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Psychological Factors Related to Glucose  
Control in Diabetic Young Women

Louise Balfour

A Thesis  
in  
The Department  
of  
Psychology

Presented in Partial Fulfillment of the Requirements  
for the Degree of Masters of Arts at  
Concordia University  
Montréal, Québec, Canada

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## ABSTRACT

PSYCHOLOGICAL FACTORS RELATED TO GLUCOSE  
CONTROL IN DIABETIC YOUNG WOMEN

Louise Balfour, M.A.  
Concordia University, 1990

The purpose of the current study is to examine the relationship of stress, self-esteem, dietary disinhibition, and blood glucose control in young diabetic women. Sixty-five diabetic females ranging in age from 12-26 years completed self-esteem, eating behaviors, and perceived stress scales during regular clinic visits. Blood glucose control was assessed by HbA1c measurements taken at the same time.

A series of multiple regressions indicate that as predicted diabetic females who report high dietary disinhibition have poor glucose control; low self-esteem and high levels of perceived stress jointly predict dietary disinhibition. Within the age range studied, age is related to duration of diabetes, perceived stress, and self-esteem and also shares in the prediction of disinhibition. Young women are more apt than early adolescent girls to perceive their lives as stressful, to report lower self-esteem, and to have had diabetes longer.

Low self-esteem is not associated with poor glucose control. However, diabetic women who perceive their lives as stressful experience poor blood glucose control. In fact, disinhibition mediates the relationship between stress and glucose control. Diabetic women who perceive their lives as stressful are more likely to disinhibit from their diet and to exhibit poor glucose control.

These findings have implications for understanding and preventing the development of poor glucose control in at risk diabetic young women.

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PSYCHOLOGICAL FACTORS RELATED TO GLUCOSE  
CONTROL IN DIABETIC YOUNG WOMEN

Insulin dependent diabetes mellitus is a major health problem which afflicts 10-15 children per 100 000 each year in North America (Barlow, Berndt, Burns, & Hatcher 1986). Statistics from the National Commission on Diabetes indicate that diabetics are five times more likely to develop gangrene, 17-25 times more susceptible to kidney disease, and twice as prone to heart disease and stroke than nondiabetic individuals (National Commission on Diabetes Report, 1975, cited in Gross, Delcher, Snitzer, Bianchi, & Epstein, 1983). Fortunately, excellent diabetic control can reduce the incidence of these chronic degenerative complications (Cahill, Etwiler, & Freinkel, 1976). However, achieving and maintaining near normal blood glucose levels requires strict adherence to a complex medical regimen and is a difficult task for adolescent diabetics.

The numerous difficulties diabetic youngsters experience in trying to maintain good metabolic control has stimulated research examining potential links between psychological variables and diabetic control (Hamburg & Inoff, 1982; Skyler, 1981). Some researchers have examined whether psychological characteristics distinguish diabetic youngsters from their nondiabetic peers. The hypothesis that diabetic adolescents psychologically differ from nondiabetic peers evolved in part from the assumption that the burden of diabetic compliance and fear of physical deterioration causes diabetic youngsters to experience lower self-esteem and more psychological stress than their nondiabetic peers. Results from many studies fail to support such hypotheses and indicate that as a group, diabetics generally have average or above average self-esteem and

experience no more stress than their peers (Anderson, Miller, Auslander, & Santiago, 1981; Brown, 1985; Gross et al., 1983; Ryan & Morrow, 1986; Ryan, Vega, & Drash, 1985; Sullivan, 1978; Tavormina, Kastner, Slater & Watt, 1976).

Perhaps a better question is whether such psychological variables can distinguish diabetics with poor versus good metabolic control. Results from studies examining the relationship between stress, self-esteem, and metabolic control are mixed. Some studies find that high stress and low self-esteem are associated with poor metabolic control (Anderson et al., 1981; Barlow, Edidin, Budlong-Springer, Brendt, Phillips, & Dubow 1983; Chase & Jackson, 1981; Cox, Taylor, Nowacek, Holley-Wilcox, & Pohl, 1984; Hanson, Henggeler, & Burghen, 1987; Hanson & Pichert 1986; Jacobson, Rand, & Hauser, 1985; Mazze, Lucido, & Shamon, 1984) and others do not (Bradley, 1979; Delamater, Kurtz, Bubb, White, Santiago, 1987; Grant, Kyle, Teichman, & Mendels, 1974; Gross et al., 1983; Rovet, Ehrlich, & Hoppe, 1987; Simonds, Goldstein, Walker, & Rawlings, 1981). The present study attempts to clarify the relationship among self-esteem, stress, and metabolic control in diabetic young women by focussing on the role of disinhibition or dietary lapses related to high restraint in this multivariate network.

Though disinhibition has not been studied in the diabetic population, several studies have reported a high incidence of eating abnormalities in young diabetic women (Hudson, Wentworth, Hudson, & Pope, 1985; Lloyd, Steel, & Young, 1987; Rodin, Daneman, Johnson, Kenshole, & Garfinkel, 1985; Steel, Young, Lloyd, & Clarke, 1987; Wing, Nowalk, Marcus, Koeske, & Finegold, 1986). Adherence to a very rigid

and restricted diet is one of the most difficult components of diabetic compliance (Ary, Toobert, Wilson, & Glasglow, 1986; Glanz, 1980; House, Pendleton, & Parker, 1986). Such adherence seems particularly difficult for adolescents who want to "fit in" and often feel pressured to adopt the eating patterns of their peers. The emphasis on adherence may promote a pattern of restraint followed by dietary disinhibition common in eating disorders and in dieting young women.

One goal of this study is to determine whether dietary disinhibition is linked with poor blood glucose control and to clarify how perceived stress and self-esteem influence dietary adherence. As well, self-esteem and perceived stress are examined with respect to blood glucose control. Psychological stress is of particular interest because it is posited to influence blood glucose control directly (i.e., physiologically) and indirectly by interfering with dietary compliance behaviors.

#### Background

In order to fully understand the complexity, importance, and difficulties involved in adhering to a diabetic regimen, a brief introduction to the nature and physiology of diabetes is provided. As well, the theory of cognitive restraint and disinhibition, research examining stress and self-esteem as predictors of disinhibition, and studies investigating eating behaviour in diabetics are reviewed. Finally, research examining stress and self-esteem in diabetics is explored.

Nature of Diabetes: There are two distinct forms of diabetes, type 1 and type 2. In type 1 (Insulin Dependent Diabetes Mellitus - IDDM),

the pancreas has completely ceased producing insulin and the patient is dependent on exogenous insulin injection for carbohydrate metabolism. Children most often develop this type of diabetes, although it sometimes develops in adulthood. In type 2 diabetes, the pancreas may produce some but insufficient amounts of insulin. This condition is often exacerbated by obesity and may be ameliorated by dietary management and weight loss. With proper medical regimen adherence, some type 2 diabetics may never require exogenous insulin administration. As the present study consists solely of patients with type 1 diabetes, this review will focus on issues concerning IDDM.

To date, several factors have been implicated as possible causes of IDDM: (1) heredity; (2) viral infections; and (3) psychological stress (Turk & Speers, 1983). Regardless of etiology, IDDM patients are faced with a life-long chronic disorder chiefly characterized by inefficient carbohydrate metabolism and oscillations between states of hypoglycemia and hyperglycemia (low and high blood sugar levels). IDDM is a condition which results from a deficiency of insulin function. Insulin is a protein hormone normally produced by the Beta cells of the pancreas, which enhances body cell blood glucose uptake. Without insulin, glucose can neither be used by the body for energy nor adequately stored. Under these conditions, glucose builds up in the bloodstream. At sufficiently elevated levels, glucose spills over into the urine and is excreted. When glucose is not available as fuel, fat is used as a substitute. However, complete combustion of fat requires the presence of substances produced during the combustion of glucose. Without glucose metabolism, fat combustion is incomplete, resulting in

the production and accumulation of toxic ketone bodies in the blood. If ketone bodies collect in sufficient amounts they cause ketoacidosis, a severe biochemical imbalance that produces acute and severe illness and eventually may result in coma and death. The possible long term complications resulting from chronic poorly controlled diabetes (i.e. moderately high blood glucose levels) include heart disease, degeneration of kidneys, blindness, sexual dysfunctions, and circulatory problems necessitating amputation (Fisher, Delamater, Bertelson, & Kirkley, 1982).

At the other end of the continuum, hypoglycemic reactions (low blood glucose) can ensue from excess insulin dosage, unplanned strenuous exercise, or inappropriate diet. Hypoglycemic reactions require rapid intervention and ingestion of carbohydrates (sugar, fruit juice). Left untreated, severe hypoglycemia can result in unconsciousness, seizures, and death. Recent evidence suggests that it is possible to avoid most of these acute and long term diabetic complications by maintaining good blood glucose levels (Cahill et al., 1976; Siperstein, Foster, Knowles, Levine, Madison, & Roth, 1975). However, in order to achieve adequate levels of metabolic control, patients must responsibly and faithfully adhere to a very strict and complex medical regimen consisting of home monitoring of blood sugar and urine levels, daily insulin injections, skin care, consistent physical activity patterns, frequent record keeping, and careful dietary monitoring and restriction (Fisher et al., 1982; Turk & Speers, 1983). Dietary adherence is consistently reported in the literature as one of the most difficult aspects of compliance for diabetics (Ary et al., 1986; Glanz, 1980; House et al., 1986). They

must constantly monitor and time food intake, make dietary adjustments related to exercise, and must restrict the intake of good tasting highly desired foods, often in the presence of peers.

Although diabetic dietary compliance is difficult to achieve for all diabetics, dieting behaviour may be more salient and reinforcing for diabetic young women. As western society increasingly promotes thinness in women as a symbol of beauty and success (Garner & Garfinkle, 1980), food and weight control have become topics of great concern to many young women. In their attempts at achieving the "ideal" thin female figure, many young women adhere to a series of strict and unhealthy diets. Huenemann, Shapiro, Hampton, and Mitchell (1966) reported that between 63-70% of high school girls expressed dissatisfaction with their bodies and wanted to slim down. Jakobovits, Halstead, Kelley, Roe, and Young (1977) found that 75% of college women were consciously trying to limit their food intake. In an attempt to understand dieting behaviour in young women, Herman and Mack (1975) developed a theory of dietary cognitive restraint and constructed a scale to measure it. The theory of "restraint" has provided an operationalized measure of dieting and has facilitated and stimulated much research on dieting.

Theory of Restraint and Disinhibition: One of the most interesting ideas to emerge from restraint theory is that excessive dieting is related to disinhibition or breaking of one's diet. Herman and Polivy (1975) note that eating patterns are influenced by the precarious balance between physiological and emotional needs for food and cognitive effort to resist these desires. This cognitive effort at fighting the urge to eat is termed "restraint". Basically high restrainers are



chronic dieters who constantly struggle against their desire to eat and are obsessed with thoughts of food. Moreover, excessive cognitive restraint often fails. Herman and Polivy (1975) describe such failure as the "disinhibition hypothesis". According to this hypothesis, the rigid self control of restrained eaters places them in a state of physiological and psychological deprivation which cannot be maintained indefinitely; thus, although restrained eaters are generally successful in controlling their desires to eat, certain situations can release dietary inhibitions. Herman and Polivy (1975) conducted a series of studies to test the disinhibition hypothesis. These studies indicate that when disinhibition occurs, previously suppressed eating is unleashed and normal weight restrainers can consume large quantities of food (For a review see Ruderman, 1986). Studies also show that effective disinhibitors can be cognitively, affectively, or pharmacologically mediated. After eating a high caloric taboo food, many restrainers engage in disinhibiting thoughts such as "I've ruined it, the day is lost. I might as well just continue to eat. Tomorrow I'll start my diet for real". Affective and pharmacological conditions which have been empirically shown to disinhibit restrained eating include anxiety, depression, and alcohol (Herman & Polivy, 1975; Hibscher & Herman, 1977; Polivy & Herman, 1976; Ruderman, 1985).

Psychometric Measurement of Restraint and Disinhibition: Herman & Polivy (1975) developed a 10 item questionnaire to measure restraint and utilized experimental manipulations to elicit dietary disinhibition. More recently Stunkard and Messick (1985) developed a Three Factor Eating Questionnaire which measures restraint, but also disinhibition

and perceived hunger based on subject's self-reports.

The distinct restraint and disinhibition scales in Stunkard's inventory seem particularly relevant in examining eating behaviour in IDDM young women. In some ways, restrained eating is similar to the strict dieting behaviour that diabetic patients are required to follow as part of their comprehensive medical regimen. Unfortunately, high restraint may not be associated with improved dietary compliance in diabetics. Restraint theory suggests that excessive dieting is associated with high disinhibition. Such disinhibition may be related to poor glucose control.

Restraint, Disinhibition, and Glucose Control in Diabetic Young Women: Diabetic diets severely restrict the consumption of instantly gratifying simple carbohydrates. However, like most individuals, many diabetics crave for the forbidden sweets and practically all diabetics do sometimes "cheat" on their diets (Hillard & Hillard, 1984). This perpetual cycle of intense craving, consumption of taboo foods, and the ensuing guilt is quite similar to that experienced by rigid cognitive restrainers who disinhibit (Polivy & Herman, 1987).

Besides the inevitable preoccupation with the issue of food consumption required by the diabetic regime, diabetic young women must deal with concerns about weight control which are common in our society. Achieving weight loss for diabetics is often extremely difficult as caloric restriction without appropriate reduction of insulin dosage can lead to hypoglycemia. Then the elevated calories in the food required to treat the hypoglycemic reaction (sugar, candy, fruits) may negate previous weight loss and demoralize the patient.

In order to compensate for sweets ingested during hypoglycemic periods and for lapses in dietary control often precipitated by prolonged restraint, diabetics can engage in extreme behaviors which may affect blood glucose levels. First, diabetics may utilize anorexic-techniques such as increased restraint, purging, and laxative abuse. Numerous studies have shown that diabetic young women engage in such behaviors (Rodin, Johnson, Garfinkel, Daneman, & Kenshole, 1986-87; Rosemark, Berne, Holmgren, Lago, Renholm, & Sohlberg, 1986; Steel et al., 1987). Such behaviors have been repeatedly associated with poor blood glucose control (Rodin et al., 1985; Rodin et al., 1986-87; Wing et al., 1986).

Diabetics have additional techniques for manipulating weight. They can refuse to eat after insulin administration or intentionally reduce their insulin dosage in order to prevent the absorption and metabolism of carbohydrates consumed (Hillard & Hillard, 1984). Diabetics may associate insulin administration with weight gain and deliberately reduce their insulin dosage in order to remain thin even after ingesting high calorie foods (Szmukler, 1984; Szmukler & Russell, 1983). Rodin, Craven, Littlefield, & Daneman (1989) found that more than 10% of IDDM female patients admit to cutting back on insulin to produce desired weight loss. LaGreca, Schawtz, and Satin (1987) examined the relationship between such insulin manipulations and blood glucose levels. Fifty percent of diabetic young women in fair control, and seventy percent in poor control reported coping with overeating by reducing their insulin intake. Notably, none of the diabetics in good metabolic control reported manipulating their insulin intake in such a

manner.

