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**Predicting Success and Failure at the Regulation of Eating Behaviours: Relations between Women's
Regulation Styles and Food Planning Strategies**

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Predicting Success and Failure at the Regulation of Eating Behaviours: Relations between
Women's Regulation Styles and Food Planning Strategies

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School of Psychology

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ABSTRACT

Recent studies based on self-determination theory (Deci & Ryan, 2002) have found that autonomous regulation is linked to healthy eating behaviours, while controlled regulation is linked to dysfunctional eating behaviours (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004). The main purpose of this thesis was to build on this previous work by examining the relations between regulation styles for eating behaviours and approach vs. avoidance food planning strategies in order to better understand success (healthy eating behaviours) and failure (bulimic symptoms and failure at weight-loss) at the regulation of eating behaviours. In total, three studies were conducted. In the first study, a new scale was developed to assess approach food planning and avoidance food planning, namely the Planning of Eating Behaviours Scale (PEBS). Results from confirmatory factorial analyses supported the two-factor structure of the scale. In addition, construct validity was assessed through correlations between the PEBS subscales and measures of well-being. In Study 2, mediational analyses were performed to examine whether approach and avoidance food planning could account for the effects of regulation styles on eating behaviours. Results indicated that approach food planning is a partial mediator of the relation between autonomous regulation and healthy eating behaviours, such that women with autonomous regulation are more likely to use approach food planning, which in turn is positively associated with healthy eating behaviours. Avoidance food planning was identified as a partial mediator of the relation between controlled regulation and dysfunctional eating behaviours (e.g., bulimic symptoms and food concerns), such that women with controlled regulation are more likely to use avoidance food planning which in turn is more likely to lead to dysfunctional eating behaviours. Finally, Study 3 examined whether two types of planning interventions alter the relationship between regulation styles and the outcome of the regulation. The approach-oriented intervention made women with high levels of autonomous regulation more successful at weight loss. Results also indicated a main positive effect for autonomous regulation on body weight goal attainment and healthy food choices. The avoidance-oriented intervention was found to have no impact on measures of success, whether on its own or in interaction with regulation styles.

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INTRODUCTION

The current media emphasizes extreme thinness as a standard for female beauty. Because most women do not measure up to the thin ideal of body weight, body dissatisfaction is very common among women. Consequently, many women exert efforts to regulate their eating behaviours in order to lose weight or maintain weight. A look at the wide range of dysfunctional eating behaviours and their prevalence among women, suggest that for some women the regulation of eating behaviours disrupts normal eating. In Canada, approximately 3% of women will suffer from an eating disorder (Health Canada, 2002; Zhu & Walsh, 2002). More specifically, 1.6 to 4.2% of women will develop bulimia, 2 to 5% of women will suffer from binge eating disorders, and 0.5 to 3.7% of women will develop anorexia (Mental Health Canada, 2001). The number of women with unhealthy eating behaviours that do not meet diagnostic criteria for an eating disorder is much higher. For example, 20% of college students present bulimic symptoms (Hoek, 1995). In addition, extreme weight-control activities (e.g., crash dieting, appetite suppressants, vomiting, skipping meals, fasting, and extreme exercise) are used by 30% of women (Drewnowski, Yee, Kurth, & Krahn, 1994). Finally, most women engage in mild dysfunctional eating behaviours, such as eating for other reasons than nourishment, feeling guilty after overeating, and being preoccupied with food thoughts.

Consistent overeating also represents a dysfunctional eating pattern that has increased dramatically in North America over the last 15 years (Jeffery, et al. 2000; Price & Pecjak, 2003). In Canada, between 1986 and 2000-2001, the prevalence of obesity (i.e., BMI > 30kg/m²) for women has increased from 7% to 14%, and the prevalence of stoutness (i.e., BMI between 25.0 and 29.9kg/m²) has increased from 19% to 26% (Health Canada, 2001). In the United States, it

has been recently estimated that 11% of children and adolescents are overweight (Lowry, et al., 2002).

Recent studies (Pelletier & Dion, in press; Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004), based on self-determination theory (SDT; Deci & Ryan, 1985; 2002), showed that the regulation of eating behaviours can lead to either positive outcomes (improving one's eating behaviours) or negative outcomes (development of dysfunctional eating behaviours). More specifically, these studies revealed that body dissatisfaction leads women to regulate their eating behaviours for different reasons that are more or less integrated into their sense of self.

Women can regulate their eating behaviours because they simply comply with social pressures to be thin and to obtain the rewards associated with it. Women can also partially internalize social pressures to be thin and regulate their eating behaviours out of self-imposed pressures, of a sense of obligation, or to avoid shame. These types of reasons for regulating eating behaviours reflect a controlled regulation since they are experienced as controlling and as something not truly desired. Women with a controlled regulation for eating behaviours are more at risk for developing dysfunctional eating behaviours. A more adaptive reaction to body dissatisfaction is represented by women who regulate their eating behaviours because they redefined the regulation to reflect who they are, what they value, and to represent their goals. In this case, the regulation is said to be autonomous because the women chose to regulate their eating behaviours because eating healthy is something they can do for themselves or because eating healthy is an integral part of their lifestyle. Women with an autonomous regulation for eating behaviours are more likely to develop healthy eating behaviours.

These findings made an important contribution to the study of the etiology of eating disorders by showing that differences in regulation styles can account for both the positive and

negative consequences of monitoring one's eating behaviours. In comparison, past models have focused mostly on the negative consequence of monitoring one's eating behaviours and on factors that put women at risk for eating disorders. In the sociocultural model of eating pathology, for example, when women perceive social pressures to be thin and internalize the thin ideal, they experience body dissatisfaction, which increases their risk for dieting, negative affect, and eating pathology (Stice, 2001; Stice, Shaw, & Nemeroff, 1998). Similarly, the dietary restraint model focuses on self-regulation of eating with the goal to lose weight by means of caloric deprivation (dieting) and its link to the onset and maintenance of binge eating and bulimia nervosa (Polivy & Herman, 1985).

The objective of this thesis was to build on previous findings based on SDT by examining how different orientations in food planning are related to regulation styles for eating behaviours in order to better understand the development of healthy eating behaviours and dysfunctional eating behaviours. More specifically, the different orientations in food planning examined in this thesis are approach food planning and avoidance food planning. In order to test the role played by these two types of food planning, we examined whether approach food planning accounts for the effect of autonomous regulation on healthy eating behaviours and whether avoidance food planning accounts for the effect of controlled regulation on dysfunctional eating behaviours. Then, we tested whether the impact of regulation styles on eating behaviours could be moderated by an intervention designed either to teach individuals to form specific approach or avoidance plans.

The present thesis was written in the form of two articles. The first article is composed of two studies pertaining to the mediating role of approach and avoidance planning. The second article examines the moderating impact of two interventions (one that aimed at teaching women

to form specific approach plans and one that aimed at teaching women to form specific avoidance plans), on the relation between regulation styles and eating behaviours. Thus, this thesis is composed of three studies.

In the first article, the first study concerned the development of the Planning of Eating Behaviours Scale (PEBS) and its initial validation. The PEBS was developed to assess approach food planning and avoidance food planning. Our conceptualization of these constructs was based on Elliot and colleagues' work on approach and avoidance goals (Elliot & Church, 1997; Elliot & Sheldon, 1997; Elliot, Sheldon, & Church, 1997). Approach food planning was defined as planning what to do in order to achieve the goal of healthy eating. Approach food planning focuses on the actions that will bring someone closer to the goal of healthy eating (Ex. "I usually think in advance about new and healthy recipes I want to try".) Avoidance food planning was defined as planning ways to avoid engaging in actions that would move someone further from the goal of healthy eating. Avoidance food planning focuses on preventing lapses or help control risky situations when one tends to engage in unhealthy eating behaviours (Ex. "I usually think in advance about strategies to avoid overeating / snacking when I get bored").

Confirmatory analyses were performed on the PEBS to examine how well the data supported the existence of two distinct subscales. To provide initial support for the construct validity of the PEBS, we examined correlations between the PEBS' subscales and measures of well-being. Because past studies have found that avoidance goals are associated with less well-being, we expected that avoidance food planning would negatively correlate with well-being. Because to our knowledge no scale is presently available to measure approach and avoidance food planning, this first study was necessary in order to verify the hypotheses of study 2

concerning the mediational role of approach and avoidance planning between regulation styles and eating behaviours.

More specifically, study 2 aimed at examining the process through which regulation styles for eating behaviours affect the extent to which women present healthy vs. dysfunctional eating behaviours. Approach and avoidance planning were chosen as potential mediators because they represent potentially modifiable variables that could suggest interventions to make women with autonomous regulation even more likely to develop healthy eating habits and to prevent women with a controlled regulation to develop unhealthy eating patterns. Two mediational models were tested in study 2 using the procedure outlined by Kenny, Kashy, and Bolger (1998). In the first model, we expected that approach food planning could, in part, explain the effect of autonomous regulation for eating behaviours on healthy eating behaviours. In the second model, we expected that avoidance food planning could, in part, explain the effect of controlled regulation for eating behaviours on dysfunctional eating behaviours. This last model was tested with two measures of dysfunctional eating behaviours, bulimic symptoms and eating concerns. Theoretical arguments and empirical evidence were also presented to justify the proposed relation between the antecedent and mediators, as well as between the mediators and the outcomes.

In the second article, our goal was to examine the effect of both an approach-oriented intervention and an avoidance-oriented intervention on the relationship between regulation styles for eating behaviours and success/failure at the regulation of eating behaviours. That study was conducted with women who expressed a goal of maintaining or losing weight. Success and failure at the regulation of eating behaviours was therefore assessed with a body weight goal attainment index. This index represents the difference between women's body weight goal they

had set for themselves at T1 and weight change between T1 and T2 (over a period of one month).

The interventions were based on the concept of implementation intentions which refers to a simple plan that specifies an anticipated situation and links it to a goal-directed action (Gollwitzer, 1999). The approach-oriented intervention consisted of asking women to form implementation intentions toward Wanted Responses (WR). More specifically, women were asked to list good opportunities to act toward goal attainment and to link each of those opportunities to a specific wanted action. For example, an individual who wants to form a plan to eat more fruits and vegetables everyday can write an implementation intention toward WR like this: “Each day, I will eat five servings of fruits and vegetables”. Implementation intentions formulated for WR consist of approach plans because they focus on the enactment of desirable actions (actions that will allow progress toward the goal).

The avoidance-oriented intervention consisted of asking women to form implementation intentions with respect to the Suppression of Unwanted Responses (SUR). These implementation intentions entailed listing critical situations that may elicit unwanted behaviours (behaviours that will not allow progress toward the goal) and to link each critical situation to a strategy designed to deal with those situations (either by intending not to perform the unwanted behaviour, by ignoring the critical situation and by specifying a counter-behaviour). For example, an individual who wants to form a plan to avoid eating chocolate can write an implementation intention toward SUR like this: “If I have a craving for chocolate, I will eat a low-fat chocolate pudding”. Implementation intentions toward SUR consist of avoidance plans because they focus on planning a strategy that prevents a person from moving away from their goal.

Based on our findings in the first article and past findings from other studies, our main hypothesis in the second article was that the WR intervention would make women with an autonomous regulation for eating behaviours even more successful. In other words, the WR intervention would enhance the relationship between autonomous regulation and success at weight loss by making the positivity of this relation considerably stronger.¹ This study also examined for the first time the impact of the SUR intervention on weight loss for women with an autonomous or controlled regulation for eating behaviours. Based on the findings presented in the first article, we could expect that forming implementation intentions on the SUR, which represent avoidance plans, could be detrimental to the goal of weight loss, especially for women with a controlled regulation. However, some studies suggest that implementation intentions toward SUR increase goal success at specific laboratory tasks and do not lead to negative outcomes (i.e., rebound effects) usually associated with avoidance-based strategies (Gollwitzer, Achziger, Schaal, & Hammelbeck, 2002; Gollwitzer, Fujita, & Oettingen, 2004). Given these two possible outcomes of implementation intentions toward SUR, we did not advance hypotheses for the impact of the SUR intervention. In sum, these represent the general hypotheses tested in the second article. Finally, in the last part of the thesis, a general discussion is presented.

Footnotes

¹ In the introduction, we have chosen to present the expected moderating effect in terms of the impact of each condition (the WR intervention, SUR intervention, and control conditions) on the relations between regulation styles and body weight goal attainment. This choice was made because we wanted to emphasize the role of planning strategies as mediators and then as moderators. Because the proposed interactions between regulation styles and the experimental conditions are symmetric, the expected moderating effects can also be interpreted in terms of the impact of regulation styles (different levels of autonomous and controlled regulations) on the relations between each experimental condition and body weight goal attainment. In the second article, we have chosen the second interpretation since many studies have reported inconsistent results regarding the beneficial impact of implementation intentions intervention. Therefore, the relations between implementation intentions and goal success have already been submitted to many analyses of moderators. We wanted to examine regulation styles as another potential moderator of these relations.

RUNNING HEAD: APPROACH AND AVOIDANCE FOOD PLANNING

How do Regulation Styles Influence Eating Behaviours? :
The Mediating Role of Approach and Avoidance Food Planning.

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Abstract

The purpose of this article was to examine the role played by different orientations in planning for eating behaviours as mediators of the relationship between regulation styles and eating behaviours. In Study 1, a new scale was developed to assess approach food planning and avoidance food planning. Results from confirmatory analyses (N= 241) supported the two-factor structure of the scale. In Study 2 (N= 202), in agreement with past research on the effects of autonomous and controlled motivation for the regulation of eating behaviours, we found that approach food planning mediated the effects of autonomous regulation for eating behaviours on healthy eating behaviours, while avoidance food planning mediated the effects of controlled regulation for eating behaviours on dysfunctional eating behaviours. Implications of these results for self-determination theory and for promoting healthy eating behaviours are discussed.

How do Regulation Styles Influence Eating Behaviours? :

The Mediating Role of Approach and Avoidance Food Planning

Women are constantly exposed to messages of thinness, ideals of beauty, and ways to lose weight. Because the ideal body size is unrealistically thin, most women are dissatisfied with their body. This explains in part why so many women try to regulate their eating behaviours in order to maintain or lose weight (Mazur, 1986; Pike & Rodin, 1991). Fortunately, the regulation of eating behaviours, initially engaged to satisfy society's thinness ideals, does not always lead to eating disorders but it can also lead to the adoption of healthy eating behaviours. When attempting to predict whether the regulation of eating behaviours will develop into healthy eating habits or disordered eating behaviours, it is important to examine the regulation styles for eating behaviours. Based on the self-determination theory (Deci & Ryan, 1985, 2002), Pelletier and his colleagues (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004; Pelletier & Dion, in press) have proposed that it makes an important difference whether the regulation of eating behaviours is autonomous versus controlled.

Autonomous regulation refers to a behaviour that has been internalized to the point that it is judged as personally valuable. The experience of autonomous regulation feels good since individuals have a sense of volition and responsibility with regard to the behaviours. Examples of autonomous regulation are women who regulate their eating behaviours because they believe it is a good thing they can do to ensure good health or because eating healthy is part of the way they choose to live their life. Conversely, controlled regulation refers to behaviours performed out of pressure from oneself or others. Then, controlled regulation is experienced as a conflict between two desired goals. On the one hand, individuals feel they ought to watch what they eat. On the other hand, they do not value healthy eating and it is not something they have truly

agreed to do. To illustrate, women regulate their eating behaviours because they would feel ashamed of themselves if they were not eating healthy or because other people close to them are insisting that they do. Consistent with SDT's predictions, some studies have linked autonomous regulation with healthy eating behaviours and controlled regulation with dysfunctional eating behaviours (Pelletier & Dion, in press; Pelletier et al., 2004).

The goal of this research is to examine the mechanism through which regulation styles influence eating behaviours. A likely mediator between the reason why women regulate their eating behaviours and the quality of their eating behaviours may be related to how women actually regulate their eating behaviours. In other words, it is plausible that the regulation styles lead to different outcomes because the regulation styles influence the means used to regulate eating behaviours. Therefore, we propose that different orientations in planning for eating behaviours explain the relationship between regulation styles and eating behaviours.

More specifically, we propose that an orientation toward approach food planning mediates the relationship between autonomous regulation and healthy eating behaviours, such that autonomous regulation promotes the use of approach food planning, which in turn fosters healthy eating behaviours. Alternatively, we propose that an orientation toward avoidance food planning mediates the relationship between controlled regulation and dysfunctional eating behaviours, such that controlled regulation increases the use of avoidance food planning, which consequently increases the risk for bulimic symptoms and eating concerns.

Relation Between Regulation Styles and Eating Behaviours

First, before elaborating on the proposed mediators, it is important to point out that there is solid support for the association between autonomous regulation and healthy eating habits, as well as a relationship between controlled regulation and dysfunctional eating behaviours.

Indeed, a motivational model which examined the relations between regulation styles, eating behaviours, and psychological well-being has been tested in two studies (Pelletier et al., 2004; Study 2; Pelletier & Dion, in press). Results revealed that women with an autonomous regulation tended to report eating more healthy foods. Women with controlled regulation tended to report more bulimic symptoms and were also less likely to eat healthy foods. A weak negative relation was found between autonomous regulation and bulimic symptoms. Furthermore, healthy eating behaviours and dysfunctional eating behaviours were shown to associate positively and negatively, respectively, with an increase in psychological well-being.

The different regulation styles for eating behaviours were also found to represent an important mechanism that explains why body dissatisfaction is related to both healthy eating behaviours and dysfunctional eating behaviours (Pelletier & Dion, in press). Pelletier et al.'s study aimed at making sense of the well-established finding that most women report body dissatisfaction but not all women suffer from eating problems. They tested a motivational model that included determinants of body dissatisfaction, motivation at different levels of generality, different eating behaviours, and psychological well-being. First, they found that while body dissatisfaction is strongly associated with the regulation of eating behaviours based on internal or external pressures (controlled regulation), body dissatisfaction is also associated with the regulation of eating behaviours based on a personal decision (autonomous regulation) to a lesser extent. Second, autonomous regulation of eating behaviours was associated with healthy eating behaviours, while controlled regulation of eating behaviours was associated with bulimic symptoms. Third, women's global sense of self-determination in their life was found to be associated with the way they approach the regulation of their eating behaviours in an autonomous manner or in a controlled manner.

Moreover, the role of autonomous regulation in achieving and maintaining changes in dietary behaviours was investigated in a medical setting with at-risk patients. Williams, Grow, Freedman, Ryan, and Deci (1996) conducted a study with severely obese patients enrolled in a very-low-calorie weight-loss program. They found that patients' autonomous regulation for weight-loss predicted their attendance in the program, which in turn predicted their weight-loss over the duration of the program (6-months). Furthermore, autonomous regulation predicted greater weight-loss and exercise maintenance at a 2-year follow-up.

Pelletier and colleagues (Pelletier, et al., 2004; Study 3) obtained similar results with patients at risk for coronary artery disease. Results from this study indicated that a global self-determined orientation measured at Time 1 was associated with autonomous regulation of dietary behaviours at Time 2 (13 weeks later), which in turn was associated with self-report of more healthy food choices (food with less % calories from fat), improvement in dietary behaviours, a decrease in body weight, and an improvement in blood lipid parameters at Time 3 (26-week after baseline). Thus, because the relations between regulation styles and different eating behaviours are well established, we can examine potential mediators of these relations.

The Nature of Approach and Avoidance

The proposed mediators in the present research are approach food planning and avoidance food planning. A considerable amount of research on the approach-avoidance distinction has been conducted at the goal level (Carver & Scheier, 1998; Elliot & Church, 1997; Higgins, 1987; Markus & Nurius, 1986). Elliot and colleagues have examined the difference between personal goals framed in an approach manner and in an avoidance manner. Personal goals are defined as personally important objectives that orient individuals' day-to-day actions and give meaning to their life (Elliot, Sheldon, & Church, 1997). They argued that the main difference between approach and avoidance personal goals concerns the regulatory focus of the

goal. According to Elliot and his colleagues (1997), approach goals focus on desirable objectives, and involve moving toward the desirable objectives (e.g., trying to do more charity work, trying to be more patient when driving, to exercise daily), whereas avoidance goals focus on undesired objectives and involve moving away from undesired objectives (e.g., trying to avoid being late, to not litter, to stop procrastinating).

Research has indicated that how individuals formulate their personal goals has important consequences for their overall well-being. Individuals who use approach goals are more likely to evaluate themselves positively (higher self-esteem, more capable of achieving goals) and are less likely to report depressive symptoms than individuals who use avoidance goals (Coats, Janoff-Bulman, & Alpert, 1996). Further, people with a predominance of avoidance goals tend to perceive less goal progress and subsequently, tend to experience less positive affects and life satisfaction (Elliot, Sheldon, & Church, 1997). The negative consequences of avoidance goals also extend to the experience of physical symptoms (Elliot & Sheldon, 1997; 1998).

The distinctive nature of avoidance goals explains why this type of goal is not optimal. First, avoidance goals are a form of negative thinking (i.e., the possibility of failure is always in one's mind) and may thus induce negative emotions (e.g., worry, anxiety) that have been linked with poorer self-regulation. Second, avoidance goals are more likely to yield failure feedback (Coats, et al., 1996). People tend to favor feature-positive searches when assessing their behaviours because these are more efficient and less effortful than feature-negative searches. Thus, for the goal of avoiding eating too much, individuals tend to search for instances when they eat too much and not instances when there is absence of eating too much. Given that when individuals test an hypothesis, they tend to conduct searches for evidence supporting their

hypothesis, the hypothesis of “Am I eating too much” is likely to be confirmed and yield failure feedback (Snyder, 1981).

