**	.18*	.24**	.15	.27**	.11	.39**	.21*	.23**	.49**
CR	.16	.29**	.21*	.37**	.16	.13	.09	.33**	.17*	.17*	.45**
DI	.10	.22**	.01	.09	.10	.29**	.06	.34**	.12	.24**	.34**
HS	.09	.19*	.11	-.11	-.00	.13	.05	.07	.09	.01	.12
WLOCS	-.12	-.10	-.06	-.07	-.06	-.12	.03	-.06	.02	-.04	-.13
FBI	.03	-.04	-.16	.01	-.03	-.12	-.04	-.04	.05	-.10	-.09
SHI	.00	.06	.06	.02	-.03	-.03	.05	.13	.12	.07	.13
COMM	.06	.10	.02	.17*	.12	.03	.06	.13	.13	.14	.20*

****P < 0.01**

*** P < 0.05**

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Legend for Table 4:

BMI-	Body Mass Index
TFEQ-	Three Factor Eating Questionnaire
CR-	Cognitive Restraint
DI-	Disinhibition
HS-	Hunger Susceptibility
WLOCS-	Weight Locus of Control Scale
FBI-	Food Behaviour Inventory
SHI-	perceived reliability of Sources of Health Information
COMM-	Worsley Commercial Factor
SEB-	Survey of Eating Behaviours
Q1-	Macrobiotic diet
Q2-	Fad diet
Q3-	Food combining
Q4-	Fasting
Q5-	Vegetarianism
Q6-	Purging
Q7-	Mega-Vitamins
Q8-	Over-Exercise
Q9-	Tonic/herb/root
Q10-	Unhealthy eating behaviours (open ended)

eating-related behaviours. The Disinhibition factor was positively correlated with 4 items which focused upon weight loss practices and the Hunger Susceptibility factor was significantly correlated with only one item linked to fad dieting practices. In every case the correlations were in the direction of showing more fad dieting practices in individuals high in Cognitive Restraint, Disinhibition or Hunger Susceptibility.

These findings were substantiated by Pearson Product-Moment correlations between the SEB total and the other questionnaire variables since the pattern of correlations for the individual items was very similar to the pattern for the total score. This indicates that the total score is a good summary of the information contained in the SEB questionnaire in spite of the low internal consistency.

Canonical Correlation

A canonical correlation was used to examine the relationship between the three TFEQ subscales and the WLOCS with the four outcome measures: the SHI and its COMMERCIAL subscale, the FBI and the SEB. The results are presented in Table 5. As the total TFEQ score is the sum of the three subscale scores, only the subscale measures were used in order to avoid a direct redundancy and a singular matrix. The canonical correlation showed a significant relationship between the two sets of variables $F(16, 568) = 4.07$,

Table 5.

Canonical Variates of the Predictor and Outcome Measures

Variable	Variate # 1	Variate # 2
	Loading	Loading
Cognitive Restraint	.80*	-.45*
Disinhibition	.69*	.17
Hunger Susceptibility	.40*	.89*
Weight Locus of Control	.24	-.08
FBI	.29	-.72*
SHI	-.26	.58*
COMMERCIAL	-.23	.30
SEB	.95*	-.28
	p = .000	p = .027

* correlations greater than .35 are interpreted as loading on that canonical variate.

$p < .001$. Two canonical variates were significant. The first canonical variable explained 33.43 % of the variance of the predictor variables, and 27.95 % of the variance of the outcome measures. Loadings (correlations with the canonical variate) greater than $\pm .35$ are described. The first dimension reflected individuals who were cognitively restrained, disinhibited in their eating and susceptible to feelings of hunger. These individuals were more likely to practice potentially harmful eating-related behaviours as demonstrated by SEB responses.

The second variable explained 25.67 % of the variance of the predictor variables and 25.39 % of the outcome measure variables. The loadings of this dimension revealed unexpected patterns. High scores on Hunger Susceptibility and low scores on Cognitive Restraint were associated with high scores on the SHI and low scores on the FBI. The canonical correlation also showed that the WLOCS was not associated with either of the dimensions; this was unexpected.

Pearson Product-Moment correlations were performed on BMI and the predictor and outcome measures. The results are presented in Table 6. The findings were largely consistent with those of the canonical correlation, namely that the TFEQ and its subscales were most highly correlated with the SEB and the correlations of the FBI were in the opposite direction than expected.