In summary, young diabetic women are pressured to restrain in order to meet both illness-related dietary regimes and standards for slimness. There is evidence that 10-20% of these young women engage in anorexic-like behaviors and insulin manipulation strategies to counter the effects of dietary lapses (Hudson et al., 1985; Rosemark et al., 1986). These behaviors have been associated with poor blood glucose control. Many more diabetic women may engage in disinhibition, which may also affect blood glucose levels. Given the importance in maintaining adequate glucose levels in IDDM patients, it seems essential to study disinhibition directly and to investigate the relationship between disinhibition and glucose control.

It is possible that other important factors are related to glucose control and disinhibition. Two variables which have been examined with respect to disinhibition in nondiabetic young women are stress and self-esteem. Studies have attempted to show that high stress and low self-esteem are associated with disinhibition. The relationship of glucose control to both stress and self-esteem has also been studied in diabetic populations. Both stress and self-esteem variables are reviewed and discussed with respect to research on disinhibition as well as with respect to diabetes research.

Stress: As far back as 1684, expert physicians on diabetes claimed that "prolonged sorrow" was an important etiological factor in the development of diabetes (Willis, 1684). Following this, most early reports suggesting possible links between psychological stress and diabetes have been merely anecdotal observations by physicians. For

example, Folin, Denis, and Smillie (1914) observed and noted transient glycosuria during exam stress in medical and college students. Today, stress is posited to influence diabetic control by two major pathways; (1) directly influencing hormonal functioning, and (2) indirectly interfering with diabetic adherence behaviour. In terms of the former, substantial evidence supports the hypothesis that activating stress hormones can have negative direct physiological effects on diabetic control. Experimentally induced acute psychological stress has been shown to (1) increase cortisol levels which elevate blood glucose, (2) increase levels of catecholamines (epinephrine or norepinephrine) which oppose insulin action thus increasing blood glucose, and (3) stimulate glucagon secretion which also increases blood glucose levels (Evans, 1985; Tarnow & Silverman, 1981-82).

The indirect effects of stress acting through dietary disinhibition have been more difficult to assess. This review examines several lines of literature which seem relevant. First, the relationship of stress to overeating in obese individuals is reviewed. These studies provide support for the idea that stress may indeed trigger disinhibition. Secondly, an attempt is made to integrate research on stress, disinhibition, and glucose control in adult diabetics. A major challenge in evaluating this literature is to adequately define and measure psychological stress. As well, the vast majority of adult studies examining the effects of stress on metabolic control, have not included measures of disinhibition or dietary compliance so that the indirect effects of stress could be addressed. Various measures of stress are reviewed in an attempt to establish whether specific stress

measures can be related to long term glucose control. Finally, the relationship of stress, adherence, and glucose control in diabetic adolescents is reviewed.

Stress, Obesity, Restraint and Disinhibition: Research examining the relationship between emotional stress and eating first began as an attempt to understand eating behavior in obese individuals. It was hypothesized that overweight individuals have learned to eat as an inappropriate coping response to negative emotional states (Bruch, 1973). White (1973; cited in Baucom & Aiken, 1981) tested the hypothesis that overweight but not normal weight individuals would consume more food when stressed than calm. He exposed obese and normal weight subjects to emotionally arousing films (humorous, distressing, or sexual) and to a neutral travel log. Only the overweight individuals increased eating in response to the arousing films. Other studies have also shown that only overweight individuals eat in response to experimentally induced negative emotional states (McKenna, 1972; Slochower & Kaplan, 1980). More naturalistic studies using techniques such as self-monitoring of eating behavior, have also found that overweight individuals are more likely to eat in response to negative emotional states than normal weight individuals (Leon & Chamberlain, 1973; Lowe & Fisher, 1983; Lingwiler, Crowther, & Stephens, 1987). For example, Slochower, Kaplan, and Mann (1981) examined eating behavior in response to the real life stressor of college exam period. When ostensibly brought into a laboratory for a taste test, obese female subjects ate significantly more during exam period than they subsequently did three weeks after final exams. Normal weight

individuals' eating behavior did not vary as a function of exam stress. These studies offer support for the hypothesis that obese individuals are more likely to eat in response to negative emotional states than normal weight individuals. However, they do not explain why emotional stress differentially affects eating behavior in overweight and normal weight individuals. One approach to solving this problem is to examine characteristics that differentiate obese from normal weight individuals. Given that weight concern and dieting behavior are probably more salient for overweight than normal weight individuals, dieting behavior may be an important variable to consider. That is, perhaps there is something about dieting behavior that promotes eating as a coping response to negative emotional states such as stress.

A study by Baucom and Aiken (1981) helps clarify the relationship between dieting, obesity, and eating in response to emotional stress. Dysphoric mood was successfully experimentally induced in dieters, non dieters, obese, and normal weight individuals by having subjects fail on a concept formation task. In the non dysphoric condition, subjects were given an easy task to solve. Results indicated that only dieters ate more when dysphoric than non dysphoric. Moreover, once dieting status (dieting/non dieting) was controlled for, obesity/nonobesity was no longer a significant factor in explaining the effects of dysphoric mood on food consumption. Thus, dieting status was the crucial variable to consider when examining individuals' increased eating response to negative mood states. In a replication of the Baucom and Aiken (1981) study, Ruderman (1985) also found that dieters ate significantly more when dysphoric. Wardle and Beales (1988) also provide evidence that

experiencing stress can cause dieters to disinhibit. Obese women were randomly assigned to either a diet group (high restraint), an exercise group (low restraint), or a control group. After six weeks of treatment, all subjects were brought into a laboratory and asked to rate how frightening they found an excerpt from a horror film (*The Shining*, Stanley Kubrick, 1980). Sweets and nuts were available for subjects to "munch on" while watching. Results indicate a significant difference in eating between the three groups, with dieters eating three times as much as subjects in the other two groups. Herman, Polivy, Lank, and Heatherton (1987) used the Restraint Scale to evaluate dieting status and examined normal female college students' eating response to high and low stress. Psychological stress was induced by having subjects anticipate composing and singing an advertising jingle for ice-cream. The low stress condition consisted of having subjects think about qualities of ice-cream that would be useful in advertisement. Results indicated that dieters ate significantly more when anxious than calm whereas this effect was absent in non dieters.

Furthermore, in studies examining dieting individuals' adherence to weight loss programs, negative emotional states are identified as the greatest intrapersonal "high risk" situation for relapse (Marlatt & Gordon, 1985). Marlatt and Gordon (1985) define relapse as "any discrete violation of an imposed rule or set of rules governing the rate or pattern of consumption behaviors" (p.413). Dietary relapse resembles the concept of disinhibition from dietary restraint.

Thus, there are several converging lines of evidence from the obesity, restrained eating, and relapse prevention literatures



suggesting that dieting individuals are at high risk of disinhibiting from their dietary regimen when experiencing negative emotional states such as stress. Given the dietary restraint required in diabetes, it seems reasonable to suggest that disinhibition may mediate the relationship between stress and long term blood glucose control.

Stress Measurement and Diabetic Control: Early research attempts at measuring psychological stress in adult diabetics used non objective techniques such as clinical interpretations (Jordan & Kalich, 1971), retrospective reports (Nabarro, 1965), and stress interviews (Hinkle & Wolfe, 1952). Such measures lacked reliability and were not considered valid indices of stress. Recently, more objective measures of stress such as the Schedule of Recent Events (Holmes & Rahe, 1967) have been incorporated into diabetes research. Psychological stress is defined by such life events checklists as the cumulative (spanning several months) psychological effect of adjusting to life events, such as death of a loved one, moving, job promotion.

One criticism raised against the Holme's and Rahe life events checklist is its assumption that any life change (negative or positive) that requires social and emotional readjustment and adaptation is stressful. Given the possibility that positive and negative life events may differentially affect blood glucose levels, researchers examined these effects separately. Jacobson et al. (1985) administered to adult IDDM patients, the Life Expectancy Survey developed by Sarason (1979) which calculates positive and negative events separately. Results indicated significant correlations between negative but not positive life events and glucose control in diabetics with recent onset

retinopathy but not in diabetics without retinopathy. These findings provide only limited support for a relationship between negative life events and diabetic control in adults.

Another shortcoming of life events inventories is that they tap major life events that occur relatively infrequently in the lives of respondents. Thus, stress level experienced on a day to day basis may be misrepresented. Daily stress may be more important in predicting glucose control than relatively infrequent life events. In order to assess the relationship of daily stress and metabolic control, Cox et al. (1984) administered the Daily Hassles Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981) to adult IDDM patients. Cox et al. (1984) found significant correlations between daily life hassles and blood glucose levels. Furthermore, these investigators found that the majority of diabetics in their study indicated that perceived stress was a very potent factor in their control, and different stressors were reported as important for different individuals. Frenzel, McGaul, Glasgow, and Schafer (1988) recently found a significant relationship between high levels of perceived stress measured by The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) and poor glucose control in adult IDDM patients.

Although more research is needed, these studies indicate that perceived stress measures, which take into account several different stressors and which focus on cumulative daily negative events, and measure subjects' perceptions of life stress may provide an assessment of chronic stress relevant to measuring long term glucose control in adult diabetics.

Early research on child and adolescent populations also used life events inventories to measure stress (Bedell, Giordani, Amour, Tavormina, & Boll, 1977; Chase & Jackson, 1981). More recent research has utilized perceived stress measures with adolescents and included measures of dietary adherence as well as assessing glucose control. These studies are particularly important in that they are among the first to take a multivariate approach to examining the role of stress and compliance as predictors of physiological control. With few exceptions, most studies examining the effects of stress on metabolic control have not attempted to determine whether stress influences metabolic control by interfering with compliance behavior.

Stress, Diabetic Control, Restraint and Disinhibition: Few studies exist which investigate the combined effects of stress and disinhibition on diabetic control. Interestingly, those which do exist have often utilized adolescent populations. Hanson and Pichert (1986) examined the relationship between everyday stressors and blood glucose control in IDDM adolescents attending a summer camp. The authors developed and administered a 36 item stress questionnaire designed to elicit adolescents' perceptions of positive and negative life stressors. Negative cumulative stress was significantly associated with poor metabolic control. Results also indicated that adherence behaviors (diet, exercise) were not associated with degree of metabolic control. Moreover, negative cumulative stress significantly correlated with blood glucose levels even after controlling for the effects of adherence variables. There are several methodological limitations in this study; the authors themselves criticized the nonstandardized measure of stress

used and note that campers had easy access to the kitchen for unsupervised and unrecorded dietary deviations.

Hanson et al. (1987) examined the indirect effects of stress on diabetic adolescents' metabolic control using a perceived stress measure. Adherence behaviors were measured by self-report of diet, insulin adjustment, hypoglycemia, glucose testing and foot care. Stress was measured by adolescents' perceptions of individual and family life change during the past year (McCubbin, Patterson, Bauman, & Harris, 1985). Results indicated that high stress and low adherence correlated significantly with poor metabolic control. However high stress was not associated with decreased adherence. These results fail to support the idea that adherence can mediate the effects of stress on glucose control.

One limitation to the Hanson et al. (1987) study is its assumption that all adherence behaviors should be summed to represent one general adherence score. Adherence to one aspect of the diabetic regimen can be independent of compliance to other regimen components (Schafer, Glasgow, McCaul, & Dreher, 1983; Frenzel et al., 1988). In particular, Frenzel et al. (1988) found that the only adherence variable significantly correlated with perceived stress was deviations from diet. High perceived stress was associated with excess caloric consumption and with poor metabolic control. Ruggiero, Spirito, Bond, Coustan, and McGarvey (1990) also found daily hassles to be associated with poor dietary control but not with poor insulin compliance among gestational diabetic women. Unfortunately, both these studies provide only simple correlations rather than multivariate analyses of the relationship among

stress, adherence, and blood glucose control.

In summary, there is some support for a relationship between chronic measures of stress and poor metabolic control in diabetics (Frenzel et al., 1988; Hanson et al., 1987). However, the relationship between stress and dietary lapses is mixed. Frenzel et al. (1988) and Ruggiero et al. (1990) find correlations linking these variables. However, several other studies fail to support such a relationship. Continued research is necessary to confirm a relationship between stress and dietary adherence. It is essential that such research use a measure of compliance that emphasizes dietary lapses or disinhibition. Further, it seems important to study the multivariate relationship among perceived stress, dietary disinhibition and glucose control.

#### Self-Esteem

There is sufficient evidence relating self-esteem to disinhibition and diabetic control to warrant including a measure of self-esteem in the multivariate relationships being investigated. First, self-esteem has been examined with respect to disinhibition among nondiabetic dieters. Polivy, Heatherton, and Herman (1988) found college women who were high restrainers and scored low on self-esteem disinhibited in a laboratory situation. Restrainers with high self-esteem did not disinhibit. Secondly, diabetics with high self-esteem report better dietary adherence than diabetics with low self-esteem (Jacobson et al., 1987). Perhaps, individuals with low self-esteem who must diet experience inferior expectations for success and feel less capable of resisting challenges to their diet and therefore disinhibit. Finally, though on average diabetics do not suffer from low self-esteem (Anderson

et al., 1981; Brown, 1985; Gross et al., 1983; Ryan & Morrow, 1986; Ryan et al., 1985; Sullivan, 1978; Tarvornina et al., 1976), studies do indicate that self-esteem scores among diabetics vary considerably and at least one study reports a significant relationship between poor blood glucose levels and low self-esteem (Anderson et al., 1981).

In spite of the fact that several studies have failed to confirm a relationship between self-esteem and glucose control (Barlow et al., 1983; Rovet et al., 1987; Simonds et al., 1981), examining self-esteem's association with glucose control, disinhibition, and stress seems warranted. In the present study, it is predicted that high stress and low self-esteem are associated with both high disinhibition and poor blood glucose control in diabetic young women.

### Statement of the Problem

The present investigation focusses on the relationship between dietary disinhibition and blood glucose control in diabetic female patients. To date, disinhibition has not been assessed in diabetics. However, restraint theory and studies of nondiabetic dieters indicate that high dietary restraint is related to disinhibition, and that restraint is common in young women (Polivy & Herman, 1987). Thus, it seems reasonable to suggest that diabetics, who are required to engage in dietary restraint, are likely to disinhibit. Moreover, eating disorders and anorexic-like behaviors which are related to restraint and disinhibition are prevalent in 10-20% of diabetic young women (Hudson et al., 1985; Rodin et al., 1985; Rosemark et al., 1986) and are associated with poor glucose control (LaGreca et al., 1987; Rodin et al., 1985). Such findings underline the need to study disinhibition and its relationship to glucose control in young diabetic women. It is predicted that high dietary disinhibition is related to poor blood glucose control in diabetic female patients.