Approach and Avoidance Planning

Similar to goals at a high level of abstraction, goals at a more concrete level such as plans can be either construed in an approach or avoidance manner (Carver & Scheier, 1998). However, very few studies have examined the approach and avoidance orientation at the planning level. One exception is the recent study by Dickson and MacLeod (2004), which examined both approach-avoidance goals and plans. They defined approach plans “as steps a person would take to bring about a personal goal, whereas avoidance plans represent a strategy of not doing certain things in order that the goal will be achieved” (Dickson & MacLeod, 2004, p 417). They found that mood-disturbed adolescents (highly depressive and high anxiety) use more avoidance plans than healthy adolescents. Thus, this study suggests that avoidance plans like avoidance goals are negatively associated with well-being. Dickson and MacLeod (2004) argued that avoidance plans are especially emotionally and cognitively taxing because they require the active mental simulation of all future unwanted behaviours and the elaboration of strategies to avoid enacting these behaviours.

Approach and avoidance planning, as defined by Dickson and MacLeod, can be easily applied to the context of the regulation of eating behaviours. For example, the goal of trying to eat healthier can be achieved by subgoals (or plans) that can be framed in an approach manner (e.g., trying to drink two glasses of milk a day, trying to eat more green vegetables, trying new healthy recipes) and in an avoidance manner (e.g., avoiding fried foods, trying not to eat big portions, strategies to avoid overeating, etc.). We found some reference to approach and avoidance food planning in treatment programs for serious eating disorders and in prevention

programs for at risk individuals (Fairburn, Marcus, & Wilson, 1993; Garner, Vitousek, & Pike, 1997). Although the exact terms of approach and avoidance planning are not used, there is some mention of the importance of planning to incorporate different foods and of the negative consequences of dietary restriction. In sum, there is some evidence that the investigation of the approach and avoidance distinction at the food planning level is worthwhile. However, no scale exists to measure approach and avoidance food planning. Therefore, a goal of this research is to develop such a scale.

Relation between Regulation Styles and Planning

Approach and avoidance planning were chosen as mediators because their relationship with the proposed antecedents (autonomous and controlled regulation) and their proposed consequences (healthy food choices and dysfunctional eating behaviours) can be theoretically explained and supported by research. Clear theoretical rationale and empirical findings support the hypothesis that regulation styles are differently related to food planning. For example, a recent study suggests that women with different regulation styles think differently about foods (Pelletier, et al., 2004; Study 2). They found that women with an autonomous regulation are more concerned by the quality of food they eat while women with a controlled regulation are more concerned by the quantity of food they eat. Because eating food high in quality is an action that often moves someone toward healthy eating, women with an autonomous regulation may use more approach plans. Because concerns about the quantity of food often reflect the concerns of not eating too much, women with a controlled regulation may use more avoidance food planning.

Conceptually, the hypothesized link between autonomous regulation and approach food planning can also be explained. Autonomous regulation involves the decision to monitor one's

eating behaviours because it reflects one's deep values, and interests, or it is useful for the individual. Thus, this well-thought decision may likely result in more approach planning, which is planning actions that will bring about healthy eating. In fact, autonomous regulation, in general, has been associated with consequences that suggest active involvement in an activity and a focus on the positive aspect, such as: creativity, enjoyment, deep-processing, information-seeking, enjoyment of challenges, persistence, and effort mobilization, (Amabile & Gitomer, 1984; Black & Deci, 2000; Grolnick & Ryan, 1987; Lee, Sheldon & Turban, 2003; Séguin, Pelletier, & Hunsley, 1998).

A close examination of the definition of controlled regulation also supports the idea that it should be linked to avoidance planning. Controlled regulation of eating behaviours represents a regulation based on feelings of obligation and pressures (e.g., be thin, maintain self-esteem) instead of stable internal preferences and values (Koestner, Losier, Vallerand, & Carducci, 1996; Scherhorn & Gruner, 1988). Given that controlled regulation lacks a sense of choice and a personal valuation of the regulation, it is not surprising that it has been linked with conflictual emotions, tension, and vulnerability to persuasion (Koestner, et al., 1996; Ryan & Connell, 1989). Thus, women with a controlled regulation for eating behaviours may tend to use more avoidance planning in order to be less susceptible to adverse situational influences (e.g., tempting foods, situations when they tend to overeat). Further, controlled regulation is characterised by a negative emotional tone (Ryan & Deci, 2000). In keeping with this state of mind, women with controlled regulation may tend to select unpleasant strategies (i.e., avoidance strategies).

Relation between Planning and Eating Behaviours

Past findings support the hypothesis that different types of planning influence eating behaviours. A number of studies have found an association between meal planning and healthy eating behaviours. For example, Verplanken and Faes (1999) observed that participants, who were instructed to plan foods to be eaten at each meal for a chosen day in the week, reported having consumed more fruits and vegetables during the entire week. Similarly, Armitage (2004) examined the influence of detailed plans about how to eat a low-fat diet on dietary fat intake measured one month later. While controlling for motivation, this last study observed a reduction in dietary fat intake only among participants who made plans. Parents who planned their meals in advance also reported eating more fruits and vegetables (Boutelle, Birnbaum, Lytle, Murray, & Story, 2003). Because meal planning is similar to approach plans in terms of their content and focus (they both specify actions to be taken that allow advancement toward a goal), we propose that approach food plans are associated with healthy eating behaviours.

Although we did not find studies that have examined food plans that shared some characteristics with avoidance plans, we found several studies that have demonstrated the negative impact of food restriction. It has been long recognized that a common characteristic of eating pathology is avoidance of dietary fat (Drewnowski, Pierce, & Halmi, 1988; Rock, Demitrack, & Drewnowski, 1996). Furthermore, food restriction and deprivation were found to cause eating disorders (McFarlane, Polivy, & McCabe, 1999; Urbszat, Herman, & Polivy, 2002). Other studies have found that trying to ignore, and suppress bad foods leads to an intense preoccupation of these denied foods (Wegner, Schneider, Carter, & White, 1987). In sum, since restriction in diet was found to lead to negative outcomes, we propose that planning for these actions (avoidance food planning) is associated with bulimic symptoms and disordered eating.

The Present Studies

The main goal of the present research is to examine approach and avoidance planning as potential mediators responsible for the effect of regulation styles on eating behaviours. For this purpose, two studies are conducted. In study 1, we provide initial support for a scale developed to measure approach and avoidance food planning. In study 2, we test the extent to which approach food planning can account for the relationship between autonomous regulation and healthy eating behaviours. We also test the extent to which avoidance food planning can account for the relationship between controlled regulation and dysfunctional eating behaviours.

Study 1

The goal of this study is to develop and provide a first validation of a new scale, namely the Planning of Eating Behaviours Scale (PEBS). The first step of this study consists of generating items to measure the two proposed subscales of the PEBS, the approach food planning and the avoidance food planning subscales. Approach food planning represents thinking ahead about things that move someone toward the goal of healthy eating such as planning for the quality of food and including fruits and vegetables in meals. Conversely, avoidance food planning represents thinking in advance about strategies of not doing things that would harm the goal of healthy eating, such as planning strategies to avoid succumbing to fattening food, and planning strategies in order to not eat too much in critical situations. Then Confirmatory Factor Analyses (CFA) were performed to examine whether the responses to the PEBS could best be explained by two factors (subscales). Finally, correlations between the two subscales and measures of well-being were examined to provide assessment on the construct validity of the PEBS. Previous studies have shown that avoidance goals are associated with less well-being than approach goals. It was therefore expected that plans that focus on avoiding food

would correlate negatively with well-being and that plans that focus on approaching food would correlate positively with well-being.

Development of the PEBS

In a prior study, we instructed participants to list planning strategies for better eating (Otis & Pelletier, 2006; Study 1). The development of items to represent approach food planning and avoidance food planning was partly based on these written responses given by participants. The development of items was also based on a brain storming session on planning of eating behaviours in which different researchers interested in health behaviours and self-regulatory strategies participated. A list of 14 items was generated (7 items for approach food planning and 7 items for avoidance food planning). Participants indicated the extent they thought in advance about the activities described in the items on a scale ranging from 1 (“never”) to 7 (“always”). An example of items for the approach food planning subscale is “I think about the quality of food I will eat” and for the avoidance food planning subscale is “I think about the set of responses to be used when I encountered situations where I tend to overeat (i.e., parties, holidays)”.

Method

Participants and Procedures

Participants were 250 women attending University of Ottawa (94% undergraduate students and 6% graduate students). Ages ranged from 17 to 46 years ($M = 20.54$; $SD = 3.37$). Participants lived with their family (61.3%), in residence (7.8%), with friends (14.4%), with a partner (10.3%), or alone (6.2%). Reported programs of study (3% of participants did not report) were in the faculty of social sciences (31.2%), of arts (28%), of science (13.2%), of health sciences (6.4%), of management (14%), of engineering (2.4%), or of law (1.6%). The average

Body Mass Index (BMI; Kg/m^2), for a sub-sample of 237 participants who reported their weight and height, was 22.37^1 ($SD= 3.58$; range 16.04 to 37.79).

Participants were recruited in the cafeteria of the University of Ottawa. The researcher approached individuals and small groups of people and introduced the purpose of the study. The study was described as an investigation of women's eating habits and their reasons for trying to regulate their eating behaviours. Participants were told that participation involved completing a questionnaire that took approximately 20 minutes. After participants were informed about the confidential, anonymous, and voluntary nature of the study, they were asked if they would be willing to fill out the questionnaire. Participants who were sitting with others were asked to answer the questions individually. For those who chose to complete the questionnaire immediately, the researcher returned later to collect the questionnaire. Other participants chose to complete the questionnaire later and to return it in a prepaid envelope. The questionnaire included the PEBS and a vitality measure, as well as some measures not relevant to this article. In order to limit the number of scales in the questionnaire, the well-being measure was added in the questionnaire only for a sub-sample of 167 participants.

Measures

Vitality. A modified version of the vitality scale developed by Ryan and Frederick (1997) was used in this study (See Appendix A). This scale measures the extent to which participants feel energetic, alert, and alive in general in their life. A sample item is "I feel alert and awake." Participants indicated the extent they agreed with the different statements on a scale ranging from 1 ("Not at all true") to 5 ("Very true"). The Cronbach alpha coefficient for this measure was .84.

Psychological well-being. Participants completed the Psychological Well-being Scale (PWB, Ryff & Keyes, 1995, see Appendix A), which measures six aspects of psychological well-being: self-acceptance (e.g., “I like most aspects of my personality”); environmental mastery (e.g., “I am quite good at managing the many responsibilities of my daily life”); positive relations with others (e.g., “Maintaining close relationships has been difficult and frustrating for me”); autonomy (e.g., “I tend to be influenced by people with strong opinions”); purpose in life (e.g., I live life one day at a time and don’t really think about the future); and personal growth (e.g., “For me, life has been a continuous process of learning, changing, and growth”). Each subscale is assessed with 3 items, for a total of 18 items. Participants indicated their level of agreement with each statement on a scale ranging from 1 (Strongly disagree) to 6 (Strongly agree). The Cronbach alpha coefficient for this measure was .71.

Results

Preliminary Analyses

The data were screened in order to ensure compliance with the basic assumptions of multivariate analysis. Three cases displayed significant Mahalanobis’ distances ($\chi^2 (df= 14) > 36.12, p < 0.001$.) and these cases were deleted. Nine cases with missing data were also deleted. Thus, the final data set consisted of 241 participants. Descriptive statistics for all items (see Table 1) and the expected normal probability plots satisfied the assumption of normality. There was no evidence of multicollinearity or singularity, and the relations between the observed variables were linear.

Confirmatory Factor Analyses

The hypothesized 2-factor model was tested with CFA using maximum-likelihood estimation and the EQS 6.1 program. The fit indexes of the model revealed that the 2-factor

model provided a marginal fit for the data ($\chi^2(76, n=239)=186.80$; CFI=.90; RMSEA=.08 [.06 to .09]; GFI=.90). Post hoc model modifications were performed to improve the fit of the model. The Lagrange multiplier test revealed that the inclusion of one error covariance (between the item “The quality of food I will eat” and the item “The variety of food I will eat”) in our two-factor model would lead to a large significant drop in χ^2 . Accordingly, this re-specified model provided an acceptable fit to the data, ($\chi^2(75, n=239)=162.32$; CFI=.92; RMSEA=.07 [.05 to .08]; GFI=.91). All factor loadings were significant (see Table 1). A moderate and positive correlation was observed between approach food planning and avoidance food planning ($\beta=.45$; $z=4.06$). The internal consistency (alpha) for both subscales were satisfactory (approach: $\alpha=.79$; avoidance: $\alpha=.84$)

An alternative single-factor was also tested, $\chi^2(76, n=239)=339.90$, CFI=.75; GFI=.80; RMSEA=.12 [.10 to .13]. This model provided a significantly poorer fit than the hypothesized two factor solution; $\chi^2_{\text{diff}}(1)=177.58$; $p<.001$.

Relationship Between the PEBS Subscales and Well-Being

Correlations between the PEBS subscales and well-being scales are displayed in Table 2. As expected, a negative correlation was found between the avoidance food planning subscale and vitality ($-.25, p<.00$), while a positive correlation was found between the approach food planning subscale and vitality ($.15, p<.05$). Further, the avoidance food planning subscale was found to associate negatively with the psychological well-being scale ($-.23, p<.01$), and more precisely with its personal growth subscale ($-.20, p<.05$) and its environmental mastery subscale ($-.25, p<.01$). The approach food planning subscale was found to associate positively with the self-acceptance subscale ($.21, p<.01$) of the psychological well-being scale. These correlations between the PEBS subscales and well-being measures offer initial support for construct validity.

Discussion

The results of Study 1 offer initial empirical support for the validity of the PEBS, a new scale that measures approach food planning and avoidance food planning. The PEBS subscales showed good item dispersion, adequate reliability, and hypothesized correlations with other constructs associated with the regulation of eating behaviours and psychological constructs associated with individuals functional well-being.

Study 2: Testing the Mediation Models

The purpose of Study 2 is to examine the role that approach and avoidance food planning could play as mediators of the relations between regulation styles and eating behaviours. In the first mediational model, we expect approach food planning to mediate the relationship between autonomous regulation for eating behaviours and healthy food choices, such that the association between autonomous regulation and healthy eating behaviours is reduced when approach food planning is accounted for. In the second mediational model, we expect avoidance food planning to mediate the relationship between controlled regulation for eating behaviours and dysfunctional eating behaviours, such that the association between controlled regulation and dysfunctional eating behaviours is reduced when avoidance food planning is accounted for.

Method

Participants

A total of 202 women attending University of Ottawa participated in study 2 (92.6% undergraduate students and 7.4% graduate students). The age of the participants ranged from 16 to 55 years ($M = 20.49$, $SD = 3.82$). Participants were registered in the faculty of social sciences (33.4%), of arts (18.9%), of science (18.4%), of health sciences (8.3%), of management (8%), of law (2.5%), or of engineering (.5%). About 10% of participants did not report their program of

study. The average Body Mass Index (BMI; Kg/m^2), for a sub-sample of 191 participants who reported their weight and height, was 22.59 ($SD= 3.89$; range 15.95 to 39.93). Participants were recruited in the cafeteria using the same procedure described in study 1. Approximately 20 minutes were needed to complete the questionnaire.

Measures (See Appendix B for all the following scales)

Planning of Eating Behaviours. Planning of eating behaviours was assessed using the PEBS developed in study 1. The alpha coefficient for the approach food planning and the avoidance food planning subscales was .82, and .85, respectively.

Regulation of Eating Behaviors. The Regulation of Eating Behaviors Scale (REBS; Pelletier et al., 2004) measures the 6 different regulation styles proposed by the self-determination theory (Deci & Ryan, 1985): intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. The 6 subscales are composed of 4 items each, for a total of 24 items. Each item represents possible reasons why people might try to regulate their eating behaviours. Participants indicated the degree to which the proposed reasons corresponded to their reasons on a scale ranging from 1 (Does not correspond at all) to 7 (Corresponds exactly). For this study's purpose, an autonomous regulation variable was computed for each participant by adding the intrinsic motivation, integrated regulation, and identified regulation subscales ($\alpha= .89$). A controlled regulation variable was also computed for each participant by adding the introjected regulation, external regulation, and amotivation subscales ($\alpha= .82$).

Healthy Eating Habits. The Healthy Eating Habits Scale (Pelletier et al., 2004) measures participants' food choices according to the recommendations made by the Canada's Food Guide. This 8 item-scale has two subscales, each with 4 items. The two subscales are: healthy foods

(e.g. “I eat vegetables, fruits, and grain products”), and foods that should be eaten with moderation (e.g., “I eat foods such as chips, chocolate, and candies”). For this study’s purpose, we used the healthy food subscale. Participants indicated the extent to which they ate the different foods described in the items on a scale ranging from 1 (“Not at all”) to 5 (“All the time”). The alpha coefficient for this measure was .75.

Bulimic Symptoms. Participants completed the BULIT-R scale (Thelen, Farmer, Wonderlich, & Smith, 1991). The BULIT_R is composed of 28-items based on the DSM-III-R criteria for bulimia. This scale was found to be a cost-effective tool to screen bulimia nervosa in clinical and non-clinical populations. Participants scoring 104 and above are likely to be diagnosed as bulimic in an interview in clinical settings. Participants were asked to choose among five answers (1 to 5), the one that applies best to them. The alpha coefficient for this measure was .92.

The Eating Disorder Examination-Self Report Questionnaire (EDE-Q; Fairburn & Beglin, 1994). We used 5 items from the eating concerns subscale of the EDE-Q: the *weight fluctuation* item (“Would a weight fluctuation of 5 lbs. affect the way you live your life?”), the *splurge alone* item (“Do you eat sensibly in front of others and splurge alone?”), the *food thoughts* item (“Do you give too much time and thought to food?”), the *guilt after overeating* item (Do you have feelings of guilt after overeating?), and the *fear of losing control* item (“Do you fear loss of control over eating?”). Participants were asked to circle one of the 4 answers (1- Never; 2-Rarely; 3-Often; 4-Always). The alpha coefficient for this measure was .83.

Results

Descriptive Statistics.

Table 3 presents the descriptive statistics for the main variables in this study, as well as correlations among them. In average, participants reported that autonomous motivation ($M=4.44$) corresponded the most with their reasons for regulating their eating behaviours. Controlled regulation ($M=2.32$) did not very much correspond to the reasons why they are regulating their eating behaviours. In general, participants reported a higher level of approach food planning ($M=4.03$) than avoidance food planning ($M=3.19$). Participants generally reported that they often eat according to the Canada's Food Guide ($M=3.68$). Participants' mean score on dysfunctional eating fell in the middle of the 4-point scale ($M=2.09$). Participants' bulimia score ranged from 33 to 105 ($M=56.33$, $SD=17.52$). Two participants (1%) met the BULIT-R criteria for bulimia (score of 104 or higher).

Consistent with our prediction, autonomous regulation correlated positively with approach food planning, and controlled regulation correlated positively with avoidance food planning. While we expected a negative correlation between autonomous regulation and avoidance food planning, we observed a positive correlation. However, autonomous regulation correlated substantially more with approach planning than avoidance planning. Controlled regulation correlated non-significantly with approach planning. Again, in line with our hypotheses, autonomous regulation and approach food planning both correlated positively with healthy food choices. Conversely, controlled regulation and avoidance food planning both correlated positively with unhealthy eating (i.e., dysfunctional eating and bulimia symptoms). An unexpected finding is that avoidance food planning also correlated positively, but less strongly, with healthy eating.

Mediation Analyses

Mediational analyses were performed with multiple regressions. We followed the 4 steps outlined by Kenny and his colleagues to establish mediation (Kenny, Kashy, & Bolger, 1998). The first step is to show that a significant relation exists between the predictor (e.g., autonomous regulation) and the outcome (e.g., healthy food choices). The second step is to show that a significant relation exists between a predictor and a proposed mediator variable (e.g., approach food planning). The third step is to show that a significant relation exists between the proposed mediator and the outcome (with the predictor controlled). The final step is to show that, when the mediator is controlled, the previously significant relation between the predictor and the outcome is significantly reduced. To test the significance of the mediating variable effect, we used the method described by Kenny et al. (1998).²

The first series of mediation analyses tested whether food planning variables (i.e., approach and avoidance food planning) mediated the effect of autonomous regulation on healthy food choices. To meet the requirement of step 1, we regressed healthy food choices on autonomous regulation. This result showed that autonomous regulation was a significant predictor ($\beta = .54$, $p < .001$). Two regression analyses in which approach food planning and avoidance food planning were regressed on autonomous regulation were performed to test step 2. The analyses showed a significant effect of autonomous regulation on approach food planning ($\beta = .62$, $p < .001$), as well as a significant effect of autonomous regulation on avoidance food planning ($\beta = .27$, $p < .001$). To meet the requirements for step 3, we conducted a hierarchical multiple regression, in which, we entered in step 1 autonomous regulation, and in step 2 both approach food planning and avoidance food planning. We found a significant effect of approach food planning on healthy food choices ($\beta = .33$). We did not find, however, that avoidance food

planning contributed significantly to the prediction of healthy food choices ($\beta = .04$, $p > .05$).

Thus, only approach food planning met the requirement of step 3 and could be tested for step 4.