Table 6.

Pearson Product-Moment Correlations for BMI and All Questionnaire Variables

Variable	BMI	TFEQ	CR	DI	HS	WLOCS	FBI	SHI	COMM	SEB
BMI	--									
TFEQ	.32**	--								
CR	.21**	.69**	--							
DI	.36**	.75**	.20*	--						
HS	.02	.52**	-.07	.43**	--					
WLOCS	-.03	-.14	-.20*	-.04	.04	--				
FBI	-.07	-.19*	-.05	-.10	-.25**	.12	--			
SHI	.03	.17*	-.00	.18*	.22**	-.01	-.04	--		
COMM	-.09	.13	.03	.15	.13	-.06	.05	.84**	--	
SEB	-.03	.49**	.45**	.34**	.12	-.13	-.09	.13	.20	--

** $p < 0.00$ * $p < 0.05$ Legend:

BMI-	Body Mass Index
TFEQ-	Three Factor Eating Questionnaire
CR-	Cognitive Restraint
DI-	Disinhibition
HS-	Hunger Susceptibility
WLOCS-	Weight Locus of Control Scale
FBI-	Food Behaviour Inventory
SHI-	perceived reliability of Sources of Health Information
COMM-	SHI COMMERCIAL Factor
SEB-	Survey Of Eating Behaviours

Furthermore, apart from a relationship between external locus of control and Cognitive Restraint, the WLOCS was not correlated with any of the other measures used in the study.

Dietary Measures

Table 7 contains the means and standard deviations of the eating measures. Scores for calorie, carbohydrate, fibre and fat intake are recorded as percentages of recommended intake over a three-day period. An additional score, 'percent fat' shows subjects' percentage of total calories consumed as fat. As a group, the sample consumed 8.86% more fat than is recommended over a three day period, consumed approximately 20% less fibre than recommended, and ate slightly less than the suggested amount of calories and carbohydrates. The Canada Food Guide recommends that no more than 30% of a day's total calories be made up of fat (Health and Welfare Canada, 1993), and the group mean (32.08%) was only slightly higher.

Table 8 contains correlations of BMI and the questionnaire measures with the dietary measures. Elevated scores on Hunger Susceptibility were associated with higher consumption of calories, carbohydrates and fats. The only other significant correlation showed that an internal locus of control was associated with lower fibre intake. There were no other significant correlations; the food measures were largely unrelated to the predictor

Table 7.

Descriptive Data for Dietary Variables

VARIABLE	n	Mean Percent	S.D.
CALORIES	91	97.05	45.81
CARBOHYDRATES	91	92.88	45.38
FIBRE	91	80.68	44.37
FAT	91	108.86	73.64
% FAT	91	32.08	7.32

Table 8.

**Pearson Product-Moment Correlations for of BMI and Questionnaire Data
and the Diary Data**

VARIABLE	CAL	CAR	FIBRE	FAT	%
BMI	.00	-.03	-.04	.13	.17
TFEQ	.08	.12	.15	.03	-.05
CR	-.14	-.00	-.02	-.20	-.19
DI	.13	.09	.19	.14	.05
HS	.27**	.24*	.16	.24*	-.12
WLOCS	-.17	-.17	-.27**	-.12	.05
FBI	-.07	-.14	-.14	.00	.15
SHI	.00	-.03	.05	.03	.03
COMM	-.03	-.04	.10	-.01	.02
SEB	-.04	-.03	.12	.01	.07

**P < 0.01

* P < 0.05

(LEGEND NEXT PAGE)

Legend for Table 8:

BMI-	Body Mass Index
TFEQ-	Three Factor Eating Questionnaire
CR-	Cognitive Restraint
DI-	Disinhibition
HS-	Hunger Susceptibility
WLOCS-	Weight Locus of Control Scale
FBI-	Food Behaviour Inventory
SHI-	Perceived Reliability of Sources of Health Information
COMM-	Worsley Commercial Factor
SEB-	Survey of Eating Behaviours

variables and were not significantly related to the outcome measures.