The second goal of this research is to investigate how psychological stress and self-esteem pertain to disinhibition in diabetic young women. Studies supporting an association between stress and disinhibition indicate that high stress results in overeating in nondiabetic obese and normal weight female dieters (Baucom & Aiken, 1981; Herman et al., 1987; Leon & Chamberlain, 1973; McKenna, 1972; Slochower & Kaplan, 1980; Wardle & Beales, 1988). Evidence also exists linking high stress with poor dietary adherence in diabetics (Frenzel et al., 1988; Ruggiero et al., 1990). Two studies support an association between self-esteem and dietary disinhibition. In a laboratory study,

Polivy et al. (1988) found that dieters with low self-esteem are more likely to disinhibit than dieters with high self-esteem. Findings from Jacobson et al. (1987) also indicate that diabetics with low self-esteem report less dietary adherence than those with high self-esteem. Thus, it is predicted that both high stress and low self-esteem will be associated with dietary disinhibition in female diabetic patients.

The association of self-esteem and stress in relation to blood glucose control is also investigated in this study. Results from previous studies examining self-esteem and blood glucose are inconsistent; some indicate an association between low self-esteem and poor glucose control (Anderson et al., 1981), and others do not (Barlow et al., 1983; Rovet et al., 1987; Simonds et al., 1981). Results from the present study should help clarify the relationship between self-esteem and blood glucose. Studies investigating the association between chronic stress and blood glucose control also yield inconsistent findings (Cox et al., 1984; Frenzel et al., 1988; Hanson & Pichert, 1986; Hanson et al., 1987; Jacobson et al., 1985). One possible explanation for discrepancies in the associations between stress and glucose control concerns the mediating role of dietary disinhibition. In order to test this hypothesis, a multivariate statistical procedure is used to determine whether stress can indirectly influence glucose control by interfering with dietary adherence.

The present study extends previous diabetes research and attempts to integrate discrepant findings by using multivariate analyses to investigate the relationship among stress, self-esteem, blood glucose control, and dietary disinhibition in a specific diabetic subgroup for



whom dieting behavior is particularly salient.

## METHOD

### Subjects

Subjects included sixty-five IDDM female patients ranging in age from 12-26 years, with a mean age of 16.7 years (S.D.=2.9). The average age at diagnosis was 9.7 years (S.D.=3.9). All subjects had been diagnosed as diabetic for at least one year to avoid confounded blood glucose levels due to possible significant residual insulin secretions (Delamater, 1986).

Several factors were considered in selecting the sample size of 65 subjects. All available patients from the diabetic clinic at the Montreal Children's Hospital who met age, sex, and diagnostic criteria were recruited (n=56). In order to increase the sample size, older patients (>18 years old) who were transferred from the Montreal Children's Hospital to the Montreal General Hospital while still under the care of the same physician, Dr. Alicia Schiffrin, were recruited to participate in the study in a similar manner (n=9). Tabachnick and Fidell (1983) recommend a minimum of 5, and preferably 10, subjects for each predictor variable in a multiple regression. Five predictor variables (age, duration of IDDM, perceived stress level, self-esteem, and disinhibition) were used to predict glucose levels. Thus, the criteria of 10 subjects per predictor variable was satisfied.

In order to recruit 65 subjects, it was necessary to interview patients in both English and French. A series of t-tests revealed that English (n=39) and French (n=26) subjects did not significantly differ on any of the relevant variables such as stress, self-esteem, restraint, disinhibition, and blood glucose. T-test results are included in Appendix A. Thus, in all subsequent analyses subjects were pooled

across language.

### Procedure

During outpatient diabetic clinic visits, patients who met the age, sex, and diagnostic criteria, were recruited to participate in a study examining "how emotions can play a role in diabetic control". The study was described to patients and they were asked to read and sign a consent form indicating that they agreed to participate. Parental consent was obtained for patients less than 18 years old. A copy of the consent form is attached in Appendix B.

Questionnaire packages consisting of a self-esteem inventory, an eating habits questionnaire, and a perceived stress inventory were completed by patients after they had given their routine blood samples and were awaiting consultation with their physician. Any questions that the patients had about the study were answered after the questionnaires were completed. As well, each patient was promised a summary of the results of this study.

### Measures

Blood Glucose Control (HbA1c): Blood glucose control can be evaluated by several methods. Traditional blood glucose assessment techniques such as daily urine glucose tests, 24-hour estimations of glycosuria, and fasting and/or random blood glucose measurements are useful in helping diabetics monitor their sugar levels in order to adjust daily insulin and dietary requirements. However, as these indices are greatly influenced by daily variations in diet, activity level, and insulin dosage, and are easily falsified by good compliance on clinic appointment day, they have limited utility in evaluating long

term glucose control. Currently, Hemoglobin A1c (HbA1c) level is widely accepted as the most accurate indicator of long term glycemic control in diabetic patients (Nathan, Singer, & Hurxthal, 1984).

Glycohemoglobin assays measure the amount of hemoglobin nonenzymatically bound to glucose and thus reliably indicate net levels of blood glucose control 6-8 weeks prior to testing (Gonen, Rachman, & Rubenstein, 1977). Moreover, the HbA1c assay is a valuable clinical and research tool because it provides a measurement of metabolic control that is independent of potential confounding variables such as patient's level of cooperation, time of day, insulin administration, and mealtime (Mann & Johnston, 1982). Thus, as traditional methods of assessing blood glucose control are unreliable, nonspecific, and insensitive with regard to control over time, the HbA1c assay provides a valid retrospective long term index of metabolic control that is not otherwise available in the clinical setting (Nathan et al. 1984). As long term diabetic control is of interest in this study, the HbA1c assay obtained by venous puncture as a routine part of each patient's scheduled clinic visit was used as the measure of blood glucose control. HbA1c laboratory procedures at the Montreal Children's Hospital and Montreal General Hospital yield nondiabetic HbA1c values ranging from 3.5-5.5 and values for diabetics in good control <7, adequate control 7-8, and poor control >8.

Perceived Stress: A modified version of Cohen et al.'s, (1983) measure of perceived level of stress was used. The original scale measures perceived stress during the preceding month. We changed these instructions to two months in order to coincide with the duration of

diabetic compliance measured by HbA1c.

The Perceived Stress Scale (PSS) is a 14 item measure of the degree to which respondents appraise their lives as stressful, unpredictable, uncontrollable, or overloading on a 4 point scale. An example of an item is: "In the last 2 months, how often have you felt difficulties were piling up so high that you could not overcome them?" Total scores on the PSS can range from 0 to 56 and are determined by summing scores on all items. A score of 0 indicates that the respondent perceived her life as absolutely stress free and a score of 56 signifies that she very often experienced stress. A copy of the PSS is attached in Appendix C.

Psychometrically, the PSS has shown adequate reliability and validity. The coefficient alpha reliability ranges from .84 -.86 (Cohen et al., 1983). In terms of validity, the PSS has been significantly correlated with life-events scores, depressive and physiological symptomatology, utilization of health services, social anxiety, and smoking reduction maintenance. Furthermore, in all of the aforementioned comparisons, the PSS was a better predictor of the outcome in question than were life-events scores (Cohen et al., 1983).

Eating Habits Questionnaire: The extent to which individuals disinhibit from dietary restraint was evaluated using the Three Factor Eating Questionnaire developed by Stunkard & Messick (1985), which is a modified version of Herman's Restraint Scale (Herman & Polivy, 1975). Stunkard's questionnaire measures three dimensions of eating behavior (1) cognitive restraint, (2) disinhibition, and (3) perceived hunger.

Scores on the cognitive restraint scale can range from 0 to 21, with high scores indicating high dietary restraint. In items measuring

restraint, subjects are asked to indicate "yes" or "no" to statements such as, "I consciously hold back at meals in order not to gain weight". A positive endorsement of this item would indicate restraint. Disinhibition scores can range from 0 to 16, with high scores indicating that respondents often disinhibit and break their diet. An example of a disinhibition item is "When I feel blue, I often overeat". Responding "yes" to this item indicates dietary disinhibition. Hunger scores on this scale can range from 0 to 14, where high scores indicate that respondents often experience the subjective state of hunger. An example of a hunger item is "I sometimes get very hungry late in the evening or at night". A copy of the Three Factor Eating Questionnaire is found in Appendix D.

The coefficient alpha reliabilities for the three factors on adult samples are .92 for factor 1 (conscious control), .91 for factor 2 (disinhibition), and .85 for factor 3 (perceived hunger) (Stunkard & Messick, 1985). A children's version of the Eating Habits Questionnaire, has coefficient alpha reliabilities for 7-13 year olds of .74 for Factor 1, .67 for Factor 2, and .68 for factor 3 (Isbitsky, 1987).

Test-retest reliabilities over one month with adults are .93 for Factor 1, .80 for factor 2, and .83 for factor 3 (Ganley, 1982, cited in Stunkard & Messick, 1985). One week test-retest reliabilities with children are .80 for Factor 1, .75 for Factor 2, and .67 for Factor 3 (Isbitsky, 1987).

In terms of predictive validity, the disinhibition factor predicts weight change in people suffering from clinical depression (Weissenburg,

Giles, Stunkard, 1985, cited in Stunkard & Messick, 1985). Evidence for criterion validity is supported by the finding that among individuals suffering from binge eating, binge severity correlates highly with factor II, disinhibition ( $r=.61$ ,  $p<.001$ ) but not with factor 1, cognitive restraint ( $r=-.14$ , NS) (Marcus & Wing, 1983, cited in Stunkard & Messick, 1985).

Self-Esteem: The Piers-Harris Children's Self-Concept Scale (Piers & Harris, 1969) was used to measure self-esteem. The Piers-Harris is a self-report 80 item questionnaire standardized on 8-17 year olds and assesses how they feel about themselves in six areas: behavior, physical appearance, popularity, intellectual status, happiness, and anxiety. Both global self-esteem as well as sub-scale scores are available. In the present study, only the global self-esteem score was considered. Subjects were asked to circle yes or no in response to items. Examples of some items are "I feel strong", "I like being the way I am", "I have good ideas". A copy of the Piers-Harris Self-Concept Scale is found in Appendix E.

This scale has an internal consistency (based on Kuder-Richardson 21) of .78-.93 (Piers & Harris, 1969) and a test-retest reliability (over 6 weeks) of .90 (Wolf, Hunter, & Webber, 1979) and .79 (Wolf, Hunter, Webber, & Berenson, 1981). Validity studies demonstrate relations between the Piers-Harris and other self-concept measures ranging from .32-.85 (Chiu, 1988). Overall, the Piers-Harris has been rated as the most psychometrically valid instrument for measuring adolescents' self-esteem (Crandall, 1973; Jeske, 1985; Wylie, 1974).

### Translation

Each of the three questionnaires was translated into French. Unfortunately, it was beyond the scope of the current thesis to collect normative data using the French version of the instruments. In order to verify the translated forms, an independent translation back to English was conducted, compared, and found to parallel the original English version. A copy of each of the French forms is included in Appendix F.



## RESULTS

### Descriptive Data for the Whole Sample

The total sample consists of 65 subjects for whom complete data are available. The ranges, means, and standard deviations for all variables are reported in Table 1. As can be seen, there are adequate ranges of HbA1c values, perceived stress, disinhibition, restraint, hunger, and self-esteem scores.

Perceived stress scores range from 6 to 46 with a mean of 23. These results are comparable to scores obtained on standardization samples of female college students (mean age =19) whose average perceived stress scores are 23.6 and 25.7 (Cohen et al. 1983). Thus as a group these diabetic young women perceive their lives as no more stressful than the average nondiabetic college woman. Self-esteem scores are reported in percentile scores based on normative tables (Piers-Harris, 1969). Self-esteem scores in this sample range from the 14th to the 97th percentile, where high scores indicate high self-esteem. The mean self-esteem score is 63.8 (S.D.=24.8) and is above the 50th percentile of the Piers-Harris normative sample. Such scores indicate that the self-esteem of this diabetic sample is intact.

Scores on the restraint scale can range from 0 to 21. In this sample scores vary from 4 to 19 with a mean of 11.7 (S.D.=4.2). Disinhibition scores can range from 0 to 16. Subjects' scores from 1 to 15 with a mean of 6.0 (S.D.=3.3) are found. Hunger scores on this scale can range from 0 to 14. In this sample, scores range from 1 to 14 with a mean of 5.2 (S.D.=2.8). A comparison between restraint, disinhibition, and hunger scores for this diabetic sample and scores from nondiabetic

Table 1

Range, Mean, and Standard Deviation for Age, Duration of IDDM, HbA1c, Perceived Stress, Self-esteem, Restraint, Disinhibition, and Hunger.

Variable	Range	Mean	Standard Deviation
Age	12.1-26.7 (yrs)	16.7 (yrs)	2.9
Duration of IDDM	1.0-21.7 (yrs)	6.9 (yrs)	4.6
HbA1c	3.9-12.2	7.5	1.6
Perceived Stress	6.0-46.0	22.6	8.3
Self-esteem	14.0-97.0	63.8	24.8
Restraint	4.0-19.0	11.7	4.2
Disinhibition	1.0-15.0	6.1	3.3
Hunger	1.0-14.0	5.2	2.8

college aged female dieters and non dieters (Stunkard & Messick, 1985) and a younger sample of nondiabetic obese and nonobese girls (Isbitsky, 1987) are reported in Table 2. Diabetics' average restraint score is between that of dieters/obese and normal weight individuals; their mean disinhibition score is closer to scores obtained by normal weight girls than dieters; their average hunger score is similar to that reported by normal weight eaters.

HbA1c laboratory procedures at the Montreal Children's Hospital and Montreal General Hospital yield nondiabetic HbA1c values ranging from 3.5-5.5 and values for diabetics in good control <7, adequate control 7-8, and poor control >8. In the present sample, HbA1c values are normally distributed ranging from excellent control (3.9) to very poor control (12.2).

Overall the mean HbA1c score for this sample is 7.5 (S.D. = 1.5), indicating that these diabetic female patients on average have adequate blood glucose control.

#### Tests of Assumptions and Variable Selection

Data were evaluated to ensure all assumptions regarding multivariate statistical analyses were met. Normality was evaluated by tests of skewness. All variables were normally distributed except for disinhibition which was moderately positively skewed. Square root transformation normalized the distribution of disinhibition scores. Z-Score transformations indicated no outliers on any variables beyond  $\pm 3$  Z-scores.

In order to verify the assumptions of univariate and multivariate linearity and homoscedasticity, a scatter plot of residuals was

Table 2

Comparing Restraint, Disinhibition, and Hunger Scores Between  
This Diabetic Sample and Nondiabetic Populations.

	<u>Restraint</u>		<u>Disinhibition</u>		<u>Hunger</u>	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Diabetic females	11.7	4.2	6.1	3.3	5.2	2.8
Dieters	14.3	3.6	13.8	4.2	7.2	3.9
Free eaters	6.0	5.5	5.6	4.3	7.0	4.3
(Stunkard et al 1985) - adults						
Obese girls (13 - 16 yr olds)	13.8	3.5	7.4	2.1	4.8	2.8
Normal girls (13 - 16 yr olds)	7.6	3.8	5.3	3.8	5.1	5.1
(Isbitsky, 1985)						

performed. An examination of residuals indicated no serious departures from linearity.