Considering these results, we performed a final regression in which autonomous regulation and approach food planning were simultaneously regressed on healthy food choices. We found that the effect of autonomous regulation on healthy food choices was reduced ($\beta = .34$). A test of mediation confirmed that this reduction was significant ($z = 3.98$ [0.08 to 0.22]). These results establish approach food planning as a partial mediator of the relationship between autonomous regulation and healthy food choices. Overall, the mediational model accounted for 35% of the variance in healthy food choices. Results for this mediation analysis are displayed in Table 4.

The second series of mediation analyses tested whether food planning variables could account for the effect of controlled regulation on bulimic symptoms. As in the first mediation analysis, a set of regression analyses was performed in order to examine the 4 steps. There was a significant relation between controlled regulation and bulimic symptoms ($\beta = .53$, $p < .001$, step 1). There was also a significant relation between controlled regulation and avoidance food planning ($\beta = .46$, $p < .001$; step 2). However, there was no significant relation between controlled regulation and approach food planning ($\beta = .06$, $p > .05$; step 2). Because approach food planning did not meet the condition for step 2, it was not included in further analyses.

A model that regressed bulimic symptoms simultaneously on controlled regulation and avoidance food planning, indicated a significant relation between avoidance food planning and bulimic symptoms ($\beta = .23$, $p < .01$; step 3). More importantly, this last result showed that the relationship between controlled regulation and bulimic symptoms is weaker when we control for the effect of avoidance food planning ($\beta = .42$, $p < .001$; step 4). A test of mediation confirmed

that this reduction was significant ($z = 2.75$ [0.02 to 0.14]). Thus, these analyses support the hypothesis that avoidance food planning is a partial mediator between controlled regulation and bulimic symptoms. However, considering that the confidence interval includes a number very close to 0 (0.02), the partial mediating effect is not very strong. Overall, the mediational model accounted for 31% of the variance in bulimic symptoms. Results for this mediation analysis are displayed in Table 5.

The third series of mediation analysis examined whether food planning variables mediated the effect of controlled regulation on eating concerns. We again followed the same steps outlined earlier for testing mediation. In step 1, a first regression showed a significant relation between controlled regulation and eating concerns ($\beta = .55$, $p < .001$). In step 2, a regression showed a significant relation between avoidance food planning and controlled regulation ($\beta = .46$, $p < .001$) and another regression showed a non-significant relation between approach food planning and controlled regulation ($\beta = .06$, $p > .05$). Since approach food planning did not meet the condition for step 2, we tested only for the mediational effect of avoidance food planning.

We performed a final regression to test the relation between controlled regulation and eating concerns while controlling for avoidance food planning. The condition for step 3 was met; a significant path was observed between avoidance food planning and eating concerns ($\beta = .44$, $p < .001$). The impact of controlled regulation on eating concerns was also reduced ($\beta = .35$, $p < .001$; step 4). A test of mediation confirmed that this reduction was significant ($z = 5.2$, CI [0.11 to 0.23]). Therefore, we concluded that avoidance food planning was a partial mediator of the relation between controlled regulation and eating concerns. Overall, the mediational model

accounted for 45% of the variance in eating concerns. Results for this mediation analysis are displayed in Table 6.

Discussion

Correlational analyses in study 2 provided interesting results regarding the relations between regulation styles, food planning, and eating behaviours. First, we found that women with an autonomous regulation for eating behaviours are more likely to engage in approach food planning and that women with a controlled regulation are more likely to engage in avoidance food planning. Of interest, we found a positive and small relation between autonomous regulation and avoidance food planning. This finding suggests that even if women with an autonomous regulation engage more often in approach food planning, they also engage in avoidance food planning.

Second, we found that approach food planning is linked to healthy eating behaviours while avoidance food planning is linked to dysfunctional eating behaviours. Interestingly, our results revealed that avoidance food planning is also linked to healthy eating behaviours. This finding can be explained by Carver and Scheier's (1998) work on approach and avoidance goals. According to Carver and Scheier, avoidance goals on their own are less functional because they lead individuals moving away endlessly from their goal while not knowing in which direction they should move or what they want to attain. However, when avoidance goals are combined by approach goals they can be adaptive and functional. Approach goals provide a positive value that guides the self-regulation in a precise direction. Thus, avoidance food planning may lead to healthy food choices if they are used simultaneously with approach food planning. Future studies could examine if using both approach food planning and avoidance food planning is better than using only approach food planning.

Finally and most importantly, regression analyses in study 2 provided support for the two proposed mediational models. More specifically, we found that approach food planning partially accounted for the relationship between autonomous regulation and healthy eating behaviours. We also found that avoidance food planning partially accounted for the relationship between controlled regulation and dysfunctional eating behaviours (bulimic symptoms and eating concerns). In this last model, we found that avoidance food planning was a more powerful mediator of the relationship between controlled regulation and food concerns than of the relationship between controlled regulation and bulimic symptoms.

One possible reason for this pattern of results is that these measures assess dysfunctional eating behaviours at different levels of severity. The measure of bulimic symptoms assesses the presence of bulimic symptoms (e.g., episodes of binge eating, the use of inappropriate compensatory methods to prevent weight gain, and self-evaluation based on weight and shape) while eating concerns reflect warning signs that a woman may be at risk for developing an eating disorder. Therefore, avoidance food planning seems more relevant to account for the effects of controlled regulation on the onset of dysfunctional eating patterns than on the development of more severe eating disorders.

General Discussion

The main goal of this research was to examine how food planning affects the relation between regulation styles and eating behaviours. Past studies have consistently shown that autonomous regulation for eating behaviours is associated with the adoption of healthy eating behaviours and that controlled regulation for eating behaviours is associated with the development of dysfunctional eating behaviours. We posited that approach food planning could account for the effect of autonomous regulation on healthy eating behaviours. We also proposed

that avoidance food planning could explain the effect of controlled regulation on dysfunctional eating behaviours. A related goal of this research was to conceptualize approach and avoidance food planning and to develop a new scale to measure these concepts (the PEBS).

The PEBS

Confirmatory factor analyses performed on the PEBS provided initial evidence for the existence of two distinct types of food planning. It seems like individuals can plan their eating behaviours by either thinking about what to do in order to achieve their goal (approach food planning) or thinking about ways to avoid engaging in actions inconsistent with their goal (avoidance food planning). The substantial correlation ($\beta = .45$) between approach food planning and avoidance food planning suggests that participants use both type of food planning. Approach and avoidance planning are postulated to be used irrespectively of the type of goals pursued (approach or avoidance goals; Carver & Scheier, 1998). More specifically, approach food planning (the plan to eat more fruits and vegetables) has the same meaning that is, to help a person get closer to their goal, for either the goal “to improve my eating behaviours” or the goal “to not eat junk food”. Likewise, avoidance food planning (the plan to avoid eating at fast-food restaurants) refers to a strategy that prevents a person from moving away from either their goal “to improve my eating behaviours” or their goal “to not eat junk food”.

Consistent with prior research (Coats, et al., 1996; Elliot, Sheldon, & Church, 1997), we found that an approach orientation is positively associated with well-being while an avoidance orientation is negatively associated with well-being. Of interest, our study used measures of well-being that have not yet been linked to approach and avoidance orientation. The finding that approach food planning is related to more vitality and that avoidance food planning is related to less vitality is easily explainable. Indeed, avoidance food planning may leave individuals feeling

drained and tired because this strategy requires that individuals attend to an infinite number of unhealthy foods, critical situations, and bad eating habits (overeating). To the contrary, approach food planning is relatively simpler since it identifies a smaller number of actions that have been chosen to attain their goal. Also, approach food planning focuses on behaviours consistent with successful goal attainment and this form of positive thinking may leave individuals feeling energized and revitalized. Thus, it is ironic that people use planning strategies to help them attain their goal, but in the case of avoidance food planning, this strategy seems to be counterproductive. The avoidance planning strategy drains a person of her energy and this lack of energy makes the person more likely to fail at subsequent self-regulatory attempts (Baumeister, Heatherton, & Tice, 1994).

Another noteworthy finding is the negative relation between avoidance food planning and both environmental mastery and personal growth. These results are consistent with the proposed motivational underpinnings of avoidance orientation. More specifically, the literature on achievement-avoidance goals indicates that this type of goal is grounded in the fear of failure, and low competencies (Elliot & Church, 1997). Thus, if avoidance food planning is motivated by fear of failure, it makes sense that it is incompatible with personal growth, which often reflects a willingness to fail in order to learn from one's mistakes. In the same way, if avoidance food planning implies low competencies, it is not surprising that it is incompatible with feeling competent to deal with the demands of one's life. Finally, we recognize that the findings on the PEBS's validity are preliminary in nature. It would be important for future studies to provide further evidence for the construct validity of the PEBS, as well as demonstrating that the PEBS subscales are reliable predictors of eating behaviours. In addition, the temporal stability of PEBS remains to be examined.

Test of the Proposed Mediation Models

We found supportive evidence for the two proposed mediational models. First, our data was consistent with the model postulating that autonomous regulation for eating behaviours is associated with greater use of approach food planning which subsequently is associated with the development of healthy eating behaviours. Second, our data was also consistent with the model postulating that controlled regulation for eating behaviours is associated with greater use of avoidance food plans, which, in turn, is associated with the development of dysfunctional eating behaviours. Because, for both regression models, we found that the direct path between the regulation styles and eating behaviours remained significant, we can suggest that food planning variables represent partial mediators of these regulation styles-eating behaviours relations. Therefore, we conclude that regulation styles influence eating behaviours directly, as well as indirectly, by their effects on food planning. Thus, this finding underlines once more that successful regulation requires both motivation to drive individuals to self-regulate and the elaboration of strategies in order to translate that motivation into purposeful actions for affecting their behaviours and the outcomes of the self-regulation (Corno, 1992; Khul, 1985; Slovinec-D'Angelo, Reid, & Pelletier, 2005).

Partial mediation often suggests multiple mediating factors. Food planning may represent only one route by which regulation styles influence the development of different eating patterns. The percentages of explained variance yielded by the mediational models ($R^2 = .31$ to $.45$) also suggest that the inclusion of additional mediating variables may provide a better understanding of the process by which regulation styles affect eating behaviours. In fact, several theories propose that self-regulation is a controlled and effortful process that requires the use of many self-regulatory strategies (Baumeister, Heatherton, & Tice, 1994). Future research might

examine different types of monitoring strategies as potential mediators of the relationship between regulation styles and eating behaviours. For example, women with an autonomous regulation may be more successful at the regulation of their eating behaviours because they use more process-focused strategies, such as keeping food records, trying to become more aware of satiety and hunger signals, emotion control, seeking information, and seeking social support. By contrast, women with controlled regulation may fail more at the regulation of eating behaviours because they use more outcome-focused strategies, including weighing oneself, imagining positive and negative consequences of eating behaviours (be thin vs. shortened life). Consistent with this line of reasoning, Patrick, Canevello, and Knee (2004) found that autonomously motivated individuals used more weight loss strategies focused on the process of changing one's lifestyle (e.g., change eating habits; start exercise) and controlled motivated individuals used more weight loss strategies focused on quickly seeing results (e.g. diet supplements; weight-loss programs).

Implications for Self-Determination Theory (SDT)

According to SDT, one of the reasons why autonomous regulation leads to more positive consequences is because it allows greater psychological need satisfaction. The satisfaction of the three basic psychological needs (autonomy, competence, and relatedness) promotes the innate tendency of human beings to seek for ways to extend themselves, to behave consistently with their true self, and to be proactive and engaged (Ryan & Deci, 2000). A few studies have examined how this innate proactive tendency is translated into concrete behaviours. For example, autonomous regulation for the environment was associated with the active search for information about environmental issues (Séguin, Pelletier, & Hunsley, 1998). Similarly, autonomous motivation in the politics domain led to the active seeking of factual information

about the political parties (Koestner, et al., 1996). Our findings extend these findings by showing that approach planning may represent a strategy that reflects active engagement in the regulation of behaviours, and that this active engagement is responsible for the positive consequences associated with autonomous regulation.

Our findings also mirror previous findings concerning the relationship between regulation styles and coping strategies. For instance, individuals with an autonomous orientation were found to use more active coping strategies when facing relationship problems, while individuals with a controlled regulation were found to have a tendency to use denial, and to disengage from the problems (Knee, Patrick, Vietor, Nanayakkara, & Neighbors, 2002). Thus, regulation styles seem to influence the choice of self-regulating strategies, whether they are associated with intimate relationships or eating behaviours.

Implications for Interventions

An investigation of the process through which regulation styles affect the outcomes of the regulation of eating behaviours is important for developing interventions. To date, studies suggest that one way to improve eating behaviours is to increase patients' autonomous regulation for eating behaviours through supporting their autonomy (Bellg, 2003; Williams, et al., 1996). Support of autonomy involves four main aspects: (1) acknowledging fully the perspective of the patient, (2) providing a meaningful rationale for the recommended actions, (3) providing choices, and (4) encouraging the patient to initiate actions (Deci, Eghrari, Patrick, & Leone, 1994). It was also suggested that interventions aimed at promoting autonomous regulation of eating behaviours may imply making women more aware of the reasons why they want to regulate their eating behaviours and encouraging them to reflect on these reasons (Pelletier & Dion, in press; Stice, Presnell, Groesz, & Shaw, 2005). The identification of food planning as a mediator that can be

changed suggests another mean through which we could intervene to increase women's success at the regulation of eating behaviours.

The mediational analyses in this research suggest that an intervention designed to teach women how to plan their eating behaviours in an approach manner could complement the recommended interventions based on increasing self-determination. Teaching women to think about what they will eat in terms of what they want to achieve is consistent with an emerging trend toward favoring approach-based strategies in treatment programs. Indeed, approach-oriented treatment programs for sexual offenders and alcohol abusers have been found to have advantages, such as greater engagement in treatment, over more traditional approaches focusing on avoiding and controlling risks (Cox, Klinger, & Blount, 1991; Mann, Webster, Schofield, & Marshall, 2004). Therefore, in the eventuality that our findings are replicated, we suggest that a possibly more effective intervention for preventing dysfunctional eating behaviours and promoting eating behaviours could be one that addresses both autonomous motivation and approach food planning.

Limitations

The current findings are limited by a number of factors. First, our data are correlational, so one must be careful about drawing causal inferences. We have to acknowledge the possibility that the data could fit an alternate model. For example, it is possible that women with bulimic symptoms tend to regulate their eating behaviours because they feel they have to in order to prevent further episodes of binge eating. This controlled regulation leads to planning with an emphasis on avoiding specific foods that trigger binge eating or on avoiding eating large portions. To obtain more solid evidence of the proposed sequence, future studies could examine the proposed relationship with a longitudinal design. Second, there is also the possibility that

omitted variables could explain both planning and eating behaviours. To that effect, future studies should control for potential confounding variables such as body dissatisfaction, social desirability, and dieting. Third, the Baron and Kenny (1986) approach to testing mediation has low statistical power (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). This method's limitation is less relevant to our study because we were able to detect significant mediation effects. However, we may have underestimated the mediating process. All the same, the Baron and Kenny approach has the advantages of being the most popular method for testing mediation processes and being very unlikely to lead to Type 1 error (MacKinnon, et al., 2002). Fourth, the statistical method used does not control for measurement errors. This again may have resulted in an underestimation of the effect of the mediator.

Notwithstanding these concerns, our research has important theoretical and practical implications. This research suggests that approach food planning should be favored over avoidance food planning. Further, this research established these different orientations in food planning as one of the mechanisms that accounts for the effect of regulations styles for eating behaviours on the development of healthy eating behaviours vs. dysfunctional eating behaviours.

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Footnotes

¹ The BMI divides weight by height ([weight (lbs) / height (in)²] X 703]. It serves as a valid measure of adiposity that is easy to use. The range of normal weight is situated at a BMI of 18.5 to 24.9. A BMI under 18.5 is considered underweight. A BMI of 25 and over is classified as overweight and a BMI of 30 and over is classified as obesity.

² Kenny et al.'s (1998) method consists of dividing the product of path a (link between the predictor and the mediator) and path b (link between the mediator and the outcome) by a standard error term, using this formula: $a \times b / \sqrt{b^2 sa^2 + a^2 sb^2 + sa^2 sb^2}$, where a and b are unstandardized regression coefficients of a and b and sa and sb are their standard errors. If the resulting z score of the mediated effect is greater than 1.96, then the effect is significant at the .05 level.

Table 1

*Descriptive Statistics and Confirmatory Factor Analysis Loadings for the Planning of Eating**Behaviours Items: Study 1*

Item	Mean	SD	Skewness	Kurtosis	Factor Loading
Easy and healthy meals to prepare when I anticipate a busy /stressful week	3.58	1.75	-.02	-1.05	.61
Which healthy restaurants I'll go	3.36	1.73	.11	-1.07	.60
New and healthy recipes I want to try	3.67	1.71	-.03	-.78	.57
The quality of food I will eat	4.71	1.44	-.76	.48	.61
The variety of food I will eat	4.41	1.50	-.49	.02	.68
New fruits and vegetables to introduce into meals	4.29	1.47	-.06	-.38	.63
On paper, a list of items to buy at the supermarket	4.39	1.94	-.33	-.98	.34
Specific times when I refrained from eating	3.22	1.70	.31	-.70	.54
Strategies to avoid overeating / snacking when I get bored	3.61	1.71	.04	-.74	.70
Ways to avoid temptations	3.56	1.64	-.01	-.61	.81
Strategies to avoid succumbing to fattening food	3.73	1.64	.02	-.59	.79
Not looking at the dessert selection at restaurants	3.00	2.04	.67	-.91	.61
A set of responses to be used when I encountered situations where I tend to overeat (parties, holidays)	2.62	1.60	.67	-.52	.66
Skipping a meal for a splurge later in the day	2.55	1.73	.91	-.07	.46

Table 2

Correlations between PEBS subscales and well-being scales: Study 1

	Approach food planning	Avoidance food planning
Vitality scale	.15*	-.25**
Psychological well-being scale	.14	-.23**
Autonomy subscale	.11	-.13
Mastery subscale	.05	-.25**
Personal growth subscale	.03	-.20*
Others subscale	-.05	.00
Purpose in life subscale	.06	-.05
Self-acceptance subscale	.21**	-.15

Note. **, $p < .00$; *, $p < .05$; Correlations with vitality are based on 238 participants.

Correlations with psychological well-being scale are based on 167 participants.

Others subscale= Positive relationship with others subscale

Mastery subscale = Environmental mastery subscale

Table 3

Descriptive Statistics and Correlations Among Variables: Study 2 (N= 198)

Construct	Mean	Std.	Skewness	Kurtosis	Range	2.	3.	4.	5.	6.	7.
1. Autonomous regulation	4.44	1.08	-.66	.96	1/7	-.04	.63**	.28**	.53**	.05	-.13
2. Controlled regulation	2.32	.85	.85	.38	1/7		.05	.45**	-.05	.55**	.56**
3. Approach planning	4.03	1.12	-.28	-.20	1/7			.39**	.55**	.12	-.08
4. Avoidance planning	3.19	1.22	.26	-.21	1/7				.26**	.59**	.44**
5. Healthy food choices	3.68	.80	-.32	-.53	1/5					.04	-.15*
6. Eating concerns	2.09	.72	.40	-.43	1/4						.79**
7. Bulimia symptoms	2.02	.64	.91	-.13	1/5						

Table 4

Mediation of the Relationship Between Autonomous Regulation and Healthy Food Choices by Approach Food Planning: Study 2

Variables	B	SE B	95% CI ^a	β	Mediation test ^b
Step 1					
Autonomous regulation	.39	.04	.31 / .48	.54**	
Step 2					
Autonomous regulation	.25	.05	.14 / .35	.34**	3.98**
Approach planning	.24	.05	.13 / .34	.33**	

a. 95%CI = 95% confidence interval

b. mediation test gives a z score of the mediated effect; $z > 1.96$, $p = .05$

Table 5

Mediation of the Relationship Between Controlled Regulation and Bulimic Symptoms by Avoidance Food Planning: Study 2

Variables	B	SE B	95% CI	B	Mediation test ^b
Step 1					
Controlled regulation	.40	.05	.31 / .49	.53**	
Step 2					
Controlled regulation	.32	.05	.22/ .42	.42**	2.75**
Avoidance planning	.12	.04	.05/ .19	.22**	

a. 95%CI = 95% confidence interval

b. mediation test gives a z score of the mediated effect; $z > 1.96$, $p = .05$

Table 6

Mediation of the Relationship Between Controlled Regulation and Eating Concerns by Avoidance Food Planning: Study 2

Variables	B	SE B	95% CI	B	Mediation test ^b
Step 1					
Controlled regulation	.47	.05	.37 / .57	.55**	
Step 2					
Controlled regulation	.30	.05	.20 / .40	.35**	5.2**
Avoidance planning	.26	.04	.19 / .33	.44**	

a. 95%CI = 95% confidence interval

b. mediation test gives a z score of the mediated effect; $z > 1.96$, $p = .05$

Running Head: AUTONOMY AND IMPLEMENTATION INTENTIONS

Autonomous Motivation Moderates the Relation between Implementation Intentions on Wanted
Responses vs. on Unwanted Responses and Goal Attainment

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Abstract

Previous research (R. Koestner, Lekes, Powers, & Chicoine, 2002) has shown that autonomous goal pursuit and implementation intentions combined synergistically for optimal progress at personal goals. This study extended this result by investigating the interdependent effects of two types of implementation intentions (on Wanted Responses (WR) or on the Suppression of Unwanted Responses (SUR)), as well as their interaction effects with autonomous regulation (vs. controlled regulation) on body weight goal attainment. Results revealed that autonomous regulation of eating behaviours was a positive predictor of goal attainment after 1 month. Results also indicated that, compared to the SUR, the WR intervention led to more goal attainment as autonomous regulation increased.