Diet

The sample was split according to self-report into groups of dieters and non-dieters. Self-reports indicated that 35 subjects (24%) were on a diet at the time of the study, while 112 (76%) were not. Dieters were significantly more likely to have higher scores on dietary restraint as measured by the TFEQ $t(145)=6.12, p < .01$, to be cognitively restrained $t(145)=6.53, p < .01$, and to have a higher BMI $t(145)=3.10, p < .01$. The two groups did not differ significantly on the other questionnaire measures, or on the dietary measures.

Discussion

Much diet and nutrition information that is available to consumers has not been validated by health experts. Individuals who are aware of and interested in such information are, therefore, at risk for utilizing health and diet practices which may not help, and may even harm them. Assessing predictors of susceptibility to the diet and nutrition media may be important in determining individuals' risk. However, little research has been done in the area. The aim of this study was (1) to explore whether the constructs of dietary restraint and locus of control would predict several measures which may reflect different aspects of susceptibility to the diet and nutrition media,

and (2) to determine whether this susceptibility would be reflected in actual eating behaviours.

The predictor measures used in the present study were established and validated assessment devices. These measures were the TFEQ and its Cognitive Restraint, Disinhibition and Hunger Susceptibility subscales (to determine degree of dietary restraint), and the WLOCS (to assess locus of control with regard to weight).

As a review of the literature did not yield devices specifically assessing susceptibility to the diet and nutrition media, it was necessary to utilize alternative measures. Four devices were selected on the rationale that each one operationalized a set of cognitions or behaviours reflective of susceptibility to the diet and nutrition media. These measures include Worsley's (1989) perceived reliability of Sources of Health Information questionnaire and its COMMERCIAL subscale, Wisocki and King's (1992) Food Behaviour Inventory and the newly developed Survey of Eating Behaviours. Each measure was of interest in and of itself as reflecting part of the larger susceptibility construct.

Canonical Correlation

A canonical correlation was performed to examine the relationship between the predictor and outcome measures. Two significant relationships

were identified. The findings demonstrate that, as hypothesized, Cognitive Restraint, Disinhibition and Hunger Susceptibility were related to questionable eating-related behaviours as measured by the SEB. These findings support studies (e.g. Stunkard & Messick, 1985) which show that dietary restraint is associated with responsiveness to strategies for dieting, some of which may be of dubious benefit and potential harm. Cognitive Restraint had the strongest relationship with the SEB: deliberate restriction of intake was strongly related to the tendency to engage in questionable eating-related behaviours. Similar findings have been obtained in other studies (e.g. Laessle et al., 1988) which demonstrate a linkage between conscious caloric restriction, or Cognitive Restraint, and exaggerated interest in information related to food and dietary matters. Such hyperawareness may lead individuals to practice suggestions purveyed by the diet and nutrition media which are often of questionable reliability (Dwyer, 1993).

The relationship of the TFEQ subscales to the SEB is substantiated by Pearson Product-Moment correlations performed between the individual SEB items and the other variables in the study. The results show that CR has the strongest association with the SEB as shown by the number of significant correlations. The DI and HS possess, respectively, the next highest relationships to the SEB items. While CR is associated with a variety of

questionable dieting and health-enhancing practices, the DI subscale is most strongly related to behaviours associated with weight loss, and HS is linked only to fad dieting practices.

The second canonical variate revealed a complex association between the predictor variables Cognitive Restraint and Hunger Susceptibility, and the FBI and SHI criterion variables. The loading pattern of the predictor variables shows that individuals with low Cognitive Restraint and high Hunger Susceptibility had high scores on the SHI and low scores on the FBI. These individuals perceive a variety of sources of health information as credible despite not strongly believing that foods affect behaviours. Hypersensitivity to feelings which elicit eating (HS) when combined with a lack of restriction of intake (CR) may produce a halo of credibility of a variety of sources of health information (SHI), even in individuals who do not consciously believe that foods can affect behaviours (FBI). Therefore, despite reporting that foods cannot affect behaviours, these individuals may, nevertheless, be vulnerable to questionable sources of health information.

The finding that the WLOCS was not associated with either of the significant dimensions of the canonical correlations was unexpected. Because locus of control has been associated with sensitivity to food cues (Rodin & Slochower, 1976) it was expected that the WLOCS would be as strongly

associated with the susceptibility measures as the dietary restraint subscales. The present study, however, did not confirm these relationships. The failure of the WLOCS to predict either susceptibility or major food intake measures (i.e. calories, carbohydrates) is striking. Although locus of control has been shown to be predictive of eating behaviours (e.g. Grace, 1985; Rodin & Slochower, 1983), there is reason to question the validity of this particular measure. The weakness of the WLOCS may lie in its 4-item length, its low test-retest reliability (Saltzer, 1982) and the paucity of studies demonstrating its relationship with disordered eating patterns.