#### Dietary Disinhibition and Blood Glucose Control

Pearson product-moment correlation coefficients were calculated to assess the zero-order associations between disinhibition, age, duration of IDDM, and blood glucose control (HbA1c). Age and duration of diabetes were included as control variables because previous research on diabetes indicates that they are sometimes related to metabolic control (Hanson et al., 1989; Goldstein, Walker, Rawlings, Hess, England, Peth, & Hewett, 1980). As shown in Table 3, HbA1c is significantly correlated with duration of IDDM and disinhibition. Because high HbA1c values signify poor metabolic control, these analyses indicate that poor metabolic control is linked with longer duration of diabetes and high dietary disinhibition.

In order to determine whether dietary disinhibition predicts poor blood glucose control above and beyond variance accounted by control variables, a hierarchical multiple regression analysis was performed. Age and duration of IDDM were entered as control variables on the first step; disinhibition was added on the second step. Results as reported in Table 4, indicate that the two control variables (age and duration of IDDM) do not significantly predict HbA1c ( $R^2=.05$ ,  $F(2,62)=1.49$ ,  $p<.24$ ). On the second step, disinhibition significantly increases the proportion of predictive variance ( $R^2=.14$ ,  $F(3,61)=3.31$ ,  $p<.05$ ). Examining the squared semi-partial correlation coefficients reveals the unique variance contribution of each independent variable in predicting HbA1c. On the second step, the only individual variable which significantly

Table 3

Pearson Correlations Between HbA1c and Age, Duration of IDDM,  
and Dietary Disinhibition.

---

	Age	Duration of IDDM	Dietary Disinhibition
HbA1c	.16	.21 *	.33 **

---

\*  $p < .05$

\*\*  $p < .01$

Table 4

Staged-hierarchical Regression Predicting HbA1c Levels

<u>Variable</u>	<u>Beta</u>	<u>Sr<sup>2</sup></u>
<u>Step 1</u>		
Age	.07	.00
Duration of IDDM	.17	.02
	$R^2 = .05$	
<u>Step 2</u>		
Age	-.06	.00
Duration of IDDM	.21	.03
Disinhibition	.33 **	.09
	$R^2 = .14 *$	

\*  $p < .05$ \*\*  $p < .01$

predicts blood glucose is disinhibition, accounting for 9% unique predictive variance. These findings offer support for the hypothesis that reports of high dietary disinhibition among diabetic young women are indicative of poor blood glucose control.

#### Dietary Disinhibition, Stress, and Self-Esteem

Psychological stress and self-esteem were posited as predictors of dietary disinhibition. Pearson correlations were calculated to assess the associations between stress, self-esteem, dietary disinhibition, age, and duration of diabetes. It was predicted that high stress and low self-esteem would be associated with high dietary disinhibition. As seen in Table 5, and as predicted high stress and low self-esteem are both significantly correlated with high dietary disinhibition. Thus, diabetic young women with low self-esteem and diabetics who perceive their lives as very stressful are more likely to disinhibit. Furthermore, perceived stress scores are significantly correlated with low self-esteem. Thus, diabetics with low self-esteem report their lives as more stressful.

Age is significantly positively correlated with duration of IDDM, perceived stress, and disinhibition. Thus, older diabetics have had diabetes for a longer period of time, perceive their lives as more stressful, and are more likely to disinhibit. Age is also significantly negatively correlated with self-esteem indicating that older diabetics have poorer self-esteem.

A two-step staged hierarchical multiple regression analysis was performed to examine whether adding information regarding perceived stress and self-esteem could improve the prediction of diabetics'



Table 5

Pearson Correlations Among Age, Duration of IDDM, Perceived Stress, Self-Esteem, and Disinhibition.

---

	Duration of IDDM	Perceived Stress	Self- esteem	Disinhibition
Age	.55 ***	.33 **	-.22 *	.32 **
Duration of IDDM		.20	.01	.10
Perceived Stress			-.57 ***	.38 ***
Self- esteem				-.31 **

---

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

disinhibition scores beyond that already accounted for by the control variables age and duration of diabetes.

Age and duration of diabetes were entered together on the first step; perceived stress and self-esteem were entered simultaneously on the second step. Results as shown in Table 6 indicate that on the first step, age and duration of IDDM account for a significant proportion of variance in predicting disinhibition ( $R^2=.11$ ,  $F(2,62)=3.99$ ,  $p<.02$ ). On the second step, perceived stress and self-esteem significantly increase the proportion of explained variance by 9% ( $R^2=.20$ ,  $F(4,60)=3.85$ ,  $p<.008$ ). Thus, as predicted, high levels of perceived stress and low self-esteem scores significantly predict dietary disinhibition above and beyond variance accounted by control variables.

The standardized regression coefficient (Beta), semi-partial correlation squared (Sr<sup>2</sup>), and R<sup>2</sup>, for both steps in the analyses are presented in Table 6. Examining the squared semi-partial correlations reveals the unique variance contribution of each independent variable in predicting disinhibition. Age is the only variable demonstrating significant unique predictive variance. Although psychological stress and self-esteem together significantly predict disinhibition, neither variable has significant unique predictive variance. Thus, much of stress and self-esteem's power in predicting disinhibition is shared variance.

#### Self-Esteem, Stress, and Blood Glucose Control

The second part of this study was designed to assess the association between the psychological variables stress and self-esteem and blood glucose control. The hypothesis that low self-esteem would be

Table 6

Staged-hierarchical Regression Predicting Disinhibition

Variable	<u>Beta</u>	<u>Sr<sup>2</sup></u>
<u>Step 1</u>		
Age	.39 **	.11
Duration of IDDM	-.12	.01
	$R^2 = .11 *$	
<u>Step 2</u>		
Age	.28 *	.05
Duration of IDDM	-.11	.01
Perceived Stress	.24	.04
Self-esteem	-.11	.01
	$R^2 = .20 **$	

\*  $p < .05$ \*\*  $p < .01$

associated with poor blood glucose control was not supported ( $r=-.06$ ,  $p<.33$ ). However, support was found for the hypothesis that high stress would be associated with poor blood glucose control ( $r=.25$ ,  $p<.05$ ). The relationship between stress and blood glucose control was further examined by the following procedure.

#### Testing Indirect Effects of Stress on Blood Glucose Control

Baron and Kenny's (1986) statistical technique for testing mediation was used to determine whether stress can indirectly influence blood glucose control by interfering with dietary adherence. In such analyses, dietary disinhibition is considered the "mediator" through which the independent variable (stress), exerts its effect on the dependent variable (blood glucose) (Figure 1).

In testing for mediation, the following three regression equations must be conducted; (i) The mediator (disinhibition) must be regressed on the independent variable (stress), (ii) the dependent variable (blood glucose) must be regressed on the independent variable (stress), and (iii) the dependent variable (blood glucose) must be regressed on both the independent variable (stress) and the mediator (disinhibition). Results indicate that all conditions required for mediation were met: (1) stress significantly predicts dietary disinhibition ( $R^2=.14$ ,  $F(1,63)=10.3$ ,  $p<.002$ ), (2) stress significantly predicts blood glucose ( $R^2=.06$ ,  $F(1,63)=4.3$ ,  $p<.05$ ), (3) when both stress and disinhibition are entered together as predictors of blood glucose control, only disinhibition significantly predicts blood glucose (table 7), and (4) the previously significant relation between stress and blood glucose is no longer significant when the effects of disinhibition are considered.

**Figure 1:** Dietary Disinhibition as a Mediator in the Relationship Between Perceived Stress and Blood Glucose Control

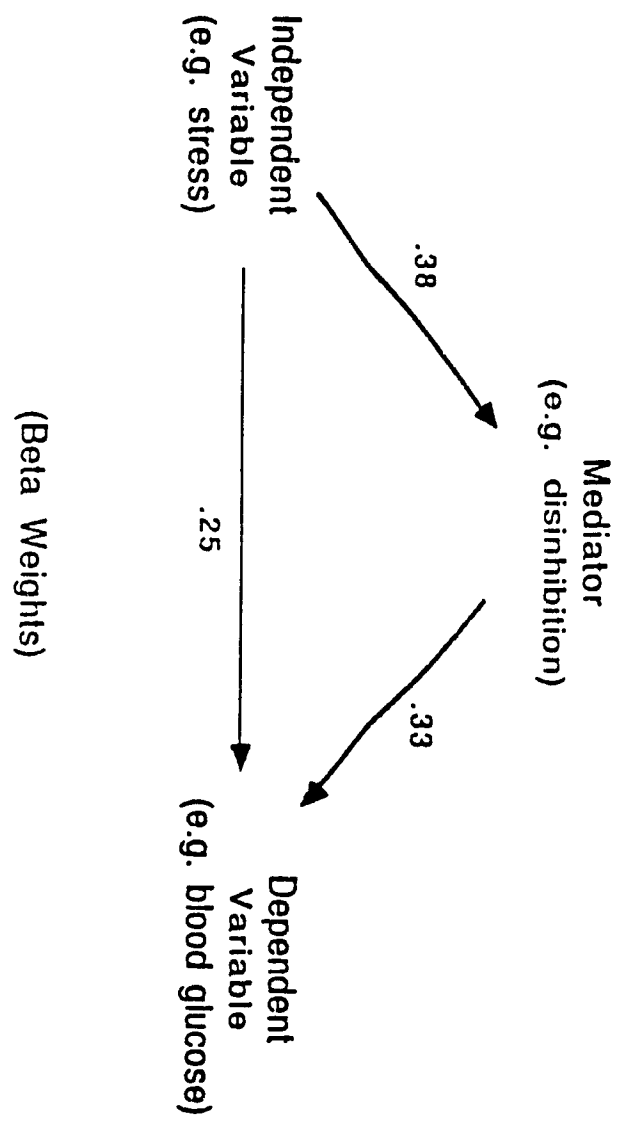


Table 7

Direct Multiple Regression Predicting Blood Glucose (HbA1c)

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Variable	<u>Beta</u>	<u>Sr<sup>2</sup></u>
Perceived Stress	.15	.02
Dietary Disinhibition	.27 *	.06

---

$R^2 = .13 **$

---

\*  $p < .05$

\*\*  $p < .02$

The beta weights representing the relationships between the variables are shown in Figure 1. Together, these results offer evidence that stresses' negative impact on blood glucose control can be indirectly mediated by disrupting dietary adherence.

## Discussion

Findings from previous research examining stress and self-esteem in both nondiabetics and diabetics suggested that the diabetic female patients in this sample would have intact self-esteem and stress scores. Based upon the rigid dietary adherence required by diabetic treatment regimes, it was expected that diabetic young women might differ from nondiabetics on measures of eating behavior. Though a nondiabetic control group was not included in the present study, scores on these variables were compared to those reported in standardization samples and studies using other populations. As noted in Table 2, the mean dietary restraint score for the diabetics was closer to scores obtained from dieters (Stunkard et al., 1985) and obese girls (Isbitsky, 1987) than free eaters. The mean disinhibition score for these diabetic females was slightly higher than scores obtained by free eaters but much lower than scores reported by dieters and obese girls. Thus, as a group these diabetics do disinhibit, but not to the extent of young women with deviant eating patterns or overweight girls. These diabetics also exhibited adequate glucose control, which is consistent with moderate levels of disinhibition. Their hunger scores were comparable to values obtained by both dieters and non dieters.

The average self-esteem score of this sample of diabetic female patients was comparable with nondiabetic norms. These results are consistent with previous research findings (Sullivan, 1978; Tavormia et al., 1976; Delbridge, 1975). Thus, when objective measures of self-esteem are used, diabetic young women on average demonstrate adequate self-concepts. The average stress score for this diabetic sample was also comparable to scores reported by nondiabetic students (Cohen et



al., 1983). Thus, as a group these diabetic young women perceived their lives as no more stressful than their nondiabetic peers. Together, these findings suggest that our sample of diabetics is coping well with their disease and treatment regimen. Self-esteem is intact and they do not perceive their lives as highly stressed; they maintain adequate glucose control and report somewhat elevated restraint and disinhibition scores. However, there are considerable ranges in scores for all measures. This variability suggests that some of these young women are not coping with their diabetes as well as others and that this group provides a sample well suited to studying factors related to variations in dietary disinhibition and glucose control.

#### Dietary Disinhibition & Blood Glucose Control

The first hypothesis of this study, that diabetic young women who report high dietary disinhibition would suffer from poor glucose control, was supported. Results from a hierarchical regression analysis indicate that even when controlling for age and duration of diabetes, high dietary disinhibition predicts poor blood glucose control. The link between disinhibition and blood glucose control is noteworthy and cause for concern because chronic elevations in blood glucose can lead to potentially fatal long term physiological complications (Cahill et al., 1976). High dietary disinhibition has been posited as a precursor to bingeing and the development of eating disorders (Polivy & Herman, 1985). Eating disorders are prevalent in diabetic young women and are also associated with poor glucose control (Rodin et al., 1985; Wing et al., 1986; Rosemark et al., 1986). Though correlational, the findings of this study raise the possibility that disinhibition may be harmful in

its own right, and potentially more harmful as a precursor to severe eating disorders and poorer blood glucose control.

#### Factors Related to Dietary Disinhibition

Psychological stress and self-esteem are constructs posited to influence dietary disinhibition. Results from a staged hierarchical regression analysis indicate that age and duration of IDDM significantly predict disinhibition and that stress and self-esteem together add significant predictive variance beyond that already accounted for by age and duration of IDDM.

These results offer support for the hypothesis that both high stress and low self-esteem are associated with high disinhibition. These findings are consistent with studies showing that dieting college women are more likely to break their diets when stressed (Herman et al., 1987), and evidence that negative emotions are "high risk" situations for dietary relapse both among weight loss dieters (Marlatt & Gordon, 1985) and type 1 diabetics (Kirkley & Fisher, 1988). These results also replicate previous findings that diabetics with low self-esteem are not as likely to comply with their dietary regimen as those with high self-esteem (Jacobson et al., 1987; Hanson et al., 1987). Furthermore, these results are congruent with findings that chronic dieters with low self-esteem are more likely to disinhibit (Polivy et al., 1988) and are consistent with evidence that bulimics have lower self-esteem than individuals without eating pathology (Katzman & Wolchik, 1984).

It is of interest that stress is related to dietary control but not to other diabetic adherence behaviors (Ruggiero et al., 1990; Frenzel et al., 1988). This finding is difficult to explain, but may be related to

the socialization of eating behavior, particularly in girls. Woody & Costanzo (1981) discuss findings that parents report higher expectations for dietary restraint in daughters than sons and attribute eating in girls to emotional cues such as boredom, depression, and stress. Thus, girls may learn to attribute disinhibition to negative emotions and/or to cope with negative feelings by eating. Diabetic females who constantly deny themselves the pleasure of eating highly palatable foods may cope with stress by releasing their dietary inhibitions and indulging in a previously denied pleasure. "I'm so worried about tomorrow's interview! Eating some chocolate ice-cream will definitely make me feel better."