Autonomous Motivation Moderates the Relation between Implementation Intentions on Wanted Responses vs. on Unwanted Responses and Goal Attainment

Implementation intentions consist of simple plans that specify the when, where, and how of goal pursuit (Gollwitzer, 1999). Several studies have found that asking participants to add implementation intentions to their goal intention increased significantly their chance of attaining their goal (Armitage, 2004; Orbell, Hodkins, & Sheeran, 1997; Orbell & Sheeran, 2000). A unique aspect of implementation intentions is the way the plan is formulated. Implementation intentions take the general structure of a contingency, where an anticipated situation is linked to a specific goal-directed action (i.e., “When situation x arises, then I will perform behaviour y ”). Looking at it at a more specific level, the anticipated situation can be an opportunity that is linked to a wanted behaviour (wanted responses-oriented implementation intentions). The anticipated situation can also be a critical situation that is linked with the suppression of an unwanted behaviour (suppression-oriented implementation intentions) (Gollwitzer, Fujita, & Oettingen, 2004).

The answer to why implementation intentions facilitate goal pursuit resides in its particular structure. The fact of having selected a situation activates the mental representation of this situation. Consequently, this situation is more accessible, and thus more easily detected, and more likely to be recalled (Aarts, Dijksterhuis, & Midden, 1999). Individuals’ perceptual readiness for the situation, makes them less likely to miss it because they forgot, they were tired, they were distracted, or they were preoccupied with other goals. Moreover, because the situation is mentally connected to a specific action, simply activating the situation will automatically lead to the action. When the situation is encountered, the response is performed efficiently, rapidly, and demands less consciousness.

Several factors have been found to affect the strength of the beneficial effects of implementation intentions. For example, implementation intentions have maximal effectiveness when an individual is strongly committed to the goal, intends strongly to pursue the goal, and perceives the goal as difficult to initiate (Gollwitzer & Brandstätter, 1997; Orbell, et al., 1997; Sheeran, Webb, & Gollwitzer, 2005). Most relevant for the present investigation are the two studies conducted by Koestner and his colleagues on weekend goal progress and on monthly progress on New Year's resolutions (Koestner, Lekes, Powers, & Chicoine, 2002). Participants in the implementation condition were instructed to think about a time and a place that would represent a good opportunity to engage in goal-related action. Then participants were asked to think about three distractions that they could encounter when pursuing their goal and to link each of these distractions to a counter-strategy. Participants wrote down these three pairs of distraction/strategy in the if-then format. The results showed that implementation intentions are more effective in facilitating goal progress when individuals are pursuing a goal that is self-concordant, that is a goal that fits with their values and personal interests versus a goal that reflects impositions from others or from one self.

Thus, Koestner and his colleagues (2002) provided strong evidence that optimal goal progress is observed when an autonomous motivation for the goal pursuit (self-concordance) is combined with a planning strategy (implementation intentions). Despite this great contribution, these findings are limited by a number of methodological concerns. One of the concerns is that the goals set by the participants differed significantly in terms of their specificity and their content (e.g., eat more fruits versus have better eating habits; health related goals, school related goals, and time management goals). This variability in participants' goals can make the interpretation of goal progress difficult since progress at one type of goal may be more difficult

compared to other types of goals. For example, the goal to stop smoking may be more difficult to achieve than the goal to be more patient, and the goal to eat five portions of fruits and vegetables each day may be less difficult than the goal to improve one's eating habits. Also, the content of goals can influence the extent to which they can be pursued for autonomous reasons. For example, intrinsic aspirations (e.g., affiliation, personal growth, community contribution) tend to be pursued for autonomous reasons while extrinsic aspirations (e.g., attaining wealth, fame, and image) tend to be pursued for non autonomous reasons (Sheldon & Kasser, 1995). Finally, these studies did not discern the effect of formulating implementation intentions on wanted responses (WR) versus implementation intentions on the suppression of unwanted responses (SUR) on goal progress.

Therefore, the main goal of the present study was to improve on the methodology of Koestner et al. by focusing on a specific goal (body weight goal), and by assessing goal progress using a goal attainment index. This index assesses the extent to which women attain their body weight goal they had set for themselves. Also, the present study extended the Koestner et al. findings by determining and comparing the effectiveness of the two types of implementation intentions (WR and SUR) for goal success and by examining whether they were moderated by participants' motivational orientation.

Autonomous and Controlled Motivation

According to self-determination theory, the pursuit of goals may be achieved through two main types of motivation (Deci & Ryan, 1985; 2002). The first type is autonomous motivation, which refers to the pursuit of an activity with a true sense of ownership, and choice because the activity is personally valued, reflects one's self-definition, or is inherently satisfying. The second type is controlled motivation, which refers to the pursuit of an activity out of self-

imposed pressure (i.e., motivated by guilt, shame, sense of worthiness) or external pressure (e.g., other people, society in general, rewards). The distinction between autonomous motivation and controlled motivation is functionally important. Autonomous motivation has not only been associated with more positive experiences and more positive outcomes (greater persistence, better performance, greater well-being) than controlled motivation, but controlled motivation has been associated with undesirable outcomes such as anxiety, denial, and conflicted emotions (Deci & Ryan, 2000; 2002).

Past research has examined autonomous and controlled motivation at different levels of generality (Vallerand, 1997; Vallerand & Ratelle, 2002). Motivation at the global level reflects a general tendency or disposition to engage in the different activities in life either in an autonomous or controlled way (Why do you do things in general?). Motivation at the contextual level refers to individuals' motivational orientation for a specific life domain (Why do you practice sport?, Why do you go to school?). Motivation at the situational level refers to individuals' motivational orientation at a specific moment in time (Why do you do this activity right now?). Similarly, motivation at the goal level represents why individuals pursue their goal (Sheldon & Elliot, 1998). The level of generality at which motivation is assessed depends on the research question.

The research question in Koestner et al.,'s study was "Do differences in motivational orientation affect the extent to which an implementation intentions exercise is useful to improve progress at New Year's resolutions?" We can infer that they chose to measure motivation at the goal level because New Year's resolutions represent goals people set for themselves and they can be related to different life contexts. Our research question in this study was "Do differences in motivational orientation affect the extent to which an implementation intention exercise is useful

to improve eating habits and to attain one's body weight goal?" Because we were interested in predicting consequences directly related to the regulation of eating behaviour, we chose to focus on contextual motivation for the regulation of eating behaviour.

Wanted Responses-Oriented and Suppression-Oriented Implementation Intentions

Past research has examined two types of implementation intentions. The first type is implementation intentions on WR and it links a good opportunity to act with a desired behaviour. Examples for the goal of healthy eating are "Every morning, I will eat a fruit", and "Every Sunday, I will try a new healthy recipe". The second type is implementation intentions on the SUR and it links an anticipated critical situation that may elicit an unwanted behaviour with a specific action to suppress the unwanted response. For example, individuals wanting to eat less chocolate can anticipate that they will have cravings for chocolate. In order to suppress the behaviour of eating chocolate, individuals can specify not to perform the unwanted behaviour (i.e., "If I have a craving for chocolate, I will not succumb."), to ignore the unwanted behaviour (i.e., "If I have a craving for chocolate, I will ignore it."), or to perform an antagonistic response (i.e., "If I have a craving for chocolate, I will eat a fruit.").

The two types of implementation intentions target different self-regulatory problems. Since implementation intentions on WR specify how to pursue the goal they were found to be especially helpful for the initiation of goal-directed actions (Gollwitzer, 1999). Implementation intentions on WR were also found to be helpful for staying on track since what to do is exactly planned out so people are less affected by aversive mood (e.g., tired, negative emotions) and unwanted unanticipated influences (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Gollwitzer & Bayer, 2000). On the other hand, suppression-oriented implementation intentions help individuals deal with anticipated critical situations thought to interfere with the goal pursuit.

Thus, theoretically, forming both types of implementation intentions would assure maximal protection from self-regulatory problems and would lead to higher goal success. Indeed, attainment of most goals necessitates the initiation of new behaviours (e.g., eat more fruits and vegetables) and the suppression of old habits (e.g. eat less food high in cholesterol).

The combination of the two types of implementation intentions in an intervention is based on the assumption that both types are effective in promoting goal attainment; an assumption that was never questioned or tested before. While support for the effectiveness of the implementation intentions on WR is quite strong (for a meta-analysis see Koestner et al., 2002), it remains important to examine whether implementation intention on the SUR is also effective in the context of persistent self-regulation in natural settings, when people encounter repetitively many critical situations. The few studies about implementation intentions on SUR have examined its effectiveness for specific laboratory tasks. For example, implementation intentions on SUR were found to prevent distractions from interfering with the performance of a task (Gollwitzer & Schall, 1998) and to prevent the automatic activation of stereotypical beliefs and prejudiced evaluations (Gollwitzer, Achtziger, Schaal, & Hammelbeck, 2002).

The Present Study: Objectives and Hypotheses

The first purpose of the present study is to determine and to compare the effectiveness of implementation intentions on WR and on SUR for body weight goals. We expect that implementation intentions on WR and the SUR will lead to more goal attainment compared to the control condition. Because implementation intentions on WR serve to reinforce the goal pursuit against any adverse situations (i.e., expected or unexpected), we also hypothesize that implementation intentions on WR will be more useful to goal attainment compared to implementation intentions on SUR.

The second purpose of this study is to examine whether the effectiveness of implementation intentions on WR and the SUR will be moderated by motivational orientation. Past studies have found that autonomous regulation of eating behaviours is associated with more weight loss (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004; Williams, Grow, Freedman, Ryan, & Deci, 1996). Thus, we expect a main effect for autonomous motivation, indicating that women with higher levels of autonomous regulation will be more successful at attaining their body weight goal. Next, we hypothesize that autonomous motivation for eating behaviours will moderate the relationship between implementation intentions on WR and body weight goal attainment, such that implementation intentions on WR is expected to lead to higher goal attainment as levels of autonomous motivation increase. All the above hypotheses will also be tested with other measures of success (i.e., healthy food choices, reported success).

The third purpose of this study was to examine specific measures of negative outcomes related to the regulation of eating behaviours (i.e., food concerns). Past studies have found that controlled regulation is linked to dysfunctional eating behaviours (Pelletier, et al., 2004; Pelletier & Dion, in press). Based on these studies, we predict that controlled regulation will lead to more eating concerns.

Method

Participants and Procedures

Participants were 47 University of Ottawa female students who took part in the study in exchange for course credit. First, participants completed the Regulation of Eating Behaviours Scale in a larger questionnaire that was distributed in the introduction to social psychology undergraduate courses. Participants then received a sheet of paper describing a study about women's eating behaviours. In the study's description, it was clearly stated that they were

eligible to sign up for this study only if they were female and they were currently trying to regulate their eating behaviours in order to maintain or lose weight. Participants were informed that participation in this study involved attending two laboratory sessions of 20 minutes where they would be weighed and measured.

Participants were randomly assigned to the Wanted Response implementation (WR), the Suppression of Unwanted Responses implementation (SUR) or to a control condition. At the first laboratory session, participants in all conditions received the Canada's Food Guide for Healthy Eating for nutritional information purposes. All of the participants were individually seated in a small room with a desk. Then, they were instructed to create a personal code to ensure their anonymity. They were also asked to specify their body weight goal and to complete a questionnaire assessing their perception of the regulation of eating behaviours, and their food choices. Participants in the two implementation conditions completed an additional section asking them to form context-specific plans and to write them down. After completing the questionnaire, participants were asked to remove their shoes and step on a TBF-531 body fat monitor/scale to assess their weight and their percentage of body fat. Participants were asked to stand straight with their heels and buttocks against the stadiometer for height measurement. Finally, it was recommended to participants that they sign up for the second session at the same time of day in order to obtain a more precise assessment of their weight change.

One month later, all participants returned to the laboratory to complete a follow-up questionnaire, assessing their perception of the regulation of their eating behaviours, their food choices, and their food concerns. Again, participants were weighed and measured.

Instruments

Intentions about the regulation of eating behaviours (Pelletier et al., 2004; See Appendix C). Participants were asked to what extent they intended to regulate their eating behaviours in the future, and to what extent they were trying to regulate their eating behaviours. Participants indicated their answer on a 7-point Likert scale ranging from 1 (Not at all) to 7 (Very much intend /Trying very hard).

Regulation of Eating Behaviors Scale (REBS; Pelletier et al., 2004; See Appendix C). This scale, based on the self-determination theory (Deci & Ryan, 1985; 2002), measures intrinsic motivation, four types of extrinsic motivation (i.e., integrated regulation, identified regulation, introjected regulation, and external regulation) and amotivation. The 6 subscales are composed of 4 items each, for a total of 24 items. Each item represents possible reasons why people might try to regulate their eating behaviours. Participants indicated the degree to which the proposed reasons corresponded to their reasons on a 7-point Likert scale ranging from 1 (Does not correspond at all) to 7 (Corresponds exactly). We computed a composite score to represent autonomous motivation (the sum of the intrinsic motivation, integrated regulation and identified regulation subscales) and controlled motivation (the sum of the introjected regulation, external regulation, and amotivation subscales).

Specification of a body weight goal (See Appendix D). Participants were asked to put a specific number or 0 on the dash in this following sentence: "I intend to lose ____ lbs in the next month

Body weight goal attainment index. This index was calculated by subtracting each participant's weight change between T1 and T2 from the body weight goal they had set for themselves at T1. For example, if a woman had the body weight goal to lose 5 pounds and she actually lost 4 pounds, then a body weight goal attainment index is negative one; $[(-5) - (-4) = -1]$.

The body weight goal attainment index can also be positive if the woman lost more than she wanted; $[(-5) - (-6) = 1]$. A body weight goal attainment index of 0 represents perfect goal attainment.

Body Mass Index (BMI). The BMI takes into account both a person's height and weight and is calculated using this mathematical formula: $[(\text{weight (lbs)} / \text{height (in)}^2) \times 703]$. A BMI below 18.5 is considered underweight, and a BMI of 18.5 to 25 is representative of normal weight. BMIs of 25 to 30 are generally considered overweight while a BMI over 30 is generally considered as obese.

Reported Success (Pelletier et al., 2004; See Appendix C & E). To assess success before the intervention and after the intervention, participants were asked: "Do you consider yourself successful in the way you regulate your eating behaviours?" Participants were asked to indicate their answer on a 7-point Likert scale ranging from 1 (Not at all successful) to 7 (Very successful).

Implementation intention manipulation (See Appendix D). The general instruction regarding the formation of implementation intentions is based on the classic study performed by Gollwitzer and Brandstätter (1997). In both implementation intentions conditions, participants were first informed about the beneficial impact of planning (Milne, Orbell, & Sheeran, 2002). Participants read the following:

Successful regulation of eating behaviours requires that one initiates and maintains various goal-directed actions (e.g., eat more fruits, eat less fat). Food planning has been found to facilitate the enactment of these actions. Food planning is essential to meet daily requirements and protect you from out-of-control eating (Herrin, 2003).

Then, participants were instructed to make 5 simple plans that each links a situation with a response (i.e., “when situation x occurs, I will respond with y ”). In the implementation intentions on WR, participants were told the following:

It would be useful for you to list 5 good opportunities to act toward goal attainment. Then list a specific wanted action to initiate in the presence of each opportunity.

Participants were provided with five examples of implementation intentions on WR, such as: Each day, I will eat five servings of fruits and vegetables. In the implementation intentions on SUR, participants were told the following:

It would be useful for you to list 5 critical situations that may elicit unwanted behaviours (behaviours that will not make you progress toward your goal). Then, specify how you will react (either intending not showing the unwanted behaviour, by ignoring the critical situation and by specifying a counter-behaviour).

Participants were provided with five examples of implementation intentions on SUR, such as: “When I am studying and bored, I will drink water instead of soft drinks”. Finally, participants were asked to visualize the situation and the specified response. Participants were given a copy of their written implementation intentions and were advised to post this sheet of paper where they will see it often so they would remember to use them.

Healthy Eating Habits Scale (Pelletier et al., 2004; See Appendix D & E). This scale measures participants’ food choices according to the recommendations made by the Canada’s Food Guide for Healthy Eating. This 8 item-scale has two subscales, each with 4 items. The two subscales are: healthy foods (e.g., “I eat vegetables, fruits, and grain products”) and foods that should be eaten with moderation (e.g., “I eat foods such as chips, chocolate, and candies”).

Participants indicated the extent to which they eat the different foods described in the items on a scale ranging from 1 (“Not at all”) to 5 (“All the time”).

The Eating Disorder Examination-Self Report Questionnaire (EDE-Q; Fairburn & Beglin, 1994; See Appendix E). We used 6 items from this scale: the *weight fluctuation* item (“Would a weight fluctuation of 5 lbs. affect the way you live your life?”), the *splurge alone* item (“Do you eat sensibly in front of others and splurge alone?”), the *food thoughts* item (“Do you give too much time and thoughts to food”), the *guilt after overeating* item (Do you have feelings of guilt after overeating?), the *eating consciously* item (“How conscious are you of what you’re eating?”); and the *fear of losing control* item (“Do you fear loss of control over eating?”). Participants were asked to circle one of the 4 answers (1-Never; 2-Rarely; 3-Often; 4-Always).

Questions specific to the implementation conditions (See Appendix E). Participants in the implementation conditions were asked the following question: a) How often did you use the strategies listed in the last questionnaire (5-point answer scale ranging from 1= Not at all to 5= Very often).

Results

Descriptive Statistics and Correlations

The mean BMI for our sample at Time 1 was 22.82 kg/m (SD= 4.14; range 15.64-44.04). Based on the recommended BMI thresholds, 4.2% of our participants classified as underweight, 76.9% as normal weight, 16.8% as overweight, and 2.1% as obese. Participants’ body weight goal ranged from wanting to maintain their current weight to lose 20 lbs ($M= 6.23$ lbs; $SD= 4.23$). Between Time 1 and Time 2, weight change ranged from losing 6.50 lbs. to gaining 4.50 ($M= -.33$ lbs., $SD= 2.41$). The mean goal progress ($M= -5.95$; $SD= 4.64$; range -17.50 to 3.00) indicated that on average participants did not attain their body weight goal. Regarding the implementation manipulations, participants tended to generate their own strategies instead of

simply copying the examples provided (see Appendix for examples of WR and SUR strategies). Participants in the implementation conditions reported using sometimes their strategies (WR: $M = 3.18$; SUR: $M = 2.80$), $t(30) = 1.34$, $p = .19$.

The means, standard deviations, and correlations among all variables used in subsequent analyses are reported in Table 1. Participants reported to a greater extent autonomous motivation for the regulation of eating behaviours than controlled motivation. A small increase in healthy food choices was observed between time 1 and time 2, $t(46) = -2.59$, $p = .013$. Significant correlations of particular interest are that autonomous motivation was correlated positively with food choice at Time 1 and Time 2, and with eating consciously. Also, controlled motivation was positively correlated with various variables representing eating concerns. Finally, the BMI at time 1 correlated negatively with goal progress.

Main Analyses

Prior to testing our hypotheses, a MANOVA was conducted in order to verify that initial score on success at the regulation of eating behaviours, intentions to regulate eating behaviours, and the extent to which participants were trying to regulate their eating behaviours were equivalent across the three experimental groups. The multivariate test was non significant $F(3, 47) = .44$, $p = .85$. Simultaneous multiple regressions were conducted to test our hypotheses. As a first step, the experimental conditions were represented with code variables. Contrast coding was used because it allows making comparison between specific groups and it reduces the possibility of rejecting false null hypotheses (Cohen, Cohen, West, & Aiken, 2003). Because, there were three experimental conditions in this study, it was necessary to form two contrast codes. The first contrast code compared the means of each intervention group with each other (WR = 1; SUR = -1; Control = 0). The second contrast code compared the mean of each intervention with the mean of the control group (WR = 1; SUR = 1; Control = -2). In the

following analyses, the same basic model was used with different dependant variables. This basic model was composed of the experimental conditions (contrast code 1, contrast code 2), autonomous regulation, controlled regulation, the autonomous regulation X conditions interactions (autonomous regulation X contrast code 1; autonomous regulation X contrast code 2), and the controlled regulation X condition interactions (controlled regulation X contrast code 1; controlled regulation X contrast code 2). All predictors used in the simultaneous multiple regressions were centered (i.e., set to mean to zero). Significant interaction effects were investigated with simple slope analyses (Cohen et al., 2003).

Body Weight Goal Attainment

Preliminary analyses revealed that the Body Mass Index (BMI) at Time 1 was a significant predictor of body weight goal attainment. Therefore, the BMI-T1 was included in the basic model for this specific dependant variable. The regression of body weight goal attainment on the basic model revealed a main effect for the BMI ($\beta = -.57$), $t(1, 46) = -4.78$, $p = .00$, indicating that participants with higher BMI before the study were less successful in achieving the goal they had specified for themselves.¹ This analysis also revealed a main effect for, autonomous regulation ($\beta = .27$), $t(1, 46) = 2.16$, $p = .04$, such that autonomous regulation was associated positively with goal attainment. In other words, as participants' level of autonomous regulation increased, they were more likely to achieve their own personal weight loss goal.² Of importance, the autonomous regulation X contrast code 1 interaction was significant, $\beta = .28$, $t(1, 46) = 2.41$, $p = .02$. The interaction is depicted in Figure 1, which plots the regression of goal attainment on the experimental conditions at one standard deviation above and below the mean of autonomous regulation. Simple slope analyses showed that autonomous regulation was a moderator for the WR condition, $t(47) = 2.17$, $p < .05$, but was not a significant moderator for the SUR condition, $t(47) = -1.12$, Ns . This result suggests that the positive relation between the WR

condition and goal attainment increases as autonomous regulation increases. When autonomous regulation is low, the WR condition has little effect. However, when autonomous regulation is high, the WR condition leads to the highest levels of goal attainment. No other results approached conventional levels of signification ($ps > .11$).