TFEQ and Dietary Intake

The HS subscale of the TFEQ had the strongest relationship with calorie, carbohydrate and fat consumption. Higher sensitivity to physiological feelings of hunger was associated with greater consumption of these food components. These results are similar to previous reports (e.g. Lowe & Maycock; 1988) which show that high HS individuals are likely to consume more than low HS individuals.

The lack of significant relationships between the TFEQ, its CR and DI subscales, and the dietary variables was unexpected. Other studies (e.g. Laessel et al., 1989; Wardle, 1987; Van Strien et al., 1986) demonstrate a negative relationship between overall restraint scores and food/ caloric intake,

showing that greater dietary restraint results in fewer calories consumed. Such results were not found in the present study.

The WLOCS and Dietary Intake

The WLOCS was negatively correlated with fibre consumption, indicating that internal locus of control was associated with decreased fibre intake. This finding was unexpected and contrary to the literature which shows that internal locus of control is predictive of good health and following recommended health behaviours (Saltzer, 1981). This was the only significant correlation with the WLOCS. Because no overall correction for Type 1 error was used, this finding should be viewed as preliminary unless it is replicated.

Food Diaries

Results from the food diaries reveal relationships with only a few of the predictor variables. The failure to find stronger relationships may reflect limitations inherent to food diaries. For example, the accuracy of food recordings can always be questioned as it is not certain that all foods eaten by participants were recorded. As well, despite explicit guidelines for recording intake, instructions were frequently neglected (for example, food amounts and types were sometimes omitted). Respondents might also have been motivated to record inaccurate food types and quantities in order to seem healthier or appear more favourable in the eyes of the researcher (Morgan, Johnson, Pizek,

Reise & Stamply, 1987).

There were also problems due to the lack of choice of foods which could be coded into the dietary assessment computer program. Matches for foods which had been recorded could often not be found in the computer menu, which necessitated substitutions (for example substituting 'apple muffin' for 'lemon muffin'). As well, the computer program does not differentiate between foods that had been cooked for variable lengths of time, a factor which can influence the nutritional as well as caloric content of foods.

Future Research

Because this is one of the first studies to examine susceptibility to the diet and nutrition media, a number of issues emerged which point to directions for future research in the area. The TFEQ and WLOCS were only partially successful in predicting susceptibility; other psychological constructs might be useful in anticipating vulnerability to the diet and nutrition media.

The outcome measures used in the present study were exploratory devices selected on the basis of their possible relationship to the notion of susceptibility to the diet and nutrition media. Future studies might concentrate on identifying other measures which operationalize components of susceptibility, and evaluating how they relate to dietary restraint, locus of

control and other predictor measures not considered in the present study.

The outcome measure most strongly associated with the predictor measures in the present study was the SEB. Analysis of the SEB's items, however, revealed a low internal consistency. Future research might be directed towards the factor analysis of other questionable food-related behaviours to develop a stronger SEB measure.

With regard to the dietary data, it would be worthwhile for researchers to develop a more flexible and more accurate, computerized diet assessment program. The selection of foods in the program's data base would require substantial enlargement. As well, the inclusion of preparation codes, for example "fried," "boiled" or "skinned" and durations of cooking time, rather than simple menu items, would enhance the accuracy of data entry.

Summary

Individuals high in Cognitive Restraint were more likely to engage in a range of questionable food-related behaviours. However, neither the TFEQ nor the WLOCS were directly associated with beliefs about the effects of food on behaviour (FBI), or beliefs in the credibility of either commercial or other sources of health information. Thus the present study failed to identify a clear profile of individuals who might be particularly susceptible to the diet and

nutrition media. Only the Hunger Susceptibility scale of the TFEQ was related to the major indices of food consumption (calories, carbohydrates and fats).

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THREE FACTOR-EATING QUESTIONNAIRE

Please answer the following T (true) or F (false).