Social pressure to accept inappropriate food offers "Go ahead and taste my cake, it's a birthday party!" and eating in restaurants are identified by diabetics as situations in which it is very difficult to comply with their diet (Ary et al., 1986). Publicly refusing food offers and requesting special dishes in restaurants necessitates assertiveness and may lead to self-consciousness in social situations. Diabetics with low self-esteem may not feel confident enough to conspicuously request special foods and make their diabetic condition public knowledge. For diabetics with low self-esteem, disinhibiting from their diet may be less threatening than asserting themselves. The association between low self-esteem and dietary nonadherence may also be related to difficulties in integrating diabetes into one's self-image. By disinhibiting from their diet, diabetics may be denying the existence of their illness.

Age in the present study was also a significant predictor of dietary disinhibition; older diabetics reported higher dietary disinhibition. This inverse relationship between adolescents' age and dietary compliance is consistent with previous research findings (Jacobson et al., 1987; Hanson et al., 1987). For most young diabetics, diabetic adherence is closely monitored and controlled by parents and physicians. As the adolescent ages, spends more time with peers, and gains independence from both parents and medical staff, dietary adherence may falter. Diabetic adolescents need to be well prepared for this transition.

A second possible explanation for the association between age and dietary disinhibition in the present study, is that older diabetics more closely match the age range (college women) in which dietary disinhibition and bingeing are most prevalent (Halimi, Falk, & Schwartz, 1981; Hawkins & Clement, 1980).

Age was also significantly associated with high stress. Older diabetics in this study perceived their lives as more stressful than younger ones. This finding is consistent with evidence that 15-18 year old diabetics experience more stress than 6-14 year olds (Chase & Jackson, 1981). Age in this study was also significantly associated with low self-esteem. Older diabetics had lower self-esteem scores. Together, these findings suggest that the implications and limitations of diabetes may become more salient and stressful during later adolescence and young adulthood.

To summarize, as young diabetic female patients age and gain independence from parents and medical supervision, pressures to conform

with peers may increase and maintaining dietary restraint becomes more difficult. Approaching and entering young adulthood, their perceptions of life stress also increase. Many young diabetic women, especially those with low self-esteem, cope with stress by disinhibiting from their diet. This coping strategy may have been socialized and reinforced by early parental attitudes towards eating behavior.

Although stress, self-esteem, age, and duration of diabetes are all associated with dietary disinhibition, together they account for only 20% of the variance in predicting disinhibition. Much of the variance remains unexplained and other factors are contributing to disinhibition. One factor potentially influencing dietary adherence is social support. Recently, social support with specific diabetes adherence requirements (e.g. dietary adherence) has been associated with good compliance (Glasgow & Toobert, 1988). Future research should be directed towards further delineating specific psychological factors associated with poor dietary adherence.

#### Factors Related to Blood Glucose Control

This study also examined the relationships of both perceived stress and self-esteem to glucose control. In view of inconsistent findings regarding these relationships, it was of particular interest to determine whether the effects of either stress or self-esteem on glucose control were mediated by dietary disinhibition. No relationship was found between self-esteem and glucose control. However, high levels of perceived stress were significantly associated with poor glucose control and were found to be mediated by high dietary disinhibition. This finding is important, as it is the first empirical evidence supporting

the long standing medical assumption that psychological stress can disrupt diabetic control by interfering with dietary compliance behavior.

Most studies examining the relationship between stress and metabolic control assume direct effects without incorporating adherence behaviors into their design (i.e Brand, Johnson, & Johnson, 1986; Barglow et al., 1983). Studies which have considered adherence behavior use measures of adherence that are lacking in specificity and comprehensiveness. Global measures of adherence derived from summing together one item responses corresponding to the various diabetic adherence criteria (diet, exercise, insulin injection, urine testing) are common. Studies using such global adherence measures have failed to demonstrate any indirect relationship between stress and blood glucose (Cox et al., 1984; Hanson et al., 1987). However, it may be that stress does not interfere with all adherence behaviors equally. Recent studies indicate that dietary control is more vulnerable to disruption by stress than the other diabetic adherence components (Frenzel et al., 1988; Ruggiero et al., 1990). Thus, global adherence measures can potentially mask specific relationship between stress, individual adherence criteria, and metabolic control. In the present study, one concise measure of diabetic nonadherence (dietary disinhibition) was used. Furthermore, this study consisted solely of young IDDM females. Dieting behavior is very salient in the lives of many young women in today's society. Thus, this study helped clarify discrepant findings in the literature by using a specific measure of adherence that was particularly important for a distinctive diabetic subgroup. The specificity of this design enabled

the indirect relationship between psychological stress and blood glucose to emerge. Dietary disinhibition mediated the relationship between perceived stress and blood glucose. Future research examining the relationship between psychological constructs, noncompliance, and glucose control should be directed towards such greater specificity.

Although the relationship between self-esteem and blood glucose control was examined in this study, no strong hypotheses relating these variables were posited because results from earlier studies are inconsistent. Only one previous study reports an association between poor glucose control and low self-esteem in diabetics (Anderson et al., 1981), others have failed to replicate this finding (Simonds et al. 1981; Barlow et al., 1983; & Rovet, 1987). Results from the present study also fail to demonstrate any association between self-esteem and glucose control. Although these discrepancies may in part result from differences in the self-esteem measures used, they suggest that diabetic youngsters' global self-esteem is unrelated to measures of glucose control.

#### Methodological Limitations

There are several limitations on the strength of the conclusions derived from this study. Although the predicted relationship between high stress and high disinhibition was supported in the present study, and laboratory manipulations of stress have been shown to cause dietary disinhibition (Herman et al., 1987), results from the present investigation are based solely on correlations. They do not provide sufficient evidence to assert that high levels of perceived stress cause dietary disinhibition in young diabetic women. In fact, psychological

stress and disinhibition may have bidirectional influences and trap some diabetics in a vicious cycle. Stress may influence dietary disinhibition. However, as deviating from the diabetic diet is taboo, increased stress and guilt may also result in more dietary disinhibition.

Future research could help clarify the existence of any causal associations between stress and disinhibition. Experimental studies in which psychological stress is experimentally manipulated and eating behavior is observed in diabetics would provide stronger evidence for causal associations. Alternatively, more naturalistic studies in which diabetic patients' daily eating is recorded and monitored in response to the onset of real life stressors (i.e exam period) could further clarify causal associations between stress and dietary disinhibition.

Although an important contribution to research on diabetic control, the indirect relationship between stress and blood glucose control obtained in the present study should be interpreted with caution. It does not contraindicate the existence of any direct effects between stress and blood glucose control. The indirect relationship between stress and blood glucose control obtained in the present study is limited to an association between a chronic measure of perceived stress and a long term index of metabolic control. The effects of acute stressors (i.e laboratory induced stress) on measures of short term blood glucose variations may be more conducive to demonstrating direct relationships between stress and metabolic control.

#### Treatment Implications

As dietary disinhibition is associated with poor blood glucose



control, it is tempting to adopt a simplistic view and warn diabetic disinhibitors to increase their restraint. However, according to restraint model, this advice would only exacerbate the problem and probably lead to increased disinhibition. A more effective treatment intervention might be to teach relapse prevention techniques to disinhibitors. They could be advised that occasional dietary lapses are not disastrous, and taught techniques that might help prevent disinhibition from evolving into a binge. Identifying the characteristics of diabetic young women which make them more vulnerable to dietary disinhibition could facilitate this process. In the present study, low self-esteem and high levels of perceived stress were implicated as predictors of dietary disinhibition. This knowledge could be integrated into diabetes education packages which newly diagnosed diabetics receive. Young diabetic women, especially those with low self-confidence, could be better prepared for stressful high risk situations. They could be offered more effective coping strategies such as stress management techniques which might prevent the occurrence of dietary indiscretions which are associated with poor blood glucose control.

#### Summary

Results from this study further our understanding of how psychological variables are related to dietary compliance and blood glucose control in IDDM female patients. One important finding is that diabetic young women reporting high dietary disinhibition suffer from poor blood glucose control. That is, diabetic females who often break their diet have poor blood glucose control. Moreover, perceived stress and self-

esteem were identified as psychological constructs predictive of high dietary disinhibition. These results could be used to identify IDDM patients at high risk for dietary disinhibition in order to offer them coping strategies to help prevent such dietary noncompliance. This study was the first to empirically demonstrate a model that high perceptions of life stress disrupt long term blood glucose control by indirectly interfering with dietary compliance behavior in young diabetic women.

## References

- Anderson, J., Miller, P., Auslander, W.F., & Santiago, J.V. (1981). Family characteristics of diabetic adolescents: Relationship to metabolic control. Diabetes Care, 4(6), 586-593.
- Ary, D.V., Toobert, D., Wilson, W., & Glasgow, E.R. (1986). Patient perspective on factors contributing to nonadherence to diabetic regimen. Diabetic Care, 9(2), 168-172.
- Barglow, P., Berndt, D.J., Burns, W.J., & Hatcher, R. (1986). Neuroendocrine and psychological factors in childhood diabetes mellitus. Journal of the American Academy of Child Psychiatry, 25(6), 785-793.
- Barlow, P., Edidin, D.V., Budlong-Springer, A.S., Berndt, D., Phillips, R., & Dubow, E. (1983). Diabetic control in children and adolescents: Psychological factors and therapeutic efficacy. Journal of Youth and Adolescent, 12(2), 77-94.
- Baron, R.M. & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical consideration. Journal of Personality and Social Psychology, 51(6), 1173-1182.
- Baucom, D.H. & Aiken, P.A. (1981). Effect of depressed mood on eating among obese and non-obese dieting and nondieting persons. Journal of Personality and Social Psychology, 41, 577-585.

- Bedell, J.R., Giordani, B., Amour, J.L., Tavormina, J., & Boll, T. (1977). Life stress and psychological and medical adjustment of chronically ill children. Journal of Psychosomatic Research, 21, 237-242.
- Bradley, C. (1979). Life events and the control of diabetes mellitus. Journal of Psychosomatic Research, 23, 159-162.
- Brand, A.H., Johnson, J.H., & Johnson, S.B. (1986). Life, stress, and diabetic control in children and adolescents with insulin-dependent diabetes. Journal of Pediatric Psychology, 11(4), 481-495.
- Brown, J.A. (1985). School-age children with diabetes: Knowledge and management of the disease and adequacy of self-concept. Maternal-Child-Nursing Journal, 14(1), 47-61.
- Bruch, H. (1973). Eating Disorders. Basic Books: New York.
- Cahill, G.F., Etwiler, L.D., & Freinkel, N. (1976). Editorial: Control and diabetes. New England Journal of Medicine, 294, 1004-1005.
- Chase, P. & Jackson, G.G. (1981). Stress and sugar control. The Journal of Pediatrics, 98(6), 1011-1013.
- Chiu, L. (1988). Testing the test: Measures of self-esteem for school age children. Journal of Counseling and Development, 6, 298-301.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385-396.
- Cox, D.J., Taylor, A., Nowacek, G., Holley-Wilcox, P., & Pohl, S.L. (1984). The relationship between psychological stress and insulin-dependent diabetic blood glucose control: Preliminary investigations. Health Psychology, 3(1), 63-75.

- Crandall, R. (1973). The measurement of self-esteem and related concepts. In J. Robinson and P. Shaver (Eds.), Measures of Social and Psychological Attitudes, pp.45-168. Institute for Social Research: Ann Arbor, Michigan.
- Delamater, A.M. (1986). Psychological aspects of diabetes mellitus in children. In B.B. Lakey and A.E. Lazdin (Eds.), Advances in Child Psychology, 9, 333-375.
- Delamater, A.M., Kurtz, S.M., Bubb, J., White, N., & Santiago, J.V. (1987). Stress and coping in relation to metabolic control of adolescents with type 1 diabetes. Journal of Developmental and Behavioral Pediatrics, 8(3), 136-140.
- Delbridge, L. (1975). Educational and psychological factors in the management of diabetes in childhood. Medical Journal of Australia, 2, 737-739.
- Evans, M.B. (1985). Emotional stress and diabetic control: A postulated model for the effect of emotional distress upon intermediary metabolism in the diabetic. Biofeedback and Self-Regulation, 10(3), 241-254.
- Fisher, E.B., Delamater, A.M., Bertelson, A.D., & Kirkley, B.G. (1982). Psychological factors in diabetes and its treatment. Journal of Consulting and Clinical Psychology, 50(6), 993-1003.
- Folin, O., Denis, W., & Smillie, W.G. (1914). Some observations on "emotional glycosuria" in man. Journal of Biological Chemistry, 17, 519-520.

- Frenzel, M.P., McCaul, K.D., Glasgow, R.E., & Schafer, L.C. (1988). The relationship of stress and coping to regimen adherence and glycemic control of diabetes. Journal of Social and Clinical Psychology, 6(1), 77-87.
- Garner, D.M. & Garfinkel, P.E. (1980). Socio-cultural factors in the development of anorexia nervosa. Psychological Medicine, 10, 647-656.
- Glanz, K. (1980). Compliance with dietary regimens: Its magnitude, measurement, and determinants. Preventive Medicine, 9, 787-804.
- Glasgow, R.E. & Toobert, D.J. (1988). Social environment and regimen adherence among type II diabetic patients. Diabetes Care, 11(5), 377-386.
- Goldstein, D.E., Walker, B., Rowling, S.S., Hess, R.L., England, J.D., Peth, S.B., & Hewett, J.E. (1980). Hemoglobin A1c levels in children and adolescents with diabetes mellitus. Diabetes Care, 3(4), 503-507.
- Gonen, B., Rachman, H., & Rubenstein, A.H. (1977). Hemoglobin A1C: An indicator of metabolic control of diabetic patients. Lancet, 2, 734-737.
- Grant, I. Kyle, G.C., Teichman, A., & Mendels, J. (1974). Recent life events and diabetes in adults. Psychosomatic Medicine, 36(121), 159-162.
- Gross, A.M., De'cher, H.K., Snitzer, J., Bianchi, B., & Epstein, S. (1983). Personality variables and metabolic control in children with diabetes. The Journal of Genetic Psychology, 146(1), 19-26.
- Halmi, K.A., Falk, J.R., & Schwartz, E. (1981). Binge eating and vomiting: A survey of a college population. Psychological Medicine, 11, 697-706.