Food Choices

To account for participants' food choices before the study, food choices measured at Time 1 was added in the basic model. The regression of food choices at Time 2 on the basic model revealed a main effect for food choices at Time 1, $\beta = .54$, $t(1, 46) = -4.39$, $p = .00$. Thus, food choices before the study strongly predicted food choices one-month later. This analysis also revealed that autonomous motivation had a positive influence on food choices one-month later, $\beta = .32$, $t(1, 46) = 2.59$, $p = .01$. No other results approached conventional levels of signification ($ps > .32$).

Reported Success at the Regulation of Eating Behaviours

Reported success measured at Time 2 was regressed on the basic model while controlling for reported success measured at Time 1. This analysis revealed that reported success at the regulation of eating behaviours one-month after the intervention was positively predicted by success prior to participating in this study, $\beta = .34$, $t(1, 46) = 2.41$, $p = .021$, and by autonomous motivation, $\beta = .32$, $t(1, 46) = 2.23$, $p = .03$. No other results approached conventional levels of signification ($ps > .12$).

Eating Concerns

The basic model was tested with different dependant variables representing eating concerns. When *weight fluctuation* was used as the dependant variable, the regression analysis revealed no significant effect. For *splurge alone*, the analysis revealed that controlled motivation

was a positive predictor of $\beta = .50$, $t(1, 46) = 3.19$, $p = .00$. For *food thoughts*, the analysis revealed that the controlled regulation X contrast code 2 interaction was marginally significant, $\beta = .34$, $t(1, 46) = 1.99$, $p = .05$. As can be seen in Figure 2, this unexpected interaction suggests that in the control condition, food thoughts decreased with higher levels of controlled regulation. For *guilt after overeating*, the analysis revealed that controlled motivation was a positive predictor, $\beta = .57$, $t(1, 46) = 4.32$, $p = .00$, and the contrast code 2 was approaching significance, $\beta = .23$, $t(1, 46) = 1.83$, $p = .075$, indicating more guilt in the intervention conditions than the control condition. For *eating consciously*, the analysis revealed that autonomous motivation was a positive predictor, $\beta = .51$, $t(1, 46) = 3.63$, $p = .00$, and that contrast code 2 was a positive predictor, $\beta = .29$, $t(1, 46) = 2.05$, $p = .047$, indicating that participants in both intervention conditions ate more consciously than in the control condition. For *fear of losing control*, this analysis revealed a positive main effect for the controlled motivation, $\beta = .39$, $t(1, 46) = 2.54$, $p = .02$.

Discussion

Two major lines of research are discernable in the self-regulation literature: motivation and self-regulatory strategies. A substantial amount of studies have documented that autonomous motivation leads to better outcomes than controlled motivation (Deci & Ryan, 2002 for a review). Also, a number of studies have supported the effectiveness of a simple planning strategy referred to as implementation intentions (Gollwitzer, 1999). A first study by Koestner et al. (2002) attempted to bridge these two lines of research by examining the interaction between motivation and implementation intentions for the prediction of goal progress for New Year's resolutions. Findings from this study revealed that there was a tendency for the beneficial effects of implementation intentions to increase as autonomous motivation increased.

The present study attempted to further our understanding of the impact of forming implementation intentions, as well as the interaction between implementation intentions and autonomous motivation. This study extended past findings by examining specifically body weight goals among women who were trying to lose weight or maintain weight. We also examined separately the effect of two implementation intentions instructions: one asking participants to form implementation intentions on wanted responses (WR), and one asking participants to form implementation intentions on the suppression of unwanted responses (SUR). The first purpose of this study was to determine and compare the effectiveness of implementation intentions on WR and on the SUR for a body weight goal. Our findings suggested that both implementation intentions interventions alone did not have a positive impact on body goal attainment, on food choices, and on reported success. Indeed, participants who were exposed to either intervention did not experience more success at their body weight goal nor did they report more success at the regulation of eating behaviours or making more healthy food choices, than participants who were assigned to the control condition. Moreover, we did not find support for the hypothesis (with all measures of success) that formulating implementation intentions on WR leads to more success at a body weight goal than formulating implementation intentions on SUR.

The second purpose of this study was to examine whether the impact of the implementation intentions interventions on body weight goal attainment is moderated by motivational orientation. As expected, our findings also revealed that autonomous motivation plays an important role in the explanation of attainment of a body weight goal, healthy food choices and reported success. In line with our hypotheses, we also found an interaction effect between types of implementation intentions and autonomous regulation on body weight goal

attainment. More specifically, implementation intentions on WR were beneficial when levels of autonomous motivation were high.

The third purpose of this study was to examine the impact of regulation styles, interventions, and their interaction on negative outcomes associated with the regulation of eating behaviours. As expected, controlled motivation for the regulation of eating behaviours was found to be associated with maladaptive food thoughts (i.e., fear of losing control; guilt after overeating) and behaviours (i.e., splurge alone). Finally, we found a marginally significant interaction between controlled regulation and the control condition for food thoughts, such that as levels of controlled regulation increased (that is more external and amotivated and less introjected), the amount of time and thoughts allowed to food decreased. Because participants with high levels of controlled regulation do not possess a real sense of purpose, they may be more passive about the regulation of eating behaviours and therefore are less preoccupied with food. Inversely, participants with low levels of controlled regulation may spend too much time and thinking about food because they are sufficiently invested in the regulation of eating behaviours but they have conflicted emotions about this goal pursuit.

Importance of Autonomous Regulation

This study underlined the importance of autonomous regulation in the prediction of goal attainment. Autonomous regulation was found to impact positively body weight goal attainment in two ways: on its own and together with implementation intentions on WR. Thus, body goal attainment was more likely if women were high in autonomous regulation and it was most likely if women high in autonomous regulation were instructed to form implementation intentions on WR. Moreover, autonomous regulation for eating behaviours accounted for healthy food choices one month after the first session even when controlling for their past eating habits. This finding

indicates that for women with higher levels of autonomous regulation, receiving nutritional information and participating in a study where there was a follow-up session was sufficient to bring them to improve their eating habits.

Lack of a Main Effect for Implementation Intentions

An unexpected finding that merits our attention concerns the lack of a main effect for implementation intentions. It should be noted that most studies that examined goal progress after a 1-month interval did not find a main effect for the implementation intentions manipulation (Koestner et al. (2002); Study 2; Powers, Koestner, & Topciu, 2005; Study 1 & 2). As suggested by Powers and his colleagues, it may be that consequences observed relatively long after the implementation intentions were formulated are less substantial than when the consequences are measured sooner after the intervention. This explanation makes sense since the bulk of the research that documented the positive effects of implementation intentions has used shorter intervals (i.e., from same day to 2 weeks). While we did not find a main effect for the two implementation conditions on body weight goal attainment, we found that these experimental conditions had some effect on other variables. First, we found that both types of implementation intentions led participants to eat more consciously. Second, we found that participants in both conditions had a tendency toward feeling more guilt after overeating. Thus, these results suggest that both interventions influenced participants in some ways.

Interaction between Autonomous Regulation and Types of Implementation Intentions

A main contribution of this study is the finding that for participants high in autonomous motivation, implementation intentions on WR increased goal success, whereas implementation intentions on the SUR did not. These results contribute to the existing literature. Many moderators have been found to affect the strength of the beneficial impact of implementation

intentions (e.g., difficult goals). Further, strong intentions have been found to be necessary for the beneficial effect of implementation intentions to occur (Sheeran, et al., 2005). Our results go beyond this last finding by suggesting that even strong intentions are not sufficient to observe the beneficial impact of implementation intentions. It appears that participants with different levels of autonomous regulation and controlled regulation have usually strong intentions to pursue their goal (Deci & Ryan, 2002). Thus, it seems that in order to gain from implementation intentions (i.e, those focused on wanted responses), individuals need to not only have strong intentions to pursue their goal but they need to pursue their goals for motives that are highly autonomous.

We propose two reasons why implementation intentions on WR may be more effective as levels of autonomous regulation increase. First, as suggested by recent research (Otis & Pelletier, 2006) implementation intentions on WR are overall a more effective planning strategy and thus by combining it with high levels of autonomous regulation (the most optimal type of regulation) it leads to the greatest success. As discussed in the introduction, the literature on implementation intentions postulates that planning wanted responses is effective for the initiation of directed-action and to secure a goal from unanticipated situations. The distinction between implementation intentions on WR and on the SUR reminds us of the distinction between approach and avoidance regulation. Avoidance regulation is less effective than approach regulation. According to Carver and Scheier (1998), people often engage in both approach and avoidance processes when they pursue a goal. However, the engagement in only avoidance regulation is less effective since it motivates people to get the furthest from an undesired state but does not provide a positive outcome to keep them from wandering aimlessly without a clear direction. Thus, our findings suggest that, like avoidance goals, an avoidance orientation at a more concrete level (i.e., planning of actions) is also non-optimal. While there is also evidence

that avoidance goals (e.g., to stop eating too much) lead to negative outcomes, in general we did not find that implementation intentions on the SUR are detrimental to the goal pursuit or to well-being (Elliot, Sheldon, & Church, 1997). A very probable reason why implementation intentions on SUR did not lead to negative outcomes is that they target one specific critical situation to avoid and stipulate what to do about this situation, and thus provide a direction.

The second reason why implementation intentions on WR increased goal success, is that implementation intentions on WR and autonomous motives are more coherent. Indeed, deciding how to eat healthy is coherent with personally wanting to regulate one's eating behaviours because it reflects one's deep values, needs, and interest. Conversely, deciding how to prepare for critical situations is more coherent with a controlled regulation based on external reinforcements instead of on a desire representing the authentic self. Past studies have found support for these propositions. For example, women with an autonomous regulation for eating behaviours are more concerned about the quality of foods, while women with a controlled regulation are more concerned by the quantity of food (Pelletier, et al., 2004). Also, women with autonomous regulation for eating behaviours were found to have healthy eating habits partly because they plan for the inclusion of healthy foods (Otis & Pelletier, 2006). Thus, it is not unexpected that women with high levels of autonomous regulation who are taught ways to formulate more specific plans about good opportunities to eat healthy experience even more success at the regulation of their eating behaviours.

Implications

These findings have theoretical implications for self-determination theory as well (Deci & Ryan, 1985; 2002). On the avoidance and approach distinction, Deci and Ryan (2000) argued that there is not a perfect correspondence between avoidance processes and controlled regulation

and approach processes and autonomous regulation. For example, a person can have an avoidance goal (i.e. stop smoking) and feel totally autonomous toward that goal. However, they conceded that autonomous behaviours tend to be approach-oriented and that controlled behaviours tend to be avoidance-oriented (Deci & Ryan, 2000). Our findings support the idea that autonomous individuals tend to pursue a goal in an approach manner. In fact, our findings indicate that teaching people with high autonomous regulation approach-based plans leads them to have more success. Thus, it seems that teaching individuals to behave like they naturally tend to (autonomous individuals tend to behave in an approach manner) amplifies the relation found between autonomous regulation and healthy eating behaviours.

This study was also the first to disentangle the effects of implementation intentions on WR and the SUR for a relatively long-term self-regulatory goal. This study provides evidence that should caution researchers against combining both types of implementation intentions together before we know more about their independent effects. This study suggests that implementation intentions on WR are better than implementation intentions on the SUR. Future studies are needed to replicate this finding with different samples and in different contexts. It would be also important to examine whether using implementation intentions on WR alone is better than using both implementation intentions on WR and the SUR.

Limitations

Several limitations of the present study should be noted. While we focused on one type of goal (i.e., body weight goal), participants had either the goal to lose weight or to maintain their weight. The goal to lose weight could imply different processes and could have differently benefited from planning than the goal to maintain weight. Second, our sample consisted mostly of women who had already healthy body weights at the beginning of the experiment. This

means that our participants were already successful in achieving a healthy body weight. However, it also reflects the reality; most women want to lose weight even if they have no health reasons to do so. Further, one could argue that it is harder to lose the last few pounds or to maintain weight loss. Third, our findings were obtained with a sample of university women with a body weight goal. These results may not generalize to other samples or in relation to the attainment of other goals.

Still, this study provided further evidence that autonomous regulation has an influence on the effectiveness of implementation intentions. Further, this study underscores the necessity of examining in more detail the various forms of implementation intentions. While evidence for the general effectiveness of implementation intentions abound, our study suggests that a closer investigation of the types of implementation intentions and of individual differences is important to direct individuals' time and energy toward the strategy that works the best for them.

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Appendix

Examples of implementation intentions on Wanted Responses (WR) and on the Suppression of Unwanted responses (SUR) listed by participants.

SUR

When I get a chocolate craving, I will moderate my intake.

When I am at the movie theatre, I will not eat popcorn.

When I am eating at a restaurant, I will not order an appetizer (only a main course) and I will drink an herbal tea for desert.

When I feel like eating junk food, I will think twice before giving in.

When I come back from the gym, I will eat a small healthy snack (apple & yogurt for example).

When I have a course early in the morning, I will get up earlier to eat a healthy breakfast.

For dessert, I will eat fruits instead of a dessert high in calories.

When I get home late, I will make something healthy and easy to prepare such as pasta.

When I am out of food, I will go grocery shopping (instead of eating out).

WR

Each day, I will drink at least 1 liter of water.

At breakfast, I will vary my fruit choices (not only bananas!).

Two to three times a week, I will substitute meat with fish or tofu.

Each day, I will consume healthier fats and less saturated and trans fats.

At restaurants, I will eat salads with dressing on the side.

At each meal, I will eat the right amount of protein.

Every weekday, I will pack a low fat lunch.

Each day, I will eat 2 to 4 dairy products.

Always, I will eat breakfast more often.

Authors' Notes

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Footnotes

¹ We examined whether participants with higher BMI achieved less their goal because they set up more difficult, less realistic goals for themselves compared to participants with lower BMI. Two groups on the basis of a median split of subjects' BMI were formed: high BMI ($M = 25.20$; $SD = 4.44$) and low BMI ($M = 20.34$; $SD = 1.60$). Then, body weight goal was submitted to an univariate between subjects ANOVA (BMI: high or low). Results revealed that participants with higher BMI at time 1 set up more difficult goal for themselves ($M = -7.75$) than participants with lower BMI ($M = -4.74$), $F(1, 46) = 6.72$, $p = .01$

² Because participants set up their own personal goal, this raises the question of whether participants with higher autonomous regulation set up more realistic goals than participants with lower autonomous regulation. To investigate this issue, two groups on the basis of a median split of subjects' score on autonomous regulation were formed: high autonomous participants ($M = 5.64$; $SD = .50$) and low autonomous participants ($M = 4.03$; $SD = .82$). Then, body weight goal was submitted to an univariate between subjects ANOVA (Autonomous regulation: high or low). Results revealed that similar body weight goals were chosen by women high in autonomous regulation ($M = -6.68$) and low in autonomous regulation ($M = -6.27$), $F(1, 43) = .11$, $p = .75$. This result suggests that the impact of autonomous regulation on goal attainment reflects better skills at goal's attainment (i.e., reducing the discrepancy between the amount of weight one desires to lose and the actual amount of weight loss) rather than better skills at setting up an optimal and realistic goal.

Out of curiosity, we also examined whether the body weight goals of women with high and low controlled regulation differed. Two groups on the basis of a median split of subjects' score on controlled regulation were formed: high controlled participants ($M = 2.84$; $SD = .63$)

and low controlled participants ($M = 1.56$; $SD = .29$). The result of an univariate between subjects ANOVA (Controlled regulation: high or low) was non significant, $F(1, 44) = 2.53$, $p = .1$, (high: $M = -7.13$; Low: $M = -5.14$).

Table 1
Means, Standard Deviations, and Correlations among all variables

	Means	SD	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Autonomous regulation	4.84	1.06	.02	.11	.20	.38*	.54**	-.04	-.06	.08	.06	.51**	-.21
2. Controlled regulation	2.21	.79		-.05	-.14	-.12	.05	.34*	.41**	.00	.63**	.20	.44**
3. BMI	22.87	4.14			-.53**	-.02	-.04	-.01	-.14	.10	.14	.30*	-.02
4. Weight goal attainment	-5.95	4.64				-.02	.07	.04	-.10	-.05	-.05	.04	-.17
5. Healthy food choice T1	3.69	.48					.66**	-.02	.00	-.12	-.12	.21	-.20
6. Healthy food choice T2	3.83	.35						.05	-.08	-.07	.12	.28	-.08
7. Weight fluctuations	2.21	.88							.31*	.31*	.57**	.29	.43**
8. Splurge alone	1.66	.70								.23	.45**	-.03	.57**
9. Food thoughts	2.33	.82									.28	.42**	.53**
10. Guilt after overeating	2.87	.99										.40**	.61**
11. Eating consciously	3.23	.60											.22
12. Fear of losing control	2.11	.94											

Note. ** = $p < .01$; * = $p < .05$.

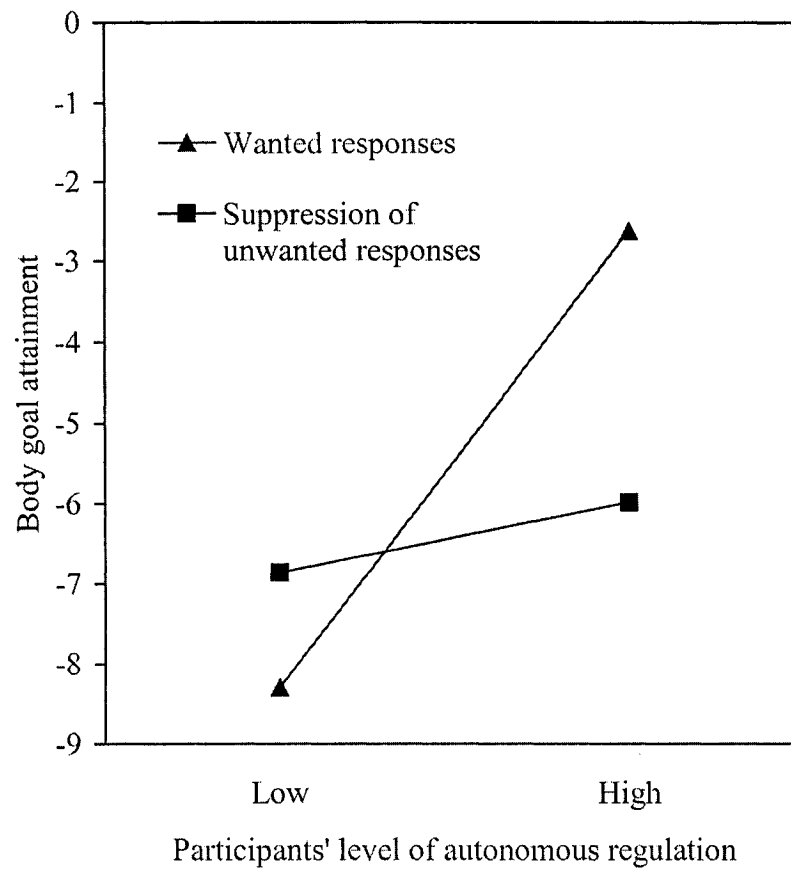
Figure Caption

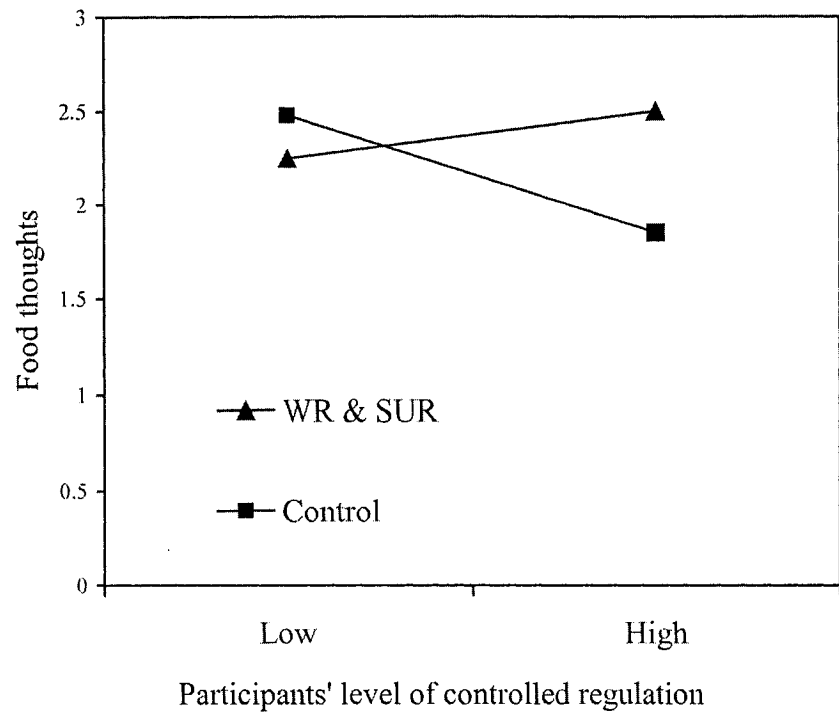
Figure 1. Relation between participants' body goal attainment and their level of autonomous regulation as a function of being exposed to either the implementation intentions on wanted responses condition or the implementation intentions on the suppression of unwanted responses condition.