- | | TRUE | FALSE |
|---|------|-------|
| 1. When I smell a sizzling steak or see a juicy piece of meat, I find it very difficult to keep from eating, even if I have just finished a meal. | T | F |
| 2. I usually eat too much at social occasions, like parties and picnics. | T | F |
| 3. I am usually so hungry that I eat more than three times a day. | T | F |
| 4. When I have eaten my quota of calories, I am usually good about not eating any more. | T | F |
| 5. Dieting is so hard for me because I just get too hungry. | T | F |
| 6. I deliberately take small helpings as a means of controlling my weight. | T | F |
| 7. Sometimes things just taste so good that I keep on eating even when I am no longer hungry. | T | F |
| 8. Since I am often hungry, I sometimes wish that while I am eating, an expert would tell me that I have had enough or that I can have something more to eat. | T | F |
| 9. When I feel anxious, I find myself eating. | T | F |
| 10. Life is too short to worry about dieting. | T | F |
| 11. Since my weight goes up and down, I have gone on reducing diets more than once. | T | F |
| 12. I often feel so hungry that I just have to eat something. | T | F |
| 13. When I am with someone who is overeating, I usually overeat too. | T | F |
| 14. I have a pretty good idea of the number of calories in common food. | T | F |
| 15. Sometimes when I start eating, I just can't seem to stop. | T | F |

- | | | | |
|-----|--|---|---|
| 16. | It is not difficult for me to leave something on my plate. | T | F |
| 17. | At certain times of the day, I get hungry because I have gotten used to eating then. | T | F |
| 18. | While on a diet, if I eat food that is not allowed, I consciously eat less for a period of time to make up for it. | T | F |
| 19. | Being with someone who is eating often makes me hungry enough to eat also. | T | F |
| 20. | When I feel blue, I often overeat. | T | F |
| 21. | I enjoy eating too much to spoil it by counting calories or watching my weight. | T | F |
| 22. | When I see a real delicacy, I often get so hungry that I have to eat right away. | T | F |
| 23. | I often stop eating when I am not really full as a means of limiting the amount that I eat. | T | F |
| 24. | I get so hungry that my stomach often seems like a bottomless pit. | T | F |
| 25. | My weight has hardly changed at all in the last ten years. | T | F |
| 26. | I am always hungry so it is hard for me to stop eating before I finish the food on my plate. | T | F |
| 27. | When I feel lonely, I console myself by eating. | T | F |
| 28. | I consciously hold back at meals in order not to gain weight. | T | F |
| 29. | I sometimes get very hungry late in the evening or at night. | T | F |
| 30. | I eat anything I want, any time I want. | T | F |
| 31. | Without even thinking about it, I take a long time to eat. | T | F |
| 32. | I count calories as a conscious means of controlling my weight. | T | F |
| 33. | I do not eat some foods because they make me fat. | T | F |
| 34. | I am always hungry enough to eat any time. | T | F |

35. I pay a great deal of attention to changes in my figure. T F
36. While on a diet, if I eat a food that is not allowed, I often then splurge and eat other high calorie foods. T F

PLEASE ANSWER THE FOLLOWING QUESTIONS BY CIRCLING THE NUMBER ABOVE THE RESPONSE THAT IS APPROPRIATE TO YOU.

37. How often are you dieting in a conscious effort to control your weight?
- | | | | |
|--------|-----------|---------|--------|
| 1 | 2 | 3 | 4 |
| rarely | sometimes | usually | always |
38. Would a weight fluctuation of 5 lbs affect the way you live your life?
- | | | | |
|------------|----------|------------|-----------|
| 1 | 2 | 3 | 4 |
| not at all | slightly | moderately | very much |
39. How often do you feel hungry?
- | | | | |
|-------------------|-------------------------|---------------------|---------------|
| 1 | 2 | 3 | 4 |
| only at mealtimes | sometimes between meals | often between meals | almost always |
40. Do your feelings of guilt about overeating help you to control your food intake?
- | | | | |
|-------|--------|-------|--------|
| 1 | 2 | 3 | 4 |
| never | rarely | often | always |
41. How difficult would it be for you to stop eating halfway through dinner and not eat for the next four hours?
- | | | | |
|------|--------------------|----------------------|----------------|
| 1 | 2 | 3 | 4 |
| easy | slightly difficult | moderately difficult | very difficult |
42. How conscious are you of what you are eating?
- | | | | |
|------------|----------|------------|-----------|
| 1 | 2 | 3 | 4 |
| not at all | slightly | moderately | extremely |
43. How frequently do you avoid 'stocking' up on tempting foods?
- | | | | |
|--------------|--------|---------|---------------|
| 1 | 2 | 3 | 4 |
| almost never | seldom | usually | almost always |