- Hamburg, B.A. & Inoff, G.E. (1982). Relationship between behavioral factors and diabetic control in children and adolescents: A comparative study. Psychosomatic Medicine, 44, 321-339.
- Hanson, C.L., Henggeler, S.W., & Burghen, G.A. (1987). Model of association between psychological variables and health outcome measures of adolescents with IDDM. Diabetes Care, 10(6), 752-758.
- Hanson, S.L. & Pichert, J.W. (1986). Perceived stress and diabetes control in adolescents. Health Psychology, 5(5), 439-452.
- Hawkins, R.C. & Clement, P.F. (1980). Development and construct validation of a self-report measure of binge eating tendencies. Addictive Behaviors, 50, 219-226.
- Herman, C.P. & Mack, D. (1975). Restrained and unrestrained eating. Journal of Personality, 43, 647-660.
- Herman, C.P. & Polivy J. (1975). Anxiety, restraint, and eating behaviour. Journal of Abnormal Psychology, 84(6), 666-672.
- Herman, C.P. Polivy, J., Lank, C.N., & Heatherton, T.F. (1987). Anxiety, hunger, and eating behaviour. Journal of Abnormal Psychology, 96(1), 264-269.
- Hibscher, J.A. & Herman, C.P. (1977). Obesity, dieting, and the expression of "obese" characteristics. Journal of Comparative and Physiological Psychology, 91, 374-380.
- Hillard, J.R. & Hillard, P.J.A. (1984). Bulimia, anorexia neurosa, and diabetes: Deadly combinations. Psychiatric Clinics of North America, 7(2), 367-379.

- Hinkle, L.E. & Wolfe, S. (1952). A summary of experimental evidence relating life stress to diabetes mellitus. Journal of Mount Sinai Hospital, 19(4), 537-570.
- Holmes, T.H. & Rahe, R.H. (1967). The social adjustment scale. Journal of Psychosomatic Medicine, 11, 213-218.
- House, C.W., Pendleton, L., & Parker, L. (1986). Patients' versus physicians' attributions of reasons for diabetic patients' noncompliance with diet. Diabetes Care, 9(4), 434.
- Hudson, J.I., Wentworth, S.M., Hudson, M.S., & Pope, H.G. (1985). Prevalence of anorexia nervosa and bulimia among young diabetic women. Journal of Clinical Psychiatry, 46(3), 88-89.
- Huenemann, R.L., Shapiro, L.R., Hampton, M.C., & Mitchell, B.W. (1966). A longitudinal study of gross body composition and body conformation and their association with food and activity in a teenage population. American Journal of Clinical Nutrition, 18, 325-338.
- Isbitsky, J.R. (1987). Development and socialization of restrained eating in obese and nonobese youngsters. Unpublished doctoral dissertation, Concordia University, Montreal, Canada.
- Jacobson, A.M., Rand, L.I., & Hauser, S.T. (1985). Psychological stress and glycemic control: A comparison of patients with and without proliferative retinopathy. Psychosomatic Medicine, 47(4), 372-381.
- Jacobson, A.M., Hauser, S.T., Wolfsdorf, J.I., Houlehan, J., Milley, J.E., Herskowitz, R.D., Wertlieb, D., & Watt, E. (1987). Psychological predictors of compliance in children with recent onset diabetes mellitus. The Journal of Pediatrics, 110(5), 805-811.



- Jakobovits, C., Halstead, P., Kelley, L., Roe, D.A., & Young, C.M. (1977). Eating habits and nutrient intakes of college women over a thirty-year period. Journal of the American Dietetic Association, 71, 405-411.
- Jeske, P.J. (1985). Piers-Harris children's self-concept scale. In J.V. Mitchell, Jr. (Ed.), Ninth Mental Measurements Yearbook, 9(1), 1169-1170. Lincoln: University of Nebraska, Burors Institute of Mental Measurement.
- Jordan, H.W. & Kalich, M.D. (1971). Diabetic acidosis and emotional stress: A case report. Journal of the National Medical Association, 63, 256-258.
- Kanner, A.D., Coyne, J.C., Schaefer, C.A., & Lazarus, R.S. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. Journal of Behavioral Medicine, 4(1), 1-39.
- Katzman, M.A. & Wolchik, S.A. (1984). Bulimia and binge eating in college women: A comparison of personality and behavioral characteristics. Journal of Consulting and Clinical Psychology, 52(3), 423-428.
- Kirkley, B.G. & Fisher, E.B. (1988). Relapse as a model of nonadherence to dietary treatment of diabetes. Health Psychology, 7(3), 221-230.
- LaGreca, A.M., Schwarz, L.T., & Satin, W. (1987). Eating patterns in young women with IDDM: Another look. Diabetes Care, 10(5), 659-660.

- Leon, G. & Chamberlain, K. (1973). Emotional arousal, eating patterns, and body image as differential factors associated with varying success in maintaining weight loss. Journal of Consulting and Clinical Psychology, 40, 474-480.
- Lingswiler, V.M., Crowther, J.H., & Stephens, M.A.P. (1987). Emotional reactivity and eating in binge eating and obesity. Journal of Behavioral Medicine, 10(3), 287-299.
- Lloyd, G.G., Steel, J.M., & Young, R.J. (1987). Eating disorders and psychiatric morbidity in patients with diabetes mellitus. Psychotherapy Psychosomatics, 48, 189-195.
- Lowe, M.R. & Fisher, E.B. Jr. (1983). Emotional reactivity, emotional eating, and obesity: A naturalistic study. Journal of Behavioral Medicine, 6, 135-149.
- Mann, N.P. & Johnston, D.I. (1982). Total glycosylated haemoglobin (HbA1) level in diabetic children. Archives of Disease in Childhood, 57, 434-437.
- Marcus, M. & Wing, R.R. Binge eating and dietary restraint. Paper presented at the Annual Meeting of the Society of Behavioral Medicine, Baltimore, March, 1983.
- Marlatt, G.A. & Gordon, J.R. (1985). Relapse Prevention. Guilford: New York.
- Mazze, R.S., Lucido, D., & Shamoon, H. (1984). Psychological and social correlates of glycemic control. Diabetes Care, 7(4), 360-366.

- McCubbin, H.I., Patterson, J.M., Bauman, E., & Harris, L.H. (1985). A file: Adolescents-family inventory of life events and changes. In D.H. Olson, H.I. McCubbin, H. Barnes, A. Larsen, M. Muxen, and M. Wilson (Eds.), Family Inventories: Inventories used in a National Survey of Families Across the Family Life Cycle, (p.p. 105-119). University of Minnesota, Department of Family Social Science: St. Paul.
- McKenna, R.J. (1972). Some effects of anxiety level and food cues on the eating behavior of obese and normal weight subjects: A comparison of the schachterian and psychosomatic conceptions. Journal of Personality and Social Psychology, 22(3), 311-319.
- Nabarro, J.D.N. (1965). Diabetic acidosis: Clinical aspects. Excerpta Medical International Congress, 84, 545-557.
- Nathan, D.M., Singer, D.E., & Hurxthal, K. (1984). The clinical information value of the glycosylated hemoglobin assay. New England Journal of Medicine, 310, 341-346.
- National Commission on Diabetes Report (1975). DHEW Publication number (NIH)77-018. United States Government, Printing Office.
- Piers, E.V. & Harris, D.B. (1969). The Piers-Harris Children's Self-Concept Scale. Counselor Recordings and Tests: Nashville, T.N.
- Polivy, J., Heatherton, T.F., & Herman, C.P. (1988). Self-esteem, restraint, and eating behavior. Unpublished manuscript.
- Polivy, J. & Herman, C.P. (1987). Diagnosis and treatment of normal eating. Journal of Consulting and Clinical Psychology, 55(5), 1-10.

- Polivy, J. & Herman, C.P. (1976). The effects of alcohol on eating behavior: Disinhibition or sedation? Addictive Behaviors, 1, 121-125.
- Rodin, G.M., Craven, J., Littlefield, C., & Daneman, D. (1989). Eating disorders and insulin manipulations in adolescent females with IDDM. Psychosomatic Medicine, 51, 244-266.
- Rodin, G.M., Daneman, D., Johnson, L.E., Kenshole, A., & Garfinkel, P. (1985). Anorexia nervosa and bulimia in female adolescents with insulin dependent diabetes mellitus: A systematic study. Journal of Psychiatry Research, 19(2/3), 381-384.
- Rodin, G.M., Johnson, L.E., Garfinkel, P.E., Daneman, D., & Kenshole, A.B. (1986-87). Eating disorders in female adolescents with insulin dependent diabetes mellitus. International Journal of Psychiatry in Medicine, 16(1), 49-57.
- Rosemark, B., Berne, C., Holmgren, S., Lago, C., Renholm, G., & Sohlberg, S. (1986). Eating disorders in patients with insulin-dependent diabetes mellitus. Journal of Clinical Psychiatry, 47, 547-550.
- Rovet, J., Ehrlich, R., & Hoppe, M. (1987). Behavior problems in children with diabetes as a function of sex and age of onset of disease. Journal of Child Psychology and Psychiatry, 28(3), 477-491.
- Ruderman, A.J. (1985). Dysphoric mood and over eating: A test of restraint theory's disinhibition hypothesis. Journal of Abnormal Psychology, 94, 78-85.
- Ruderman, A.J. (1986). Dietary restraint: A theoretical and empirical review. Psychological Bulletin, 99(2), 247-262.

- Ruggiero, L., Spirito, A., Bond, A., Coustan, D., & McGarvey, S. (1990). Impact of social support and stress on compliance in women with gestational diabetes. Diabetes Care, 13(4), 441-443.
- Ryan, C.M. & Morrow, L.A. (1986). Self-esteem in diabetic adolescents: Relationship between age at onset and gender. Journal of Consulting and Clinical Psychology, 54(5), 730-731.
- Ryan, C., Vega, A., & Drash, A. (1985). Cognitive deficits in adolescents who developed diabetes early in life. Pediatrics, 75, 921-927.
- Sarason, I.G. (1979). Assessing the impact of life changes: Development of the life experiences survey. In I. Sarason, C. and Spielberger (Eds.), Stress and Anxiety. Halstead, New York.
- Schafer, L.C., Glasgow, R.E., McCaul, K.D., & Dreher, M. (1983). Adherence to IDDM regimens: Relationship to psychological variables and metabolic control. Diabetes Care, 6, 493-498.
- Simonds, J., Goldstein, D., Walker, B., & Rawlings, S. (1981). The relationship between psychological factors and blood glucose regulation in insulin dependent diabetic adolescents. Diabetes Care, 4, 610-615.
- Siperstein, M.D., Foster, D.W., Knowles, H.C., Levine, R., Madison, L., & Roth, J. (1975). Control of blood glucose and diabetic vascular disease. New England Journal of Medicine, 296, 1060-1063.
- Skyler, J.S. (1981). Psychological issues in diabetes. Diabetes Care, 4, 656-657.
- Slochower, J. & Kaplan, S.P. (1980). Anxiety, perceived control, and eating in obese and normal weight persons. Appetite, 1, 75-83.

- Slochower, J., Kaplan, S.P., & Mann, L. (1981). The effects of life stress and weight on mood and eating. Appetite, 2, 115-125.
- Steel, J.M., Young, R.J., Lloyd, G.G., & Clarke, B.F. (1987). Clinically apparent eating disorders in young diabetic women: Associations with painful neuropathy and other complications. British Medical Journal, 294(4), 859-862.
- Stunkard, A.J. & Messick, S. (1985). The three factor eating questionnaire to measure dietary restraint, disinhibition, and hunger. Journal of Psychosomatic Research, 29, 71-83.
- Sullivan, B. (1978). Self-esteem and depression in adolescent diabetic girls. Diabetes Care, 1(1), 18-22.
- Szmukler, G.I. (1984). Anorexia nervosa and bulimia in diabetics. Journal of Psychosomatic Research, 28(5), 365-369.
- Szmukler, G.I. & Russell, G.F. (1983). Diabetes mellitus, anorexia nervosa, and bulimia. British Journal of Psychiatry, 142, 305-308.
- Tabachnick, B.G. & Fidell, S.L. (1983). Using Multivariate Statistics. Harper and Row: New York.
- Tarnow, J.D. & Silverman, S.W. (1981-82). The psychophysiologic aspects of stress in juvenile diabetes mellitus. International Journal of Psychiatry in Medicine, 11(1), 25-44.
- Tavormina, J.B., Kastner, L.S., Slater, P.M., & Watt, S.L. (1976). Chronically-ill children: A psychologically and emotionally deviant population. Journal of Abnormal Child Psychology, 4, 99-110.
- Turk, D.C. & Speers, M.A. (1983). Diabetes mellitus: A cognitive-functional analysis of stress. In B. Bradley (Ed.), Coping with Chronic Disease, (pp.191-217). Academic Press: New York.

- Wardle, J. & Beales, S. (1988). Control and loss of control over eating: An experimental investigation. Journal of Abnormal Psychology, 97(1), 35-40.
- Weissenburg, J., Rush, A.J., Giles, D.E., & Stunkard, A.J. Weight changes in depression. (Submitted for publication.)
- White, C.A. (1973). The effects of viewing films of different arousal content on the eating behavior of obese and normal weight subjects. Unpublished doctoral dissertation, University of Miami.
- Willis, T. (1684). Practice of physick: Treastise II. In Dring, Mayer, and Leight (Eds.), Pharmaceutice Rationalis, pp.74, London.
- Wing, R.R., Nowalk, M.P., Marcus, M.D., Koeske, R., & Finegold, D. (1986). Subclinical eating disorders and glycemc control in adolescents with type I diabetes. Diabetes Care, 9(2), 162-167.
- Woody, E.Z. & Costanzo, P.R. (1981). The socialization of obesity-prone behavior. In S. Brehm, S. Kassen, and F.X. Gibbons (Eds.), Developmental Social Psychology: Theory and Research. New York: Oxford University Press.
- Wolf, T., Hunter, S., & Webber, L. (1979). Psychological measures and cardiovascular risk factors in children and adolescents. Journal of Psychology, 101, 139-146.
- Wolf, T., Hunter, S., Webber, L., & Berenson, G. (1981). Self-concept, locus of control, goal blockage, and coronary prone behaviour pattern in children and adolescent: Bogalusa heart study. Journal of General Psychology, 105, 13-25.
- Wylie, R.C. (1974). The self-concept (Volume 1). University of Nebraska Press: Lincoln.

Appendix A  
T-tests Comparing for Language Differences



Appendix A

T-tests comparing for language differences.

Variable	English mean (n = 39)	French mean ( n = 26)	T-value	Significance
Age	16.9	16.3	.88	p < .38
Duration of IDDM	7.4	6.2	.54	p < .29
HbA1c	7.7	7.2	1.11	p < .27
Self-esteem	66	61	.83	p < .41
Perceived Stress	7.6	9.3	.94	p < .35
Restraint	11.6	11.9	-.25	p < .80
Disinhibition	5.7	6.5	.91	p < .37
Hunger	4.9	5.7	1.82	p < .24

Appendix B  
Consent Form

# The Montreal Children's Hospital

A MCGILL UNIVERSITY TEACHING HOSPITAL



## Consent Form

Project Title: The effects of emotions and eating behaviour on diabetic control.

Donna White, Ph.D.  
Psychologist, MCH

Louise Balfour  
Psychology Student, Concordia

Dear Patient and Parent,

You are invited to participate in a study which looks at how stress, feelings about oneself (self-esteem), and eating habits are related to diabetic control.

We are asking patients attending the diabetic clinic at the Montreal Children's Hospital to help in this research project by completing three questionnaires. The information from these questionnaires will be analyzed in relation to patients' blood test results. You will be able to complete the questionnaires which take approximately 30 minutes during your regular clinic visit. We will use the information from your regular blood test so that another test or hospital visit are not necessary.