Note. Low=1 SD below autonomous regulation mean, high=1 SD above the mean.

Figure 2. Relation between participants' food thoughts and their level of controlled regulation as a function of being exposed to either implementation intentions condition or to the control condition.

Note. Low=1 SD below controlled regulation mean, high=1 SD above the mean.





GENERAL DISCUSSION

The primary purpose of this thesis was to examine in more detail the relationships between women's regulation styles for eating behaviours and the development of different dietary patterns. It was hypothesized that the relationship between autonomous regulation for eating behaviours and the development of healthy eating behaviours could be mediated, or explained, by approach food planning and moderated, or altered by an intervention designed to teach women a specific approach food planning strategy. It was also hypothesized that the relationship between controlled regulation for eating behaviours and the development of dysfunctional eating behaviours could be mediated, or accounted for, by avoidance food planning. The impact of an intervention designed to teach women a specific avoidance food planning strategy on the success of the regulation of eating behaviours was also examined as well as its interaction effect with autonomous and controlled regulation. No hypothesis was formulated regarding the avoidance-based intervention since prior studies reported inconsistent findings regarding the beneficial impact of an avoidance orientation (Gollwitzer, Achtziger, Schaal, & Hammelbeck, 2002; Gollwitzer, Fujita, & Oettingen, 2004; Elliot, Sheldon, & Church, 1997; Otis & Pelletier, 2006). This thesis used the theoretical framework provided by the self-determination theory (Deci & Ryan, 1985; 2002). The conceptualization of approach and avoidance food planning was inspired by the abundant work pertaining to approach and avoidance regulation (Carver & Scheier, 1998; Elliot & Sheldon, 1997; Elliot, Sheldon, & Church, 1997).

In the context of this thesis, a total of three studies were conducted. The objective of the first study was to develop and provide partial validation of a scale designed to assess both approach food planning and avoidance food planning. The second study was concerned with

testing the proposed mediators of the regulation styles for eating behaviours-dietary patterns relationships. Finally, the third study investigated the interaction between two types of interventions (implementation intentions on wanted responses and on the suppression of unwanted responses) and regulation styles (autonomous and controlled regulations) on body weight goal attainment.

Summary of Findings

In the first study (Study 1 in the first article), we developed an experimental scale named the Planning of Eating Behaviours Scale (PEBS). We generated 7 items to reflect approach food planning (i.e., planning things that move someone toward the goal of healthy eating) and 7 items to reflect avoidance food planning (i.e., planning strategies of not doing things that would harm the goal of healthy eating). The PEBS, composed of 14 items, was submitted to confirmatory factor analyses in order to verify that responses to the PEBS could best be explained by 2 factors, or subscales. Overall, our results showed that a two-factor model with an added correlation between two measurement error terms provided a good fit for the data. Further, the two-factor model was found to provide a better fit than a one-factor model. The two subscales displayed more than adequate levels of internal consistency. Latent correlation analyses showed that approach food planning was positively associated with avoidance food planning ($\beta = .45$). Preliminary evidence concerning the construct validity of the scale was also obtained. Consistent with past research, we found that avoidance food planning was associated negatively with well-being, while approach food planning was associated positively with well-being. In sum, the analyses conducted so far on the psychometric properties of the PEBS are promising, and suggest that the validation of this scale is worth pursuing.

In the second study of the first article, we tested two mediational models with the procedure outlined by Kenny and his colleagues (Kenny, Kashy, & Bolger, 1998). As expected, in the first model, we identified approach food planning as a partial mediator of the relationship between autonomous regulation and healthy food choices. In other words, women with an autonomous regulation for eating behaviours have a greater propensity to use approach food planning strategies, and as a result, they are more likely to adopt healthy eating behaviours. Also in line with our hypotheses, our second model showed that avoidance food planning was a partial mediator of the relationship between controlled regulation and bulimic symptoms, as well as, a partial mediator of the relationship between controlled regulation and food concerns. This finding means that women who regulate their eating behaviours in a controlled manner have an increased disposition to use avoidance food planning, and consequently, they are more at risk for developing dysfunctional eating behaviours.

Other results worth mentioning concern the interrelations between regulation styles, food planning, and eating behaviours. We found that, while women with an autonomous regulation for eating behaviours favor approach food planning, they use both approach food planning and avoidance food planning. However, women with a controlled regulation only engage in avoidance food planning. Further, it was observed that approach food planning was positively associated with healthy eating behaviours but not with dysfunctional eating behaviours, while avoidance food planning was positively associated with both healthy eating behaviours and dysfunctional eating behaviours. Together these results are in line with Control's Theory (Carver & Scheier, 1998), which posits that avoidance regulation poses problems mainly when used in isolation.

The goal of the third study (of the second article) was to test whether interventions designed to teach women food planning strategies would alter the strength of the relationships between regulation styles for eating behaviours and the outcome of the regulation. Presented in another way, we wanted to assess whether certain planning interventions would be more effective for women with higher or lower levels of autonomous or controlled regulation. Participants in this study were women who were regulating their eating behaviours in order to maintain or lose weight. Thus, success/failure at the regulation of eating behaviours was assessed with a body weight goal index measured one-month after the interventions. Participants were randomly assigned to one of two intervention conditions (i.e., implementation intentions on wanted responses-WR, or implementation intentions on the suppression of unwanted responses-SUR) or a control condition. Implementation intentions on WR represent specific approach plans, which involve linking each good opportunity to act to a specific wanted action. Implementation intentions on SUR represent specific avoidance plans, which involve linking each critical situation with a strategy to avoid performing the unwanted behaviour (Gollwitzer, Fujita, & Oettigen, 2004).

Our results revealed a main effect for autonomous regulation for eating behaviours on body weight goal attainment, such that women with autonomous regulation were more successful at attaining their body weight goal. As expected, our results also revealed an interaction effect between autonomous regulation and the WR condition for body weight goal attainment. More specifically, we found that the positive relationship between autonomous regulation and success at a body weight goal was stronger in the WR condition. Another way to interpret this finding is that the WR condition is beneficial for women with high levels of autonomous regulation but it has little effect for women with low levels of autonomous

regulation. Our results for goal attainment revealed no main effect for the conditions, nor an interaction effect between controlled regulation and any condition. However, both experimental conditions were found to lead participants to eat more consciously. There was also evidence that participants in both implementation conditions had a tendency toward feeling more guilt after overeating, which may mean that participants feel guiltier when they cannot carry out their plans.

Limitations of the Thesis

The findings of the present thesis must be viewed in light of a few limitations. First, participants in all the studies were university women. This population is relevant to the investigation of eating behaviours since university women were found to have the highest levels of eating disorders (Lundholm & Anderson, 1986; Thompson & Kinder, 2003). However, university students often have a different lifestyle than working adults and this may limit the generalization of our findings regarding food planning. More specifically, it may be more difficult for some students who still live with their parents to plan for their meals since their parents prepare the main meals. Likewise, living in residence (e.g., having to share a kitchen) and having a low income may affect meal planning and healthy eating (Epstein et al., 2006). In sum, we acknowledge that the reality of food planning may be different for working women than it is for university women. Second, most of our participants had healthy eating behaviours, low bulimic symptoms, and BMI within the normal range. Therefore, our results may have limited implications for women who meet diagnostic criteria for an eating disorder, and for overweight or obese women who are trying to lose weight. Third, we want to stress that each study of the present thesis has specific limits related to their design and these have been discussed in their respective article.

Theoretical Implications

The present thesis contributes to SDT in two ways. First, few previous studies have provided data concerning the relation between regulation styles and the approach/ avoidance distinction. This lack of data is surprising given that the relations between the autonomy/ control distinction and the approach/ avoidance distinction have been the object of many discussions (Carver & Scheier, 1999; Carver & Scheier, 2000; Deci & Ryan, 2000; Ryan & Deci, 1999). Essentially, Carver and Scheier suggested that approach orientation could completely account for the effect of autonomous regulation and that avoidance orientation could completely account for the effect of controlled regulation. Deci and Ryan replied by giving many examples in which autonomous and controlled goals could be pursued with an approach or an avoidance orientation. For example, an individual can approach a reward while feeling controlled by this reward. However, Deci and Ryan agreed with Carver and Scheier on the proposition that there is a positive correlation between autonomous regulation and approach orientation, as well as between controlled regulation and avoidance orientation. Support for these proposed relations was obtained in one study conducted by Elliot and Sheldon (1998). They found that individuals who reported more avoidance goals also reported less autonomy and more controlledness in their goal pursuit. Our research extends this finding by showing that individuals with an autonomous regulation engage in more approach food planning than avoidance food planning, while individuals with a controlled regulation engage exclusively in avoidance food planning.

Second, by demonstrating that autonomous and controlled regulations are characterized by different goal orientations, this thesis suggests that “why” individuals pursue their goal influences “how” they will go about doing it. According to SDT, individuals who pursue their goals for autonomous reasons experience greater psychological need satisfaction (i.e., need of autonomy, competence and relatedness). Further, the satisfaction of these needs is proposed to

foster the assumed innate tendency of human beings to seek self-improvement and to extend themselves. If individuals with an autonomous regulation are indeed more preoccupied with the learning, changing, and improving aspects of the regulation of eating behaviours, this may explain why they use more approach food planning strategies.

Conversely, controlled regulation is less conducive to psychological need fulfillment and thus this less optimal type of regulation is often associated with feelings of low competencies and fear of failure (Deci & Ryan, 1985). Moreover, because individuals with a controlled regulation do not stand behind their regulation and engage in the regulation only because they feel obligated, they are more vulnerable to adverse situational influences (e.g., stressful week, attending a party where they serve rich and fattening foods). Thus, individuals with a controlled regulation may not feel competent or trust themselves to always respond to critical situations according to their self-regulation goal and therefore they may tend to resort to avoidance food planning. Thus, these results are important because they established that the “why” of the goal pursuit, which represents the crucial starting point of regulatory endeavors, subsequently influences individuals’ means of goal pursuit.

Implications for Weight Control and Dieting

The present thesis has significant implications to help individuals optimize weight-related behaviours and improve diet. First, our results suggest that promoting patients’ autonomous regulation for eating behaviours should be an important goal for interventions. Past research has found that effective support of autonomy involves acknowledging the patient’s perspective and feelings about the recommended changes, explaining why the changes are necessary or beneficial, and giving patients maximum choices about how to proceed (Deci, Eghrari, Patrick, & Leone, 1994). More concrete actions for supporting patients’ autonomy with regard to

changing their diet have also been suggested, such as helping patients identify personal reasons to engage in behaviours, supporting patients' initiatives, reducing salience of social pressures to eat healthy, offering information and choices, and accepting patients' decisions (Bellg, 2003; Williams, Grow, Freedman, Ryan, & Deci, 1996). Interventions based on these recommendations could be developed to help individuals lose weight or change their diet.

Another way to promote autonomous regulation toward eating behaviours, in the context of weight-loss programs or programs designed to promote healthy eating behaviours, could consist of self-reflection exercises (Koestner, Lekes, Powers, & Chicoine, 2002). Often individuals are not fully aware of their reasons for wanting to regulate their eating behaviours. Making individuals reflect on these reasons and leading them to recognize less than optimal reasons for regulating eating behaviours could possibly help the internalization process. For example, making individuals aware that thinking about food with words such as should, must, and ought (ex. I should not eat this piece of cake) often reflects inner pressures they impose on themselves and could thus lead to internal pressures about the regulation of their eating behaviours. Instead, if women think about the regulation of food with words such as want, desire, or "this is my decision" (ex., I have decided to eat vegetables and fruits for lunch), they could experience a sense of self-determination and a positive desire to pursue the activity. Finally, SDT also postulates that the internalization of a regulation is facilitated when individuals have a sense of security and acceptance from important people around them, and when they feel competent. The satisfaction of the need of relatedness and competence, in addition to the need of autonomy, allows individuals the freedom to choose what they want to do (without having the fear of being rejected) and the competence they need to engage in the regulation. Therefore,

based on SDT and past findings, diverse interventions for the development of healthy eating behaviours could be developed and could involve the participation of significant others.

Second, our findings suggest that approach food planning should be favored over avoidance food planning. Other authors have already discussed the positive power of positive goal framing and it was argued that reframing avoidance goals into approach goals could constitute the first step of healthy behaviour interventions (Coats, Janoff-Bulman, & Alpert, 1996). In addition, many interventions for eating disorders have underlined the danger of food restriction (Herman & Polivy, 2004; Herrin, 2003; Hetherington, Stoner, Andersen, & Rolls, 2000). A possible direction for future interventions may be to help people formulate approach food plans vs. avoidance food plans based on a healthy weight management intervention that fosters an understanding of permanent lifestyle changes, an understanding of energy needs, the strategies to develop a balanced diet and the formulation of individualized plans (Stice, Presnell, Groesz, & Shaw, 2005).

However, it could be argued that achieving healthy eating entails both approaching some foods and avoiding some foods, thus it seems natural to plan for both. This rationale is used by many commercial weight loss programs that put an emphasis on avoidance plans (e.g., do not eat white bread; do not eat after 7:00 PM). Moreover, for specific populations (e.g., people with diabetes, or with food allergies), it may be more difficult to refrain completely from the use of avoidance planning. Future research should continue to investigate avoidance planning. Many questions remained answered, such as: Are avoidance food plans always negative? ; Are they necessary (and possibly helpful) for some individuals (such as people with diabetes, or people with severe obesity)? ; What role does avoidance food planning play in developing eating disorders? ; How is avoidance planning different from relapse prevention? .

Directions for Future Research

The Issue of Causality. Future studies should investigate more systematically the proposed direction of relations between regulation styles, planning, and eating behaviours. In the present thesis, we have proposed that women's regulation styles influence how they will plan for their eating behaviours, which subsequently will influence the quality of their eating behaviours. While our data supported the proposed model, it is possible that women with bulimic symptoms feel obligated to control what they eat in order to prevent future episodes of binge eating (i.e., controlled regulation), and may therefore plan their eating behaviours with an emphasis on avoiding overeating and avoiding fattening food. We advocate for longitudinal work using a cross-lagged structural equation model to provide stronger support for the hypothesized sequence. More specifically, participants could complete scales that assess regulation styles, planning of eating behaviours, and eating behaviours at three different points in time. This design could address the temporal precedence of the proposed ordering and explore possible reciprocal relationships among the variables.

We also suggest conducting other studies aimed at disconfirming alternative models and at providing additional support for the proposed model. For example, the hypothesized causal effect of regulation styles on different types of food planning could be examined with a different measure of food planning. More specifically, participants could be asked to generate as many plans as they can think of in a short time period. The nature of these plans could be coded following Dickson and MacLeod's (2004) recommendation, and we could assess whether women high in autonomous regulation and women high in controlled regulation differed in the amount of approach and avoidance plans they generated. While experimental designs provide the most rigorous test of causality, it is questionable for ethical reasons to assign participants to a

condition that aims at promoting controlled regulation of eating behaviours. However, we could examine whether a manipulation designed to increase autonomous regulation for eating behaviours has an impact on the formulation of food plans. Finally, future studies could examine other variables that may contribute to the proposed mediational models. For example, it could be interesting to examine whether regulation styles for eating behaviours influence levels of feelings of competence which, in turn, is responsible for the use of different types of food planning strategies.

Implementation Intentions (WR, SUR). This thesis constitutes a first step toward understanding how implementation intentions on WR differ from implementation intentions on the SUR and how these planning strategies interact with participants' regulation styles. To begin, we compared a WR intervention with a SUR intervention. Our results suggested that formulating implementation intentions focused exclusively on the SUR does not increase the likelihood of attaining a body weight goal. As a second step, it would be interesting in future studies to compare an intervention that asks women to form both types of implementation intentions (on WR and on the SUR), with an intervention that asks women to form only implementation intentions on WR. These studies would be important to determine whether individuals would benefit from using implementation intention on the SUR in addition to implementation intentions on WR, or conversely if the use of SUR could limit the effect of WR.

Also, it would be important to examine whether these results will generalize to different types of goals that people try to achieve. The control of some behaviours (e.g., smoking behaviours, purchase behaviours, alcoholic behaviours) is especially dependent on being able to deal with high-risk situations. For instance, someone who is trying to stop smoking often experiences powerful cravings and may benefit from avoiding situations that trigger these

cravings (e.g., being with other smokers, drinking coffee or alcohol) or by planning how to deal with these situations. Conversely, for the goal to be more physically active, it may be more effective to think of good opportunities to act (i.e., plan when and where to exercise) rather than plan for critical situations (e.g, when I feel tired, I will remind myself of the benefits of exercise). Thus, the question of whether some goals may benefit more from one type of implementation intentions versus the other needs to be examined.

Another direction for future studies on implementation intentions is to examine whether there are ways to increase the effectiveness of implementation intentions on the SUR. These planning strategies are designed to help people deal with risky situations. However, these situations are often affectively charged, and individuals' strategies may reveal less effective in these intense situations. It would be interesting to have participants formulate their implementation intentions on the SUR when they are under conditions that imitate real life risky situations. For example, individuals could be asked to form implementation intentions on the SUR when they are hungry or when they are exposed to attracting foods (ex., a bowl of M&Ms). Future studies could therefore manipulate, for example, the amount of time participants have been fasting before coming to the laboratory.

Conclusions

The purpose of this thesis was to provide a better understanding of how regulation styles for eating behaviours are related to different outcomes by introducing the concept of approach and avoidance food planning. This thesis makes important theoretical contributions to several areas of research. First, the thesis contributes to SDT by showing that different regulation styles for eating behaviours are associated with the use of different food planning strategies. Further, it provides support for the idea that the use of different planning strategies may partly explain why

women with autonomous regulation are able to achieve healthy eating behaviours and why women with controlled regulation are more susceptible to dysfunctional eating behaviours. Second, this thesis makes a contribution to the work on approach and avoidance by using this distinction at the planning level while it has been mostly examined at the goal level. Third, this thesis innovates by manipulating two types of implementation intentions (i.e., on wanted responses and on the suppression of unwanted responses) for a self-regulatory goal (i.e., to maintain or lose weight). While the literature on implementation intentions distinguishes the two types of implementation intentions, few studies have used the SUR manipulation and those that did only examined consequences related to a specific laboratory task. Finally, this thesis underlines the importance of both motivation and self-regulatory strategies in the prediction of success and failure at self-regulation. It seems like the most successful individuals have both the right type of motivation and use optimal self-regulatory strategies.

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(Introduction and General discussion)

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Appendix A

Questionnaire used in Study 1 (Article 1)

Instruction for completing the questionnaire

A study is presently conducted at the University of Ottawa under the Direction of Dr. Luc G. Pelletier, School of Psychology, concerning the relationships between women's habits regarding their eating behaviours, their perceptions of themselves and their reasons for trying to regulate their eating behaviours.

You are under no obligation to participate in this research. Completion of the questionnaire is entirely voluntary and the decision to participate, or not, is yours. You may immediately refuse, or you may elect to discontinue at any time.

In order to ensure anonymity, we ask that you don't put your name on the questionnaire. Your identity will then remain unknown and your answers will be anonymous. The answers will be coded and combined with those of others who have participated. They will be analyzed as a group, rather than on an individual basis. In addition, answers will be kept confidential. No one other than the involved researchers will have access to your responses and these responses will be kept in a locked cabinet in Dr. Pelletier research laboratory at the University of Ottawa.

If you agree to participate in this study, your participation will involve completing this questionnaire package. While the time varies among the people, the questionnaire takes about 25 minutes to complete. When answering the items, we ask that you try to answer them as accurately as possible. It is important to remember that these questionnaires are neither tests nor examinations. There are no right or wrong answers; we are simply interested in your honest opinion. Also, we encourage you not to leave any items unanswered, but instead pick the response that best describes your thoughts and feelings for the item. Of course, you are not obligated to answer any question you do not feel comfortable in responding to, and you are free to withdraw from the study at any time without penalty. Some of the questions concern your feelings, views about your body, and other aspects of a personal nature. It is possible that some individuals may experience mild discomfort when filling them out. Should you have any concerns or questions following the completion of the questionnaire, please do not hesitate to phone us at (613) 562-5800, ext.4179, and we will assist you in identifying the appropriate course of action to address your concerns.

If you wish to receive a copy of the report on this study, you can contact us by phone or by mail at the phone number or the address indicated below (you can detach this page from the questionnaire and keep it if you decide to contact us later).

We would like to extend our appreciation for your co-operation in this research project,
Sincerely,

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GENERAL QUESTIONS ABOUT THE REGULATION OF EATING BEHAVIOURS

(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Self-regulation refers to an individual's ability to exert control over oneself. For example, many people try to regulate their eating behaviours by controlling the amount of food they consume or by choosing healthy food. For each of the following questions, please use the scale provided below each of them and circle the appropriate number.