44. How likely are you to shop for low calorie foods?

1	2	3	4
unlikely	slightly unlikely	moderately likely	very likely

45. Do you eat sensibly in front of others and splurge alone?

1	2	3	4
never	rarely	often	always

46. How likely are you to consciously eat slowly in order to cut down on how much you eat?

1	2	3	4
unlikely	slightly likely	moderately likely	very likely

47. How frequently do you skip dessert because you are no longer hungry?

1	2	3	4
almost never	seldom	at least once a week	almost every day

48. How likely are you to consciously eat less than you want?

1	2	3	4
unlikely	slightly likely	moderately likely	very likely

49. Do you go on binges though you are not hungry?

1	2	3	4
never	rarely	sometimes	at least once a week

50. On a scale of 0 to 5, where 0 means no restraint in eating (eating whenever you want it) and 5 means total restraint (constantly limiting food intake and never 'giving in'), what number would you give yourself?

0

eat whatever you want, whenever you want it

1

usually eat whatever you want, whenever you want it

2

often eat whatever you want, whenever you want it

3

often limit food intake, but often 'give in'

4

usually limit food intake, rarely 'give in'

5

constantly limiting food intake, never 'give in'

51. To what extent does this statement describe your eating behaviour?

'I start dieting in the morning, but because of any number of things that happen during the day, by evening I have given up and eat what I want, promising myself to start dieting again tomorrow.'

1

not like
me

2

little
like me

3

pretty good
description
of me

4

describes
me
perfectly

Weight Locus Of Control Scale (WLOCS: Saltzer, 1982)

1. Whether I gain, lose or maintain my weight is entirely up to me.

1	2	3	4	5	6
strongly disagree					strongly agree

2. Being the right weight is largely a matter of good fortune.

1	2	3	4	5	6
strongly disagree					strongly agree

3. No matter what I intend to do, if I gain or lose weight or stay the same in the near future, it is just going to happen.

1	2	3	4	5	6
strongly disagree					strongly agree

4. If I eat properly and get enough exercise, and rest, I can control my weight in the way I desire.

1	2	3	4	5	6
strongly disagree					strongly agree

Food Attitude Inventory

Part I General Food Behavior Beliefs

Below is a list of questions about your beliefs in various food ingredients and how they may affect behaviors and feelings. Please circle the number which most closely corresponds to your belief about the item. Be sure to answer each item.

1. Hyperactivity can be caused or aggravated by sugar.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

2. Hyperactivity can be caused or aggravated by food dyes or food colorings.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

3. Depression can be caused or aggravated by a food allergy or food sensitivity.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

4. Irritability can be caused or aggravated by a food allergy or food sensitivity.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

5. Fatigue can be caused or aggravated by a food allergy or food sensitivity.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

6. Anxiety/tension can be caused or aggravated by a food allergy or food sensitivity.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

7. Difficulty in thinking clearly can be caused or aggravated by a food allergy or food sensitivity.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

8. Sleepiness or drowsiness can be caused by sugar consumption.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

9. Sleepiness or drowsiness can be caused by protein consumption (e.g., meat).

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

10. Sleepiness or drowsiness can be caused by consuming milk and cereal.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

11. Wakefulness can be caused by protein consumption.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

12. Sexual drive can be increased by protein consumption.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

13. Menstrual symptoms can be affected by the foods women eat.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

14. Athletic performance can be improved by increased carbohydrate intake.

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

Perceived Reliability of Sources of Health Information
Questionnaire

1. Health food shop personnel

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

2. Pharmacist

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

3. Fitness instructor

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

4. Best friend

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

5. Newspaper articles

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

6. Spouse/ partner

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

7. Chiropractor

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

8. Friends

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

9. Family doctor

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

10. TV commercials

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

11. Cook books

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

12. Children

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

13. Magazine articles

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

14. Health and medical books

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

15. Best friend

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

16. Family members

1	2	3	4	5	6	7
very unreliable			not sure			very reliable

17. Nurse

1	2	3	4	5	6	7
very unreliable			not sure			very reliable