All information obtained from this study will be kept strictly confidential and no hospital staff (doctors or nurses) will have access to questionnaire information from individual clients.

Participation in this study is voluntary and participants are free to withdraw at any time; however, most people find the questionnaires interesting and the results from this project will hopefully give us useful information concerning how to help diabetic adolescents achieve better blood glucose control.

If you have any questions at all about the study, please do not hesitate to call either Louise Balfour, 848-2256, or Dr. Donna White, the project director, 848-7542.

Clients' Consent

I have read the description of the project and I understand its goals and methods. I agree to fill out the questionnaires and give you access to my blood glucose measures.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Witness: \_\_\_\_\_

Parental Consent

I have read the description of the project and I understand its goals and methods.

I agree that my child \_\_\_\_\_ (child's name) may participate in the study.

Parent's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Witness: \_\_\_\_\_

If you would like a copy of any published results from this study, please print your name here and indicate your address.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Thank you very much for your cooperation

Donna White, Ph.D.  
 Psychologist, MCH

Louise Balfour  
 Psychology Student, Concordia

Appendix C  
The Perceived Stress Scale

Identification # \_\_\_\_\_

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the past two months. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

- 0. Never
- 1. Almost never
- 2. sometimes
- 3. fairly often
- 4. very often

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. In the last two months, how often have you been upset because of something that happened unexpectedly?                                   | 0 | 1 | 2 | 3 | 4 |
| 2. In the last two months, how often have you felt that you were unable to control the important things in your life?                       | 0 | 1 | 2 | 3 | 4 |
| 3. In the last two months, how often have you felt nervous and "stressed" ?   | 0 | 1 | 2 | 3 | 4 |
| 4. In the last two months, how often have you dealt successfully with irritating life hassles?  | 0 | 1 | 2 | 3 | 4 |
| 5. In the last two months, how often have you felt that you were effectively coping with important changes that were going on in your life? | 0 | 1 | 2 | 3 | 4 |

0. Never
1. Almost Never
2. Sometimes
3. Fairly Often
4. Very Often

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 6. In the last two months, how often have you felt confident about your ability to handle your personal problems?              | 0 | 1 | 2 | 3 | 4 |
| 7. In the last two months, how often have you felt confident that things were going your way?                                  | 0 | 1 | 2 | 3 | 4 |
| 8. In the last two months, how often have you felt that you could not cope with all the things that you had to do?             | 0 | 1 | 2 | 3 | 4 |
| 9. In the last two months, how often have you been able to control irritations in your life?                                   | 0 | 1 | 2 | 3 | 4 |
| 10. In the last two months, how often have you felt on top of things?  | 0 | 1 | 2 | 3 | 4 |
| 11. In the last two months, how often have you been angered because of things that happened that were outside of your control? | 0 | 1 | 2 | 3 | 4 |
| 12. In the last two months, how often have you found yourself thinking about things that had to be accomplished?               | 0 | 1 | 2 | 3 | 4 |
| 13. In the last two months, how often have you been able to control the way you spend your time?                               | 0 | 1 | 2 | 3 | 4 |
| 14. In the last two months, how often have you felt difficulties were piling up so high that you could not overcome them?      | 0 | 1 | 2 | 3 | 4 |

Appendix D  
The Three Factor Eating Questionnaire



EATING HABITS QUESTIONNAIRE

## Part 1

Please answer each of the following questions by circling true or false ( T or F ).

- |     |   |   |   |
|-----|---|---|---|
| 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 eating a meal.     | T | F |
| 2.  | I usually eat too much a social occasions, like parties and picnics.  | T | F |
| 3.  | I am usually so hungry that I eat more than three times per 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 conscious means of limiting the amount that I eat.              | T | F |
| 24. | I get so hungry that my stomach often feels 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 can 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 at 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 |

## Part II

Directions: 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 unlikely	moderately likely	very likely

47. How often 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 unlikely	moderately likely	very likely

49. Do you go on eating 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 whatever you want, 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 into, but often "give in"
4
usually limit food intake, rarely "give in"
5
constantly limit 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	2	3	4
not like me	little like me	pretty good description	describes me perfectly

Appendix E  
The Piers-Harris Self-Concept Scale

# "THE WAY I FEEL ABOUT MYSELF"

## The Piers-Harris Children's Self-Concept Scale

Ellen V. Piers, Ph.D. and Dale B. Harris, Ph.D.

Published by

**wps** WESTERN PSYCHOLOGICAL SERVICES  
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 12031 Westmore Boulevard  
 Los Angeles, California 90025

**Directions:** Here are a set of statements that tell how some people feel about themselves. Read each statement and decide whether or not it describes the way you feel about yourself. If it is *true or mostly true* for you, circle the word "yes" next to the statement. If it is *false or mostly false* for you, circle the word "no." Answer every question, even if some are hard to decide. Do not circle both "yes" and "no" for the same statement.

Remember that there are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

TOTAL SCORE: Raw Score \_\_\_\_\_ Percentile \_\_\_\_\_ Stanine \_\_\_\_\_

CLUSTERS: I \_\_\_\_\_ II \_\_\_\_\_ III \_\_\_\_\_ IV \_\_\_\_\_ V \_\_\_\_\_ VI \_\_\_\_\_

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- |  |     |    |  |     |    |
|--|-----|----|--|-----|----|
| 1. My classmates make fun of me .....                      | yes | no | 21. I am good in my school work .....                    | yes | no |
| 2. I am a happy person .....                               | yes | no | 22. I do many bad things .....                           | yes | no |
| 3. It is hard for me to make friends .....                 | yes | no | 23. I can draw well .....                                | yes | no |
| 4. I am often sad .....                                    | yes | no | 24. I am good in music .....                             | yes | no |
| 5. I am smart .....  | yes | no | 25. I behave badly at home .....                         | yes | no |
| 6. I am shy .....  | yes | no | 26. I am slow in finishing my school work .....          | yes | no |
| 7. I get nervous when the teacher calls on me .....        | yes | no | 27. I am an important member of my class .....           | yes | no |
| 8. My looks bother me .....                                | yes | no | 28. I am nervous .....                                   | yes | no |
| 9. When I grow up, I will be an important person .....     | yes | no | 29. I have pretty eyes .....                             | yes | no |
| 10. I get worried when we have tests in school .....       | yes | no | 30. I can give a good report in front of the class ..... | yes | no |
| 11. I am unpopular .....                                   | yes | no | 31. In school I am a dreamer .....                       | yes | no |
| 12. I am well behaved in school .....                      | yes | no | 32. I pick on my brother(s) and sister(s) .....          | yes | no |
| 13. It is usually my fault when something goes wrong ..... | yes | no | 33. My friends like my ideas .....                       | yes | no |
| 14. I cause trouble to my family .....                     | yes | no | 34. I often get into trouble .....                       | yes | no |
| 15. I am strong .....                                      | yes | no | 35. I am obedient at home .....                          | yes | no |
| 16. I have good ideas .....                                | yes | no | 36. I am lucky .....                                     | yes | no |
| 17. I am an important member of my family .....            | yes | no | 37. I worry a lot .....                                  | yes | no |
| 18. I usually want my own way .....                        | yes | no | 38. My parents expect too much of me .....               | yes | no |
| 19. I am good at making things with my hands .....         | yes | no | 39. I like being the way I am .....                      | yes | no |
| 20. I give up easily .....                                 | yes | no | 40. I feel left out of things .....                      | yes | no |

- |   |     |    |  |     |    |
|---|-----|----|--|-----|----|
| 41. I have nice hair .....                                | yes | no | 61. When I try to make something, everything seems to go wrong ..... | yes | no |
| 42. I often volunteer in school .....                     | yes | no | 62. I am picked on at home .....                                     | yes | no |
| 43. I wish I were different .....                         | yes | no | 63. I am a leader in games and sports .....                          | yes | no |
| 44. I sleep well at night .....                           | yes | no | 64. I am clumsy .....  | yes | no |
| 45. I hate school .....                                   | yes | no | 65. In games and sports, I watch instead of play .....               | yes | no |
| 46. I am among the last to be chosen for games .....      | yes | no | 66. I forget what I learn .....                                      | yes | no |
| 47. I am sick a lot .....                                 | yes | no | 67. I am easy to get along with .....                                | yes | no |
| 48. I am often mean to other people .....                 | yes | no | 68. I lose my temper easily .....                                    | yes | no |
| 49. My classmates in school think I have good ideas ..... | yes | no | 69. I am popular with girls .....                                    | yes | no |
| 50. I am unhappy .....                                    | yes | no | 70. I am a good reader .....   | yes | no |
| 51. I have many friends .....                             | yes | no | 71. I would rather work alone than with a group .....                | yes | no |
| 52. I am cheerful .....                                   | yes | no | 72. I like my brother (sister) .....                                 | yes | no |
| 53. I am dumb about most things .....                     | yes | no | 73. I have a good figure .....                                       | yes | no |
| 54. I am good-looking .....                               | yes | no | 74. I am often afraid .....  | yes | no |
| 55. I have lots of pep .....                              | yes | no | 75. I am always dropping or breaking things .....                    | yes | no |
| 56. I get into a lot of fights .....                      | yes | no | 76. I can be trusted .....   | yes | no |
| 57. I am popular with boys .....                          | yes | no | 77. I am different from other people .....                           | yes | no |
| 58. People pick on me .....                               | yes | no | 78. I think bad thoughts .....                                       | yes | no |
| 59. My family is disappointed in me .....                 | yes | no | 79. I cry easily .....   | yes | no |
| 60. I have a pleasant face .....                          | yes | no | 80. I am a good person .....   | yes | no |



Appendix F  
French Questionnaires

# The Montreal Children's Hospital

A MCGILL UNIVERSITY TEACHING HOSPITAL



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## Formulaire de consentement

Titre du projet: L'effet des émotions et du comportement  
alimentaire sur le contrôle du diabète

Donna White, Ph.D. Psychologue, Hôpital de Montréal pour enfants	Louise Balfour Étudiante en psychologie, Université Concordia
--	---

Cher (chère) patient(e), cher parent,

Vous êtes invité(e) à participer à une recherche qui porte sur la façon dont le stress, les sentiments envers soi-même et les habitudes alimentaires peuvent influencer le contrôle du diabète.

Nous demandons aux patient(e)s qui fréquentent la clinique des diabétiques de l'Hôpital de Montréal pour enfants d'aider cette recherche en remplissant trois questionnaires. L'information contenue dans ces questionnaires sera analysée en relation avec les résultats des tests sanguins des patient(e)s. Vous pourrez compléter les questionnaires dans environ 30 minutes lors d'une de vos visites régulières à la clinique. De plus, nous utiliserons les résultats des tests sanguins que vous passerez à la clinique; vous n'aurez donc pas besoin de passer un test de sang supplémentaire ou d'une visite additionnelle à l'hôpital.

Toutes les informations obtenues par cette recherche seront tenues dans la plus stricte confidentialité. Aucun employé de l'hôpital (infirmier(ère), médecin) n'aura accès aux informations ressortant des questionnaires.

La participation à cette recherche est entièrement volontaire et les participants sont libres d'abandonner en tout temps. Cependant, la plupart des gens trouvent ces questionnaires intéressants et les résultats nous permettront, nous l'espérons, de recueillir de précieuses informations sur la façon dont nous pouvons aider les

Directives:

Voici une série d'énoncés qui expriment la façon dont les gens pensent face à eux-mêmes. Lis chaque phrase et décide si elle décrit ou non la façon dont tu te sens par rapport à toi-même. Si c'est vrai ou pas mal vrai, encercle le mot "OUI". Si c'est faux ou pas mal faux, encercle le "NON". Réponds à chaque question, même si tu as de la difficulté à répondre à certaines. N'encercle pas les deux réponses pour la même phrase.

Rappelle-toi qu'il n'y a pas de bonne ni de mauvaise réponse ici. Il n'y a que toi qui puisse nous dire comment tu te sens face à toi-même. Nous espérons donc que tu indiqueras la façon dont tu te sens vraiment en dedans de toi.

- |     |     |     |  |
|-----|-----|-----|--|
| OUI | NON | 1.  | Mes camarades de classe se moquent de moi.                     |
| OUI | NON | 2.  | Je suis une personne heureuse.                                 |
| OUI | NON | 3.  | J'ai de la difficulté à me faire des amis.                     |
| OUI | NON | 4.  | Je suis souvent triste.  |
| OUI | NON | 5.  | Je suis intelligent(e) et débrouillard(e).                     |
| OUI | NON | 6.  | Je suis gêné(e).   |
| OUI | NON | 7.  | Je suis nerveux(se) quand le professeur m'interroge en classe. |
| OUI | NON | 8.  | Mon apparence me dérange.                                      |
| OUI | NON | 9.  | Quand je serai grand(e), je serai une personne importante.     |
| OUI | NON | 10. | Je suis inquiet(e) lorsque j'ai un test à passer à l'école.    |
| OUI | NON | 11. | Je suis mal vu(e) par les autres.                              |
| OUI | NON | 12. | J'ai un bon comportement à l'école.                            |
| OUI | NON | 13. | C'est habituellement de ma faute quand ça va mal.              |
| OUI | NON | 14. | Je cause des ennuis à ma famille.                              |
| OUI | NON | 15. | Je suis fort(e).   |

- |     |     |   |
|-----|-----|---|
| OUI | NON | 16. J'ai de bonnes idées.                                   |
| OUI | NON | 17. Je suis un membre important dans ma famille.            |
| OUI | NON | 18. Je fais habituellement à ma tête.                       |
| OUI | NON | 19. Je suis habile pour faire quelque chose de mes mains.   |
| OUI | NON | 20. J'abandonne facilement.                                 |
| OUI | NON | 21. Je suis bon(ne) dans mes travaux à l'école.             |
| OUI | NON | 22. Je fais beaucoup de choses qui ne sont pas correctes.   |
| OUI | NON | 23. Je suis bon(ne) en dessin.                              |
| OUI | NON | 24. Je suis bon(ne) en musique.                             |
| OUI | NON | 25. Je n'ai pas un bon comportement à la maison.            |
| OUI | NON | 26. Ça me prend du temps à terminer mes devoirs.            |
| OUI | NON | 27. Je suis un membre important dans ma classe.             |
| OUI | NON | 28. Je suis nerveux(se).                                    |
| OUI | NON | 29. J'ai de beaux yeux.                                     |
| OUI | NON | 30. Je peux présenter un bon rapport devant la classe.      |
| OUI | NON | 31. Je suis souvent dans la lune à l'école.                 |
| OUI | NON | 32. J'agace mes frères et mes soeurs (mon frère, ma soeur). |
| OUI | NON | 33. Mes amis aiment mes idées.                              |
| OUI | NON | 34. Je suis souvent dans le trouble.                        |
| OUI | NON | 35. Je suis obéissant(e) à la maison.                       |
| OUI | NON | 36. Je suis chanceux(se).                                   |
| OUI | NON | 37. Je m'inquiète beaucoup.                                 |
| OUI | NON | 38. Mes parents en attendent trop de moi.                   |
| OUI | NON | 39. J'aime être comme je suis.                              |
| OUI | NON | 40. Je me sens mis(e) de côté.                              |
| OUI | NON | 41. J'ai de beaux cheveux.                                  |

- OUI NON 42. Je me porte souvent volontaire à l'école.
- OUI NON 43. J'aimerais être différent(e).
- OUI NON 44. Je dors bien la nuit.
- OUI NON 45. Je déteste l'école.
- OUI NON 46. Je suis parmi les dernier(e)s choisi(e)s pour jouer.
- OUI NON 47. Je suis souvent malade.
- OUI NON 48. Je suis souvent méchant(e) envers les gens.
- OUI NON 49. Mes camarades de classe pensent que j'ai de bonnes idées.
- OUI NON 50. Je suis malheureux(se).
- OUI NON 51. J'ai beaucoup d'ami(e)s.
- OUI NON 52. Je suis joyeux(se).
- OUI NON 53. Je ne suis pas bon(ne) dans beaucoup de choses.
- OUI NON 54. Je suis beau (belle).
- OUI NON 55. J'ai beaucoup d'entrain.
- OUI NON 56. Je me hataille souvent.
- OUI NON 57. Je suis populaire auprès des garçons.
- OUI NON 58. Les gens m'agacent beaucoup.
- OUI NON 59. Ma famille est déçue de moi.
- OUI NON 60. J'ai un joli visage.
- OUI NON 61. Quand j'essaie de faire quelque chose, tout semble aller de travers.
- OUI NON 62. On m'agace souvent à la maison.
- OUI NON 63. Je suis un(e) meneur(euse) dans les jeux et les sports.
- OUI NON 64. Je suis maladroit(e).
- OUI NON 65. Dans les jeux ou les sports, je regarde au lieu de jouer.
- OUI NON 66. J'oublie ce que j'apprends.