1. To what extent do **you find important** to regulate your eating behaviours?

Not at all important				Moderately important			Very important
1	2	3	4	5	6	7	

2. To what extent **are you trying to regulate** your eating behaviours?

Not trying at all				Moderately Trying		Trying a lot
1	2	3	4	5	6	7

3. To what extent are you concerned by the **quantity** of food you're eating?

Not concerned at all				Moderately Concerned		Very concerned
1	2	3	4	5	6	7

4. To what extent are you concerned by the **quality** of food you're eating?

Not concerned at all				Moderately Concerned		Very concerned
1	2	3	4	5	6	7

5. To what extent do **you intend to** regulate your eating behaviours in the future?

Do not intend at all				Moderately intend		Very much intend
1	2	3	4	5	6	7

6. To what extent do you **consider yourself successful** in the way you regulate your eating behaviours?

Not at all successful				Moderately Successful		Very successful
1	2	3	4	5	6	7

7. To what extent do you **work towards having better eating habits**?

Not working at all				Moderately working		Working a lot
1	2	3	4	5	6	7

THE REGULATION OF EATING BEHAVIOURS SCALE
(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Listed below are several statements concerning **possible reasons why people might try to regulate their eating behaviours**. Using the scale from 1-7 below, please indicate the degree to which the proposed reasons **correspond to your reasons** for *regulating your eating behaviours*. Circle the appropriate number.

	Does not correspond at all		Corresponds moderately		Corresponds exactly		
1. I don't know why I bother.	1	2	3	4	5	6	7
2. Because I take pleasure in fixing healthy meals.	1	2	3	4	5	6	7
3. Because it is expected of me.	1	2	3	4	5	6	7
4. Because I like to find new ways to create meals that are healthy.	1	2	3	4	5	6	7
5. Because eating healthy is a way to ensure long- term health benefits.	1	2	3	4	5	6	7
6. I don't know. I can't see how my efforts to eat healthy are helping my health situation.	1	2	3	4	5	6	7
7. Because I feel I must absolutely be thin.	1	2	3	4	5	6	7
8. Because I don't want to be ashamed of how I look.	1	2	3	4	5	6	7
9. Because other people insist that I do.	1	2	3	4	5	6	7
10. Because eating healthy is an integral part of my lifestyle.	1	2	3	4	5	6	7
11. For the satisfaction of eating healthy.	1	2	3	4	5	6	7
12. Because I would feel ashamed of myself if I was not eating healthy.	1	2	3	4	5	6	7
13. Because other people close to me (e.g. partner or parents) will be upset if I don't.	1	2	3	4	5	6	7
14. Honestly, I don't know. I can't see what I'm getting out of it.	1	2	3	4	5	6	7
15. Because people around me nag me to do it.	1	2	3	4	5	6	7
16. Because I think it's a good idea to try and regulate my eating behaviours.	1	2	3	4	5	6	7
17. Because eating healthy is part of the way I've chosen to live my life.	1	2	3	4	5	6	7

	Does not correspond at all		Corresponds moderately			Corresponds exactly	
18. Because I would be humiliated if people thought I wasn't in control of my eating behaviours.	1	2	3	4	5	6	7
19. I don't really know; I truly have the impression that I'm wasting my time trying to regulate my eating behaviours.	1	2	3	4	5	6	7
20. Because regulating my eating behaviours has become a fundamental part of who I am.	1	2	3	4	5	6	7
21. Because eating healthy is congruent with other aspects of myself.	1	2	3	4	5	6	7
22. Because I believe that eventually it will allow me to feel better.	1	2	3	4	5	6	7
23. Because I believe it's a good thing I can do to feel better about myself in general.	1	2	3	4	5	6	7
24. Because it's fun to create meals that are good for my health.	1	2	3	4	5	6	7

THE PLANNING OF EATING BEHAVIOURS SCALE (Otis & Pelletier, 2006)

Using the scale below, indicate to what extent you plan for the following activities.

Never	Almost never	Rarely	Sometimes	Often	Almost always	Always				
1	2	3	4	5	6	7				
1. Specific times when I refrained from eating				1	2	3	4	5	6	7
2. Strategies to avoid overeating / snacking when I get bored				1	2	3	4	5	6	7
3. The variety of food I will eat				1	2	3	4	5	6	7
4. Ways to avoid temptations				1	2	3	4	5	6	7
5. Which healthy restaurants I'll go				1	2	3	4	5	6	7
6. Easy and healthy meals to prepare when I anticipate a busy /stressful week				1	2	3	4	5	6	7

Never	Almost never	Rarely	Sometimes	Often	Almost always	Always
1	2	3	4	5	6	7

7. Skipping a meal for a splurge later in the day.	1	2	3	4	5	6	7
8. The quality of food I will eat	1	2	3	4	5	6	7
9. Strategies to avoid succumbing to fattening food	1	2	3	4	5	6	7
10. Not looking at the dessert selection at restaurants	1	2	3	4	5	6	7
11. New and healthy recipes I want to try	1	2	3	4	5	6	7
12. A set of responses to be used when I encountered situations where I tend to overeat (parties, holidays)	1	2	3	4	5	6	7
13. New vegetables and fruits to introduce into meals	1	2	3	4	5	6	7
14. On paper, a list of items to buy at the supermarket.	1	2	3	4	5	6	7

THE HEALTHY EATING HABITS SCALE (Pelletier et al., 2004).

Using the scale from 1 to 5, indicate to what extent you do the different things described in the items listed below.

	Not at all	Sometimes	Most of the time	Often	All of the time
1. I eat vegetables, fruits and grain products (e.g. pastas, cereals, and grain mixtures)	1	2	3	4	5
2. I eat foods that are low in fat, saturated fat, and cholesterol.	1	2	3	4	5
3. I use white sugar.	1	2	3	4	5
4. I use salt.	1	2	3	4	5
5. I consume alcoholic beverages.	1	2	3	4	5
6. I maintain a healthy weight.	1	2	3	4	5
7. I eat a variety of foods from each of the four groups recommended by the Canadian Food Guide (cereals, fruits and vegetables, milk products, and meats and substitutes).	1	2	3	4	5
8. I eat foods such as chips, chocolate and candies.	1	2	3	4	5

- | | | | | | |
|------------------------|---|---|---|---|---|
| 9. I use caffeine. | 1 | 2 | 3 | 4 | 5 |
| 10. I drink water. | 1 | 2 | 3 | 4 | 5 |
| 11. I eat fried foods. | 1 | 2 | 3 | 4 | 5 |

PREPARATION OF MEALS

Using the scale from 1 to 7, indicate to what extent you do the different things described in the items listed below

Never	Almost never	Rarely	Sometimes	Often	Almost always	Always
1	2	3	4	5	6	7

- | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|
| 1. I eat at fast-food restaurant | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I'm in charge of preparing meals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I order pizza or other fried food | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

BULIT-R SCALE (Thelen, Farmer, Wonderlich, & Smith, 1991)

Read the question carefully and circle the number that applies best to you.

- | | |
|---|--|
| <p>1. I am satisfied with my eating patterns.</p> <ul style="list-style-type: none"> a. Agree b. Neutral c. Disagree a little d. Disagree e. Disagree strongly | <p>2. Would you presently call yourself a "binge eater"?</p> <ul style="list-style-type: none"> a. Yes, absolutely b. Yes c. Yes, probably d. Yes, possibly e. No, probably not |
| <p>3. Do you feel you have control over the amount of food you consume?</p> <ul style="list-style-type: none"> a. Most or all of the time b. A lot of the time c. Occasionally d. Rarely e. Never | <p>4. I am satisfied with the shape and size of my body.</p> <ul style="list-style-type: none"> a. Frequently or always b. Sometimes c. Occasionally d. Rarely e. Seldom or never |
| <p>5. When I feel that my eating behaviour is out of control, I try to take rather extreme measures to get back on course (e.g. strict dieting, fasting, laxatives, diuretics, self-induced vomiting, vigorous exercise)</p> <ul style="list-style-type: none"> a. Always b. Almost always c. Frequently d. Sometimes e. Seldom or never | <p>6. I use laxatives or suppositories to help control my weight.</p> <ul style="list-style-type: none"> a. Once a day or more b. 3-6 times a week c. Once or twice a week d. 2-3 time a month e. Once a month or less (or never) |

7. I am obsessed about the size and shape of my body.
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
9. How long have you been binge eating (eating uncontrollably to the point of stuffing yourself)?
 - a. Not applicable; I don't binge eat
 - b. Less than 3 months
 - c. 3 months to a year
 - d. 1-3 years
 - e. 3 or more years
11. I exercise in order to burn calories.
 - a. More than 2 hours a day
 - b. About 2 hours a day
 - c. More than 1 but less than 2 hours a day
 - d. One hour or less a day
 - e. I exercise but not to burn calories or don't exercise
13. I am afraid to eat anything for fear that I won't be able to stop.
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
15. How often do you intentionally vomit after eating?
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
17. My eating patterns are different from the eating patterns of most people.
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
8. There are times I rapidly eat a very large amount of food.
 - a. More than twice a week
 - b. Twice a week
 - c. Once a week
 - d. 2-3 times a month
 - e. Once a month or less (or never)
 - f.
10. Most people I know would be amazed if they knew how much food I can consume at one sitting.
 - a. Without a doubt
 - b. Very probable
 - c. Probably
 - d. Possibly
 - e. No
12. Compared with women your age, how preoccupied are you about your weight and body shape?
 - a. A great deal more than average
 - b. Much more than average
 - c. More than average
 - d. A little more than average
 - e. Average or less than average
14. I feel tormented by the idea that I am fat or might gain weight.
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
16. I eat a lot of food when I'm not even hungry
 - a. Very frequently
 - b. Frequently
 - c. Occasionally
 - d. Sometimes
 - e. Seldom or never
18. After I binge eat I turn to one of several strict methods to try to keep from gaining weight (vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives, or diuretics)
 - a. Never or I don't binge eat
 - b. Rarely
 - c. Occasionally
 - d. A lot of the time
 - e. Most or all of the time

19. I have tried to lose weight by fasting or going on strict diets.
- Not in the past year
 - Once in the past year
 - 2-3 times in the past year
 - 4-5 times in the past year
 - More than 5 times in the past year
20. I exercise vigorously and for long periods of time in order to burn calories.
- Average or less than average
 - A little more than average
 - More than average
 - Much more than average
 - A great deal more than average
21. When engaged in an eating binge, I tend to eat foods that are high in carbohydrates (sweets and starches).
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or I don't binge
22. Compared to most people, my ability to control my eating behaviour seems to be:
- Greater than other's ability
 - About the same
 - Less
 - Much less
 - I have absolutely no control
23. I would presently label myself a "compulsive eater" (one who eats in episodes of uncontrolled eating).
- Absolutely
 - Yes
 - Yes, probably
 - Yes, possibly
 - No, probably not
24. I hate the way my body looks after I have eaten too much.
- Seldom or never
 - Sometimes
 - Frequently
 - Almost always
 - Always
25. When I am trying to keep from gaining weight, I feel that I have to resort to vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives, or diuretics.
- Never
 - Rarely
 - Occasionally
 - A lot of the time
 - Most or all of the time
26. Do you believe that it is easier for you to vomit than it is for most people?
- Yes, it's no problem at all for me
 - Yes, it's easier
 - Yes, it's a little easier
 - About the same
 - No, it's less easy
27. I use diuretics (water pills) to help control my weight.
- Never
 - Seldom
 - Sometimes
 - Frequently
 - Very frequently
28. I feel that food controls my life.
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or never

29. I try to control my weight by eating little or no food for a day or longer.
- Never
 - Seldom
 - Sometimes
 - Frequently
 - Very frequently
30. When consuming a large quantity of food, at what rate of speed do you usually eat?
- More rapidly than most people have ever eaten in their lives
 - A lot more rapidly than most people
 - A little more rapidly than most people
 - About the same rate as most people
 - More slowly than most people (or not applicable)
31. I use laxatives or suppositories to help control my weight.
- Never
 - Seldom
 - Sometimes
 - Frequently
 - Very frequently
32. Right after I binge I feel:
- So fat and bloated I can't stand it
 - Extremely fat
 - Fat
 - A little fat
 - OK about how my body looks or I never binge eat
33. Compared to other people of my sex, my ability to always feel in control of how much I eat is:
- About the same or greater
 - A little less
 - Less
 - Much less
 - A great deal less
34. In the last 3 months, on average how often did you binge eat (eat uncontrollably to the point of stuffing yourself)?
- Once a month or less (or never)
 - 2-3 times a month
 - Once a week
 - Twice a week
 - More than twice a week
35. Most people I know would be surprised at how fat I look after I have eaten a lot of food.
- Yes, definitely
 - Yes
 - Yes, probably
 - Yes, possibly
 - No, probably not or I never eat a lot of food
-

VITALITY SCALE (Ryan and Frederick, 1997)

Please respond to each of the following statements by indicating the degree to which the statement is true for you in general in your life. Use the following scale:

Not at all true			Somewhat true			Very true	
1	2	3	4	5	6	7	

IN GENERAL IN MY LIFE....

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. I feel alive and vital. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I don't feel very energetic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am preoccupied with other thoughts. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I have energy and spirit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I feel alert and awake. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I am easily distracted. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I am drained. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I feel so alive I just want to burst. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I look forward to each new day. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I feel depleted of energy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

THE PSYCHOLOGICAL WELL-BEING SCALE (PWB, Ryff & Keyes, 1995)

The following set of questions deals with how you feel about yourself and your life. Please remember that there are no right or wrong answers. Circle the number that best describes your present agreement or disagreement with each statement.

Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
1	2	3	4	5	6

- | | | | | | | |
|---|---|---|---|---|---|---|
| 1. I tend to be influenced by people with strong opinions. | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. In general, I feel I am in charge of the situation in which I live. | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. I think it is important to have new experiences.
that challenge how you think about yourself and the world. | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Maintaining close relationships has been difficult and
frustrating for me. | 1 | 2 | 3 | 4 | 5 | 6 |

Strongly Disagree 1	Disagree Somewhat 2	Disagree Slightly 3	Agree Slightly 4	Agree Somewhat 5	Strongly Agree 6
5. I live life one day at a time and don't really think about the future.					
				1	2 3 4 5 6
6. When I look at the story of my life, I am pleased with how things have turned out.					
				1	2 3 4 5 6
7. I have confidence in my opinions, even if they are contrary to the general consensus.					
				1	2 3 4 5 6
8. The demands of everyday life often get me down.					
				1	2 3 4 5 6
9. For me, life has been a continuous process of learning, changing, and growth.					
				1	2 3 4 5 6
10. People would describe me as a giving person, willing to share my time with others.					
				1	2 3 4 5 6
11. Some people wander aimlessly through life, but I am Not one of them.					
				1	2 3 4 5 6
12. I like most aspects of my personality.					
				1	2 3 4 5 6
13. I judge myself by what I think is important, not by the values of what others think is important.					
				1	2 3 4 5 6
14. I am quite good at managing the many responsibilities of my daily life.					
				1	2 3 4 5 6
15. I gave up trying to make big improvements or changes in my life a long time ago.					
				1	2 3 4 5 6

GENERAL INFORMATION

1. Age: _____
2. Gender: _____ Female _____ Male
3. Height: _____ (ft. and in.) or _____ (cm.)
4. Weight: _____ (lbs.) or _____ (kg)
5. Income: What was your individual annual income this past year? _____
 If different, what was your household income? _____
6. Highest level of education completed: _____
7. Program of study: _____
8. Employment (choose only one): _____ student _____ family benefits
 _____ disability _____ unemployed
 _____ employed _____ homemaker
 _____ retired
8. Relationship status: _____ partnered
 _____ single
 _____ separated or divorced
 _____ widow
9. Living arrangement:
 _____ family _____ friends _____ alone
 _____ residence _____ partner
10. If you have been dieting, what was your main reason? Please list only one.

11. Do you smoke? _____ yes
 _____ no
 If so, how many cigarettes per day? _____

Appendix B
Questionnaire used in Study 2 (Article 1)

Instruction for completing the questionnaire

A study is presently conducted at the University of Ottawa under the Direction of Dr. Luc G. Pelletier, School of Psychology, concerning the relationships between women's habits regarding their eating behaviours, their perceptions of themselves and their reasons for trying to regulate their eating behaviours. You are under no obligation to participate in this research. Completion of the questionnaire is entirely voluntary and the decision to participate, or not, is yours. You may immediately refuse, or you may elect to discontinue at any time.

In order to ensure anonymity, we ask that you don't put your name on the questionnaire. Your identity will then remain unknown and your answers will be anonymous. The answers will be coded and combined with those of others who have participated. They will be analyzed as a group, rather than on an individual basis. In addition, answers will be kept confidential. No one other than the involved researchers will have access to your responses and these responses will be kept in a locked cabinet in Dr. Pelletier research laboratory at the University of Ottawa for 5 years after the time of publication in professional journals.

If you agree to participate in this study, your participation will involve completing this questionnaire package. While the time varies among the people, the questionnaire takes about 25 minutes to complete. When answering the items, we ask that you try to answer them as accurately as possible. It is important to remember that these questionnaires are neither tests nor examinations. There are no right or wrong answers; we are simply interested in your honest opinion. Also, we encourage you not to leave any items unanswered, but instead pick the response that best describes your thoughts and feelings for the item. Of course, you are not obligated to answer any question you do not feel comfortable in responding to, and you are free to withdraw from the study at any time without penalty. Some of the questions concern your feelings, views about your body, and other aspects of a personal nature. It is possible that some individuals may experience mild discomfort when filling them out. Should you have any concerns or questions following the completion of the questionnaire, please do not hesitate to phone us at (613) 562-5800, ext.4179, and we will assist you in identifying the appropriate course of action to address your concerns. Any information about my rights as a research participant may be addressed to Protocol Officer for Ethics in Research, 550 Cumberland Street, Room 159, (613) 562-5841 or ethics@uottawa.ca.

If you wish to receive a copy of the report on this study, you can contact us by phone or by mail at the phone number or the address indicated below (you can detach this page from the questionnaire and keep it if you decide to contact us later).

We would like to extend our appreciation for your co-operation in this research project,

Sincerely,

Luc G. Pelletier, Ph.D.
School of Psychology, University of Ottawa
145 Jean-Jacques Lussier St.
P.O. Box 450, Station A
Ottawa, Ontario K1N 6N5
(613) 562-5800, ext. 4179

Nancy Otis, Graduate student

GENERAL QUESTIONS ABOUT THE REGULATION OF EATING BEHAVIOURS

(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

For each of the following questions, please use the scale provided below each of them and circle the appropriate number.

1. To what extent do you **consider yourself successful** in the way you regulate your eating behaviours?

Not at all successful				Moderately Successful			Very successful
1	2	3		4	5	6	7

2. To what extent are you **satisfied** with the regulation of your eating behaviours?

Not at all satisfied				Moderately Satisfied			Very satisfied
1	2	3		4	5	6	7

3. To what extent is your goal to regulate your eating behaviours **important** to you?

Not at all important				Moderately important			Very important
1	2	3		4	5	6	7

4. To what extent is your goal to regulate your eating behaviours **difficult** for you?

Not at all difficult				Moderately difficult			Very difficult
1	2	3		4	5	6	7

5. To what extent do you feel you have the **skills and resources necessary** to effectively regulate your eating behaviours?

Not at all				Moderately			Very
1	2	3		4	5	6	7

6. To what extent are you **committed** to the regulation of your eating behaviours?

Not at all committed				Moderately Committed			Very committed
1	2	3		4	5	6	7

THE REGULATION OF EATING BEHAVIOURS SCALE
(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Listed below are several statements concerning **possible reasons why people might try to regulate their eating behaviours**. Using the scale from 1-7 below, please indicate the degree to which the proposed reasons **correspond to your reasons** for *regulating your eating behaviours*. Circle the appropriate number.

	Does not correspond at all		Corresponds moderately		Corresponds exactly		
1. I don't know why I bother.	1	2	3	4	5	6	7
2. Because I take pleasure in fixing healthy meals.	1	2	3	4	5	6	7
3. Because it is expected of me.	1	2	3	4	5	6	7
4. Because I like to find new ways to create meals that are healthy.	1	2	3	4	5	6	7
5. Because eating healthy is a way to ensure long- term health benefits.	1	2	3	4	5	6	7
6. I don't know. I can't see how my efforts to eat healthy are helping my health situation.	1	2	3	4	5	6	7
7. Because I feel I must absolutely be thin.	1	2	3	4	5	6	7
8. Because I don't want to be ashamed of how I look.	1	2	3	4	5	6	7
9. Because other people insist that I do.	1	2	3	4	5	6	7
10. Because eating healthy is an integral part of my lifestyle.	1	2	3	4	5	6	7
11. For the satisfaction of eating healthy.	1	2	3	4	5	6	7
12. Because I would feel ashamed of myself if I was not eating healthy.	1	2	3	4	5	6	7
13. Because other people close to me (e.g. partner or parents) will be upset if I don't.	1	2	3	4	5	6	7
14. Honestly, I don't know. I can't see what I'm getting out of it.	1	2	3	4	5	6	7
15. Because people around me nag me to do it.	1	2	3	4	5	6	7
16. Because I think it's a good idea to try and regulate my eating behaviours.	1	2	3	4	5	6	7
17. Because eating healthy is part of the way I've chosen to live my life.	1	2	3	4	5	6	7

18. Because I would be humiliated if people thought I wasn't in control of my eating behaviours.	1	2	3	4	5	6	7
19. I don't really know; I truly have the impression that I'm wasting my time trying to regulate my eating behaviours.	1	2	3	4	5	6	7
20. Because regulating my eating behaviours has become a fundamental part of who I am.	1	2	3	4	5	6	7
21. Because eating healthy is congruent with other aspects of myself.	1	2	3	4	5	6	7
22. Because I believe that eventually it will allow me to feel better.	1	2	3	4	5	6	7
23. Because I believe it's a good thing I can do to feel better about myself in general.	1	2	3	4	5	6	7
24. Because it's fun to create meals that are good for my health.	1	2	3	4	5	6	7

THE PLANNING OF EATING BEHAVIOURS SCALE (PEBS, Otis & Pelletier, 2006)

Using the scale below, indicate to what extent you plan for the following activities.