- |     |     |   |
|-----|-----|---|
| OUI | NON | 67. C'est facile de bien s'entendre avec moi.     |
| OUI | NON | 68. Je me choque facilement.                      |
| OUI | NON | 69. Je suis populaire auprès des filles.          |
| OUI | NON | 70. Je suis bon(ne) en lecture.                   |
| OUI | NON | 71. J'aime mieux travailler seul(e) qu'en groupe. |
| OUI | NON | 72. J'aime mon frère (ma soeur).                  |
| OUI | NON | 73. Je suis physiquement bien proportionné(e).    |
| OUI | NON | 74. J'ai souvent peur.                            |
| OUI | NON | 75. J'échappe ou je brise souvent des choses.     |
| OUI | NON | 76. On peut me faire confiance.                   |
| OUI | NON | 77. Je suis différent(e) des autres.              |
| OUI | NON | 78. J'ai de mauvaises pensées.                    |
| OUI | NON | 79. Je pleure facilement.                         |
| OUI | NON | 80. Je suis une bonne personne.                   |

No d'identification \_\_\_\_\_

Ce questionnaire concerne les émotions et les sentiments que vous avez ressentis au cours des deux (2) derniers mois. Pour chaque question, nous vous demandons d'indiquer jusqu'à quel point vous vous êtes senti(e) [ou vous avez pensé] d'une certaine manière. Même si certaines questions se ressemblent, elles sont différentes et vous devez les traiter indépendamment les unes des autres. L'approche recommandée est de répondre à chaque question assez rapidement. C'est-à-dire, n'essayez pas de compter le nombre de fois où vous vous êtes senti(e) d'une certaine manière. Choisissez plutôt la réponse qui vous semble la plus appropriée parmi le choix qui suit:

0.	Jamais
1.	Presque jamais
2.	Quelquefois
3.	Assez souvent
4.	Très souvent

- |    |   |   |   |   |   |   |
|----|---|---|---|---|---|---|
| 1. | Au cours des deux derniers mois, à quel point avez-vous été troublé(e) par quelque chose qui vous est arrivé soudainement?                                  | 0 | 1 | 2 | 3 | 4 |
| 2. | Au cours des deux derniers mois, à quel point avez-vous senti que vous étiez incapable de contrôler les aspects importants de votre vie?                    | 0 | 1 | 2 | 3 | 4 |
| 3. | Au cours des deux derniers mois, à quel point vous êtes-vous senti(e) nerveux(se) et stressé(e)?  | 0 | 1 | 2 | 3 | 4 |
| 4. | Au cours des deux derniers mois, à quel point avez-vous surmonté avec succès vos petits problèmes de chaque jour?   | 0 | 1 | 2 | 3 | 4 |
| 5. | Au cours des deux derniers mois, à quel point avez-vous senti que vous vous étiez bien tiré(e) des changements importants qui sont survenus dans votre vie? | 0 | 1 | 2 | 3 | 4 |
| 6. | Au cours des deux derniers mois, à quel point aviez-vous confiance en vos aptitudes à régler vos problèmes personnels?                                      | 0 | 1 | 2 | 3 | 4 |
| 7. | Au cours des deux derniers mois, à quel point aviez-vous confiance que tout allait comme vous le vouliez?   | 0 | 1 | 2 | 3 | 4 |

- |     |  |   |   |   |   |   |
|-----|--|---|---|---|---|---|
| 8.  | Au cours des deux derniers mois, à quel point avez-vous senti que vous n'étiez pas capable de venir à bout de toutes les choses que vous deviez faire? | 0 | 1 | 2 | 3 | 4 |
| 9.  | Au cours des deux derniers mois, à quel point avez-vous été capable de contrôler les contrariétés qui se sont produites?                               | 0 | 1 | 2 | 3 | 4 |
| 10. | Au cours des deux derniers mois, à quel point avez-vous senti que vous contrôliez tous les éléments de votre vie?                                      | 0 | 1 | 2 | 3 | 4 |
| 11. | Au cours des deux derniers mois, à quel point avez-vous été en colère à cause d'événements qui étaient en dehors de votre contrôle?                    | 0 | 1 | 2 | 3 | 4 |
| 12. | Au cours des deux derniers mois, à quel point avez-vous pensé aux choses qui devaient être accomplies?   | 0 | 1 | 2 | 3 | 4 |
| 13. | Au cours des deux derniers mois, à quel point avez-vous été capable de contrôler l'utilisation de votre temps?   | 0 | 1 | 2 | 3 | 4 |
| 14. | Au cours des deux derniers mois, à quel point avez-vous senti que vous aviez tellement de problèmes que vous ne pouviez pas les surmonter?             | 0 | 1 | 2 | 3 | 4 |



Questionnaire sur les habitudes alimentaires

Première partie

Veillez répondre à chaque question en encerclant VRAI ou FAUX.

- |     |   |      |      |
|-----|---|------|------|
| 1.  | Quand je sens l'odeur d'un steak qui grille ou quand je vois un morceau de viande juteux, je trouve très difficile de ne pas manger, même si je viens juste de terminer un repas. | VRAI | FAUX |
| 2.  | Je mange habituellement trop lorsque je suis en société, comme dans un party ou un pique-nique.   | VRAI | FAUX |
| 3.  | Habituellement, j'ai tellement faim que je mange plus de trois fois par jour.   | VRAI | FAUX |
| 4.  | Quand j'ai mangé mon quota en calories, je suis habituellement assez raisonnable pour ne plus manger.   | VRAI | FAUX |
| 5.  | Il m'est extrêmement difficile de suivre une diète parce qu'il vient un temps où j'ai trop faim.  | VRAI | FAUX |
| 6.  | Je prends délibérément de petites portions pour m'aider à contrôler mon poids.  | VRAI | FAUX |
| 7.  | Il y a des fois où tout goûte tellement bon que je continue à manger même si je n'ai plus faim.   | VRAI | FAUX |
| 8.  | Comme j'ai souvent faim, j'aimerais qu'il y ait un expert pendant que je mange pour me dire si j'en ai eu assez ou si je peux en avoir davantage.                                 | VRAI | FAUX |
| 9.  | Je me surprends souvent à manger lorsque je suis anxieux(se).   | VRAI | FAUX |
| 10. | La vie est trop courte pour se préoccuper de suivre une diète.  | VRAI | FAUX |
| 11. | Comme mon poids monte et descend, j'ai été à la diète plus d'une fois.  | VRAI | FAUX |
| 12. | Souvent, j'ai tellement faim que je dois absolument manger quelque chose.   | VRAI | FAUX |
| 13. | Quand je suis avec quelqu'un qui mange trop, je mange habituellement trop moi aussi.  | VRAI | FAUX |
| 14. | J'ai une assez bonne idée du nombre de calories dans les aliments courants.   | VRAI | FAUX |
| 15. | Il y a des fois où je commence à manger et il me semble impossible d'arrêter.   | VRAI | FAUX |

16. Ce n'est pas difficile pour moi de laisser quelque chose dans mon assiette. VRAI FAUX
17. J'ai faim à certaines heures de la journée parce que je suis habitué(e) à manger à ces heures-là. VRAI FAUX
18. Quand je suis à la diète et que je mange quelque chose de défendu, je mange ensuite délibérément moins pendant un certain temps pour me rattraper. VRAI FAUX
19. Etre avec quelqu'un qui mange me donne assez faim pour manger également. VRAI FAUX
20. J'ai tendance à trop manger lorsque je me sens triste. VRAI FAUX
21. J'aime trop manger pour gâcher mon plaisir en comptant mes calories ou en surveillant mon poids. VRAI FAUX
22. Quand je vois un mets particulièrement alléchant, j'ai souvent tellement faim que je dois manger tout de suite. VRAI FAUX
23. J'arrête souvent de manger avant d'être rassasié(e) comme moyen conscient de limiter la quantité que je mange. VRAI FAUX
24. J'en viens à avoir tellement faim que mon estomac me semble un trou sans fond. VRAI FAUX
25. Mon poids a très peu changé au cours des dix dernières années. VRAI FAUX
26. J'ai toujours faim et je trouve donc difficile d'arrêter de manger avant d'avoir terminé mon assiette. VRAI FAUX
27. Quand je me sens seul(e), je me console en mangeant. VRAI FAUX
28. Je me retiens souvent aux repas afin de ne pas prendre de poids. VRAI FAUX
29. J'ai parfois très faim en fin de soirée ou pendant la nuit. VRAI FAUX
30. Je mange ce que je veux, quand je veux. VRAI FAUX
31. Même sans y penser, je prends beaucoup de temps pour manger. VRAI FAUX
32. Je compte mes calories pour m'aider à contrôler mon poids. VRAI FAUX

33. Je ne mange pas certains aliments parce qu'ils me font engraisser. VRAI FAUX
34. J'ai toujours assez faim pour manger, quelque soit l'heure. VRAI FAUX
35. Je surveille de très près les changements dans ma ligne. VRAI FAUX
36. Si je suis une diète et que je mange un aliment défendu, il m'arrive alors souvent de me bourrer d'autres aliments riches en calories. VRAI FAUX

### Deuxième partie

Veuillez répondre aux questions suivantes en encerclant le chiffre qui correspond à la meilleure réponse pour vous.

37. Combien de fois vous efforcez-vous consciemment de suivre une diète pour contrôler votre poids?
- |          |         |                |          |
|----------|---------|----------------|----------|
| 1        | 2       | 3              | 4        |
| rarement | parfois | habituellement | toujours |
38. Est-ce qu'une variation de 5 lbs affecterait la façon dont vous vivez votre vie?
- |             |            |            |          |
|-------------|------------|------------|----------|
| 1           | 2          | 3          | 4        |
| pas du tout | légèrement | modérément | beaucoup |
39. A quelle fréquence ressentez-vous la faim?
- |                               |                         |                         |                       |
|-------------------------------|-------------------------|-------------------------|-----------------------|
| 1                             | 2                       | 3                       | 4                     |
| à l'heure des repas seulement | parfois entre les repas | souvent entre les repas | presque tout le temps |
40. Est-ce que le sentiment de culpabilité d'avoir trop mangé vous aide à contrôler votre consommation de nourriture?
- |        |          |         |          |
|--------|----------|---------|----------|
| 1      | 2        | 3       | 4        |
| jamais | rarement | souvent | toujours |

41. A quel point vous serait-il difficile d'arrêter de manger au milieu du souper et de ne pas manger pendant les quatre heures qui suivent?

1	2	3	4
facile	légèrement difficile	modérément difficile	très difficile

42. A quel point êtes-vous conscient(e) de ce que vous mangez?

1	2	3	4
pas du tout	légèrement	modérément	extrêmement

43. A quelle fréquence évitez-vous d'emmagasiner des aliments tentants?

1	2	3	4
presque jamais	rarement	habituellement	presque toujours

44. Quelles sont les chances que vous fassiez vos emplettes en cherchant des aliments à faible teneur en calories?

1	2	3	4
aucune chance	peu probable	modérément probable	beaucoup de chances

45. Est-ce que vous mangez raisonnablement en compagnie d'autres personnes et par contre vous vous gavez lorsque vous êtes seul(e)?

1	2	3	4
jamais	rarement	souvent	toujours

46. Quelles sont les chances que vous mangiez délibérément plus lentement afin de couper sur la quantité que vous absorbez?

1	2	3	4
aucune chance	peu probable	modérément probable	beaucoup de chances

47. A quelle fréquence sautez-vous le dessert parce que vous n'avez plus faim?

1	2	3	4
presque jamais	rarement	au moins une fois par semaine	presque tous les jours

48. Quelles sont les chances que vous mangiez délibérément moins que vous le vouliez?

1	2	3	4
aucune chance	peu probable	modérément probable	beaucoup de chances

49. Vous arrive-t-il de vous gaver de nourriture même lorsque vous n'avez pas faim?

1	2	3	4
jamais	rarement	parfois	au moins une fois par semaine

50. En vous basant sur une échelle de 0 à 5, où le 0 signifie que vous n'avez aucune restriction alimentaire (vous mangez ce que vous voulez, quand vous le voulez) et où le 5 signifie une restriction totale (vous devez tout le temps limiter votre consommation de nourriture et ne jamais "ceder à la tentation"), quel chiffre vous décrirait le mieux?

- 0 Je mange ce que je veux, quand je le veux.
- 1 Je mange habituellement ce que je veux, quand je le veux.
- 2 Je mange assez souvent ce que je veux, quand je le veux.
- 3 Je limite souvent ma consommation de nourriture, mais je cède souvent à la tentation.
- 4 Habituellement, je limite ma consommation de nourriture et je cède rarement à la tentation.
- 5 Je dois tout le temps limiter ma consommation de nourriture et je ne cède jamais à la tentation.

51. A quel point l'énoncé suivant décrit-il votre comportement alimentaire?

" Je commence une diète le matin, mais pour toutes sortes de choses qui se produisent pendant la journée, je me retrouve en soirée où j'ai tout laissé tomber et je mange ce que je veux, en me promettant bien de me remettre à la diète le lendemain."

1  
ce n'est pas  
du tout comme  
moi

2  
ça me  
ressemble  
un peu

3  
ça me décrit  
assez bien

4  
ça me décrit  
à la  
perfection