Never	Almost never	Rarely	Sometimes	Often	Almost always	Always
1	2	3	4	5	6	7

I USUALLY THINK IN ADVANCE ABOUT:

1. Specific times when I refrained from eating	1	2	3	4	5	6	7
2. Strategies to avoid overeating / snacking when I get bored	1	2	3	4	5	6	7
3. The variety of food I will eat	1	2	3	4	5	6	7
4. Ways to avoid temptations	1	2	3	4	5	6	7
5. Which healthy restaurants I'll go	1	2	3	4	5	6	7
6. Easy and healthy meals to prepare when I anticipate a busy /stressful week	1	2	3	4	5	6	7

Never	Almost never	Rarely	Sometimes	Often	Almost always	Always
1	2	3	4	5	6	7

- | | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7. Skipping a meal for a splurge later in the day. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. The quality of food I will eat | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Strategies to avoid succumbing to fattening food | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Not looking at the dessert selection at restaurants | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. New and healthy recipes I want to try | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. A set of responses to be used when I encountered situations where I tend to overeat (parties, holidays) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. New vegetables and fruits to introduce into meals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. On paper, a list of items to buy at the supermarket. | 1 | 2 | 3 | 4 | 5 | 6 | |

HEALTHY EATING HABITS SCALE

(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Using the scale from 1 to 5, indicate to what extent you do the different things described in the items listed below.

- | | Not at all | Sometimes | Most of the
time | Often | All of
the time |
|--|------------|-----------|---------------------|-------|--------------------|
| 1. I eat vegetables, fruits and grain products
(e.g. pastas, cereals, and grain mixtures) | 1 | 2 | 3 | 4 | 5 |
| 2. I eat foods that are low in fat, saturated fat,
and cholesterol. | 1 | 2 | 3 | 4 | 5 |
| 3. I use white sugar. | 1 | 2 | 3 | 4 | 5 |
| 4. I use salt. | 1 | 2 | 3 | 4 | 5 |
| 5. I consume alcoholic beverages. | 1 | 2 | 3 | 4 | 5 |
| 6. I maintain a healthy weight. | 1 | 2 | 3 | 4 | 5 |
| 7. I eat a variety of foods from each of the four
groups recommended by the Canadian Food
Guide (cereals, fruits and vegetables, milk
products, and meats and substitutes). | 1 | 2 | 3 | 4 | 5 |
| 8. I eat foods such as chips, chocolate and
candies. | 1 | 2 | 3 | 4 | 5 |

9. I use caffeine.	1	2	3	4	5
10. I drink water.	1	2	3	4	5
11. I eat fried foods.	1	2	3	4	5

THE BULIT-R SCALE (Thelen, Farmer, Wonderlich, & Smith, 1991)

Read the question carefully and circle the number that applies best to you.

1. I am satisfied with my eating patterns.
 - a. Agree
 - b. Neutral
 - c. Disagree a little
 - d. Disagree
 - e. Disagree strongly
2. Would you presently call yourself a "binge eater"?
 - a. Yes, absolutely
 - b. Yes
 - c. Yes, probably
 - d. Yes, possibly
 - f. No, probably not
3. Do you feel you have control over the amount of food you consume?
 - a. Most or all of the time
 - b. A lot of the time
 - c. Occasionally
 - d. Rarely
 - e. Never
4. I am satisfied with the shape and size of my body.
 - a. Frequently or always
 - b. Sometimes
 - c. Occasionally
 - d. Rarely
 - e. Seldom or never
5. When I feel that my eating behaviour is out of control, I try to take rather extreme measures to get back on course (e.g. strict dieting, fasting, laxatives, diuretics, self-induced vomiting, vigorous exercise)
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
6. I use laxatives or suppositories to help control my weight.
 - a. Once a day or more
 - b. 3-6 times a week
 - c. Once or twice a week
 - d. 2-3 time a month
 - e. Once a month or less (or never)
7. I am obsessed about the size and shape of my body.
 - a. Always
 - b. Almost always
 - c. Frequently
 - d. Sometimes
 - e. Seldom or never
8. There are times I rapidly eat a very large amount of food.
 - a. More than twice a week
 - b. Twice a week
 - c. Once a week
 - d. 2-3 times a month
 - e. Once a month or less (or never)

9. How long have you been binge eating (eating uncontrollably to the point of stuffing yourself)?
- Not applicable; I don't binge eat
 - Less than 3 months
 - 3 months to a year
 - 1-3 years
 - 3 or more years
10. Most people I know would be amazed if they knew how much food I can consume at one sitting.
- Without a doubt
 - Very probable
 - Probably
 - Possibly
 - No
11. I exercise in order to burn calories.
- More than 2 hours a day
 - About 2 hours a day
 - More than 1 but less than 2 hours a day
 - One hour or less a day
 - I exercise but not to burn calories or don't exercise
12. Compared with women your age, how preoccupied are you about your weight and body shape?
- A great deal more than average
 - Much more than average
 - More than average
 - A little more than average
 - Average or less than average
13. I am afraid to eat anything for fear that I won't be able to stop.
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or never
14. I feel tormented by the idea that I am fat or might gain weight.
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or never
15. How often do you intentionally vomit after eating?
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or never
16. I eat a lot of food when I'm not even hungry
- Very frequently
 - Frequently
 - Occasionally
 - Sometimes
 - Seldom or never
17. My eating patterns are different from the eating patterns of most people.
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or never
18. After I binge eat I turn to one of several strict methods to try to keep from gaining weight (vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives, or diuretics)
- Never or I don't binge eat
 - Rarely
 - Occasionally
 - A lot of the time
 - Most or all of the time
19. I have tried to loose weight by fasting or going on strict diets.
- Not in the past year
 - Once in the past year
 - 2-3 times in the past year
 - 4-5 times in the past year
 - More than 5 times in the past year
20. I exercise vigorously and for long periods of time in order to burn calories.
- Average or less than average
 - A little more than average
 - More than average
 - Much more than average
 - A great deal more than average

21. When engaged in an eating binge, I tend to eat foods that are high in carbohydrates (sweets and starches).
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or I don't binge
22. Compared to most people, my ability to control my eating behaviour seems to be:
- Greater than other's ability
 - About the same
 - Less
 - Much less
 - I have absolutely no control
23. I would presently label myself a "compulsive eater" (one who eats in episodes of uncontrolled eating).
- Absolutely
 - Yes
 - Yes, probably
 - Yes, possibly
 - No, probably not
24. I hate the way my body looks after I have eaten too much.
- Seldom or never
 - Sometimes
 - Frequently
 - Almost always
 - Always
25. When I am trying to keep from gaining weight, I feel that I have to resort to vigorous exercise, strict dieting, fasting, self-induced vomiting, laxatives, or diuretics.
- Never
 - Rarely
 - Occasionally
 - A lot of the time
 - Most or all of the time
26. Do you believe that it is easier for you to vomit than it is for most people?
- Yes, it's no problem at all for me
 - Yes, it's easier
 - Yes, it's a little easier
 - About the same
 - No, it's less easy
27. I use diuretics (water pills) to help control my weight.
- Never
 - Seldom
 - Sometimes
 - Frequently
 - Very frequently
28. I feel that food controls my life.
- Always
 - Almost always
 - Frequently
 - Sometimes
 - Seldom or never
29. I try to control my weight by eating little or no food for a day or longer.
- Never
 - Seldom
 - Sometimes
 - Frequently
 - Very frequently
30. When consuming a large quantity of food, at what rate of speed do you usually eat?
- More rapidly than most people have ever eaten in their lives
 - A lot more rapidly than most people
 - A little more rapidly than most people
 - About the same rate as most people
 - More slowly than most people (or not applicable)

31. I use laxatives or suppositories to help control my weight.
- Never
 - Seldom
 - Sometimes
 - Frequently
 - Very frequently
32. Right after I binge I feel:
- So fat and bloated I can't stand it
 - Extremely fat
 - Fat
 - A little fat
 - OK about how my body looks or I never binge eat
33. Compared to other people of my sex, my ability to always feel in control of how much I eat is:
- About the same or greater
 - A little less
 - Less
 - Much less
 - A great deal less
34. In the last 3 months, on average how often did you binge eat (eat uncontrollably to the point of stuffing yourself)?
- Once a month or less (or never)
 - 2-3 times a month
 - Once a week
 - Twice a week
 - More than twice a week
35. Most people I know would be surprised at how fat I look after I have eaten a lot of food.
- Yes, definitely
 - Yes
 - Yes, probably
 - Yes, possibly
 - No, probably not or I never eat a lot of food

THE EATING DISORDER EXAMINATION-SELF REPORT QUESTIONNAIRE
(Fairburn & Beglin, 1994)

1. Would a weight fluctuation of 5 lbs. affect the way you live your life? (circle one)

Not at all	Slightly	Moderately	Very much
1	2	3	4

2. Do you eat sensibly in front of others and splurge alone? (circle one)

Never	Rarely	Often	Always
1	2	3	4

3. Do you give too much time and thoughts to food (circle one)

Never	Rarely	Often	Always
1	2	3	4

4. Do you have feelings of guilt after overeating (circle one)

Never	Rarely	Often	Always
1	2	3	4

5. How conscious are you of what you're eating (circle one)

Never	Rarely	Often	Always
1	2	3	4

6. Do you fear loss of control over eating (circle one)

Never	Rarely	Often	Always
1	2	3	4

THE VITALITY SCALE (Ryan and Frederick, 1997)

Please respond to each of the following statements by indicating the degree to which the statement is true for you in general in your life. Use the following scale:

Not at all true		Somewhat true			Very true	
1	2	3	4	5	6	7

IN GENERAL IN MY LIFE....

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. I feel alive and vital. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I don't feel very energetic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am preoccupied with other thoughts. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I have energy and spirit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I feel alert and awake. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I am easily distracted. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I am drained. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I feel so alive I just want to burst. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I look forward to each new day. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I feel depleted of energy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix C
Questionnaire 1 for Study 3 (Article 2)

FORMULAIRE DE CONSENTEMENT

Luc Pelletier, Ph.D
École de Psychologie
Université d'Ottawa
Montpetit 401
Téléphone: 562-5800 (4201)
Courriel: social@uottawa.ca

Je soussigné, _____, accepte de participer à cette étude en laboratoire supervisée par Luc Pelletier, Ph.D., professeur à l'École de Psychologie. La présente étude a pour but de mieux comprendre l'expérience des femmes qui contrôlent leur l'alimentation pour perdre de poids.

Ma participation à cette étude consistera essentiellement à participer à deux sessions en laboratoire d'environ 25 min, pendant lesquelles je vais répondre à un questionnaire et je vais être pesé et mesuré. Tel qu'expliqué lors de l'introduction du cours PSYxxxx, ma participation à cette étude me procurera un point à ma note finale de ce cours.

Je comprends que les données recueillies seront utilisées uniquement pour les biens de la présente étude et selon le respect des règles de confidentialité, limitant l'accès des données au superviseur et aux expérimentateurs de cette présente étude.

J'ai reçu l'assurance des personnes responsables du projet de recherche, que toute la procédure de l'étude a été conçue en vue de minimiser les risques possibles d'inconfort émotionnel étant donné l'information personnelle partagée lors de l'expérience. Je comprends que je suis libre de me retirer de cette étude en tout temps, avant ou pendant l'expérience, refuser d'y participer ou refuser de répondre à certaines questions.

J'ai reçu l'assurance des personnes responsables de la recherche, que l'information que je partagerai avec eux restera strictement confidentielle. Mon nom ne sera pas associé aux résultats obtenus d'aucune façon.

Pour tout renseignement sur mes droits comme participant à une recherche, je peux m'adresser au Responsable de la déontologie en recherche, 550, rue Cumberland, pièce 159, (613) 562-5841 ou ethics@uottawa.ca . Pour des renseignements additionnels concernant cette étude, je peux communiquer avec le chercheur ou son superviseur au numéro de téléphone (613) 562-5800 poste 4179.

Il y a deux copies du formulaire de consentement, dont une que je peux conserver.

Signature du chercheur: _____ Date: _____

Signature du participant : _____ Date: _____

GENERAL QUESTIONS ABOUT EATING BEHAVIOURS

(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Self-regulation refers to an individual's ability to exert control over oneself. For example, many people try to regulate their eating behaviours by controlling the amount of food they consume or by choosing healthy food. For each of the following questions, please use the scale provided below each of them and circle the appropriate number.

1. To what extent do **you find important** to regulate your eating behaviours?

Not important at all				Moderately important			Very important
1	2	3	4	5	6	7	

2. To what extent **are you trying to regulate** your eating behaviours?

Not trying at all				Moderately trying			Trying a lot
1	2	3	4	5	6	7	

3. To what extent are you concerned by the **quantity** of food you're eating?

Not concerned at all				Moderately concerned			Very concerned
1	2	3	4	5	6	7	

4. To what extent are you concerned by the **quality** of food you're eating?

Not concerned at all				Moderately concerned			Very concerned
1	2	3	4	5	6	7	

5. To what extent do **you intend to regulate** your eating behaviours in the future?

Do not intend at all				Moderately intend			Very much intend
1	2	3	4	5	6	7	

6. To what extent do you **consider yourself successful** in the way you regulate your eating behaviours?

Not at all successful				Moderately successful			Very successful
1	2	3	4	5	6	7	

THE REGULATION OF EATING BEHAVIOURS SCALE
(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Listed below are several statements concerning **possible reasons why people might try to regulate their eating behaviours**. Using the scale from 1-7 below, please indicate the degree to which the proposed reasons **correspond to your reasons** for *regulating your eating behaviours*. Circle the appropriate number.

	Does not correspond at all		Corresponds moderately		Corresponds exactly		
1. I don't know why I bother.	1	2	3	4	5	6	7
2. Because I take pleasure in fixing healthy meals.	1	2	3	4	5	6	7
3. Because it is expected of me.	1	2	3	4	5	6	7
4. Because I like to find new ways to create meals that are healthy.	1	2	3	4	5	6	7
5. Because eating healthy is a way to ensure long- term health benefits.	1	2	3	4	5	6	7
6. I don't know. I can't see how my efforts to eat healthy are helping my health situation.	1	2	3	4	5	6	7
7. Because I feel I must absolutely be thin.	1	2	3	4	5	6	7
8. Because I don't want to be ashamed of how I look.	1	2	3	4	5	6	7
9. Because other people insist that I do.	1	2	3	4	5	6	7
10. Because eating healthy is an integral part of my lifestyle.	1	2	3	4	5	6	7
11. For the satisfaction of eating healthy.	1	2	3	4	5	6	7
12. Because I would feel ashamed of myself if I was not eating healthy.	1	2	3	4	5	6	7
13. Because other people close to me (e.g. partner or parents) will be upset if I don't.	1	2	3	4	5	6	7
14. Honestly, I don't know. I can't see what I'm getting out of it.	1	2	3	4	5	6	7
15. Because people around me nag me to do it.	1	2	3	4	5	6	7
16. Because I think it's a good idea to try and regulate my eating behaviours.	1	2	3	4	5	6	7
17. Because eating healthy is part of the way I've chosen to live my life.	1	2	3	4	5	6	7

18.Because I would be humiliated if people thought I wasn't in control of my eating behaviours.	1	2	3	4	5	6	7
19.I don't really know; I truly have the impression that I'm wasting my time trying to regulate my eating behaviours.	1	2	3	4	5	6	7
20.Because regulating my eating behaviours has become a fundamental part of who I am.	1	2	3	4	5	6	7
21.Because eating healthy is congruent with other aspects of myself.	1	2	3	4	5	6	7
22.Because I believe that eventually it will allow me to feel better.	1	2	3	4	5	6	7
23.Because I believe it's a good thing I can do to feel better about myself in general.	1	2	3	4	5	6	7
24.Because it's fun to create meals that are good for my health.	1	2	3	4	5	6	7

Appendix D
Questionnaire 2 for Study 3 (Article 2)

GENERAL QUESTIONS ABOUT THE REGULATION OF EATING BEHAVIOURS

(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

For each of the following questions, please use the scale provided below each of them and circle the appropriate number.

1. To what extent do you **consider yourself successful** in the way you regulate your eating behaviours?

Not at all successful				Moderately Successful			Very Successful
1	2	3	4	5	6	7	

2. To what extent are you **satisfied** with the regulation of your eating behaviours?

Not at all satisfied			Moderately Satisfied			Very Satisfied
1	2	3	4	5	6	7

3. To what extent is your goal to regulate your eating behaviours **important** to you?

Not at all important			Moderately important			Very important
1	2	3	4	5	6	7

4. To what extent is your goal to regulate your eating behaviours **difficult** for you?

Not at all difficult			Moderately difficult			Very difficult
1	2	3	4	5	6	7

5. To what extent do you feel you have the **skills and resources necessary** to effectively regulate your eating behaviours?

Not at all			Moderately			Very
1	2	3	4	5	6	7

6. To what extent are you **committed** to the regulation of your eating behaviours?

Not at all committed			Moderately Committed			Very Committed
1	2	3	4	5	6	7

Eating Disorder Inventory - Body Dissatisfaction Subscale (EDI-BD; Garner, 1991).

Please answer each question using the scale provided below:

	Never	Rarely	Sometimes	Often	Very often	Always
1. I think my stomach is too big.	1	2	3	4	5	6
2. I think my thighs are too large.	1	2	3	4	5	6
3. I feel satisfied with the shape of my body.	1	2	3	4	5	6
4. I like the shape of my buttocks.	1	2	3	4	5	6
5. I think my hips are just the right size.	1	2	3	4	5	6
6. Have you ever felt ashamed of your body?	1	2	3	4	5	6
7. Have you ever felt happiest about your shape when your stomach has been empty (e.g. in the morning)?	1	2	3	4	5	6
8. Have you been particularly self-conscious about your shape when in company of other people?	1	2	3	4	5	6
9. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?	1	2	3	4	5	6
10. Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming pools)?	1	2	3	4	5	6
11. Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
12. Has feeling full (e.g. after a large meal) made you feel fat?	1	2	3	4	5	6
13. Have you noticed the shape of other people of same sex and felt that your own shape compared unfavorably?	1	2	3	4	5	6
14. Have you been so worried about your shape that you have been feeling you ought to diet?	1	2	3	4	5	6
15. Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6

Eating Disorder Inventory - Body Dissatisfaction Subscale (EDI-BD; Garner, 1991) (cont'd)

1. Does your mood affect the way you feel about your body?	1	2	3	4	5
2. Is it hard for you to accept compliments about the way you look?	1	2	3	4	5
3. Do you avoid situations where others would see your body, such as swimming parties and social occasions that call for scanty dress?	1	2	3	4	5
4. Do you think you look bad on days you haven't exercised?	1	2	3	4	5
5. Do you remark disparagingly about your body to yourself or others?	1	2	3	4	5
6. In thinking about your body, do you focus on the parts you believe need improvement?	1	2	3	4	5
7. Do you feel threatened or depressed by women/men you perceive as more attractive than yourself?	1	2	3	4	5
8. How often do you find yourself asking others (spouse, friends) how you look?	1	2	3	4	5
9. How often do you worry about your weight?	1	2	3	4	5
10. Are you self-conscious about eating in front of other people?	1	2	3	4	5

THE HEALTHY EATING HABITS SCALE
(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Using the scale from 1 to 5, indicate to what extent you do the different things described in the items listed below.

	Not at all	Sometimes	Most of the time	Often	All of the time
1. I eat vegetables, fruits and grain products (e.g. pastas, cereals, and grain mixtures)	1	2	3	4	5
2. I eat foods that are low in fat, saturated fat, and cholesterol.	1	2	3	4	5
3. I use white sugar.	1	2	3	4	5
4. I use salt.	1	2	3	4	5
5. I consume alcoholic beverages.	1	2	3	4	5
6. I maintain a healthy weight.	1	2	3	4	5
7. I eat a variety of foods from each of the four groups recommended by the Canadian Food Guide (cereals, fruits and vegetables, milk products, and meats and substitutes).	1	2	3	4	5
8. I eat foods such as chips, chocolate and candies.	1	2	3	4	5
9. I use caffeine.	1	2	3	4	5
10. I drink water.	1	2	3	4	5
11. I eat fried foods.	1	2	3	4	5

MY BODY WEIGHT GOAL

Please specify the amount of weight you want to loose.

In the next month, I intend to loose _____ pounds lbs or kg.

IMPLEMENTATION INTENTIONS ON WANTED RESPONSES (WR) MANIPULATION

Successful regulation of eating behaviours requires that one initiates and maintains various goal-directed actions (e.g., eat more fruits, eat less fat). Food planning has been found to facilitate the enactment of these actions. Food planning is essential to meet daily requirements and protect you from out-of control eating (Herrin, 2003).

1. It would be useful for you to list 5 good opportunities to act toward goal attainment. Then list a specific wanted action to initiate in the presence of each opportunity.

For example, a participant could have specified these 5 pairs:

At breakfast, I will make sure I eat a dairy product, whole-wheat toasts or cereals, and a fruit.
At the restaurant, I will make the healthiest food choice.
Each Sunday, I will try a new healthy recipe.
When preparing dinner, I will use olive oil.
Each day, I will eat five servings of fruits and vegetables.

Opportunities (when)	Specific wanted actions (When opportunity x arises, then I will perform y ’.)
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____

2. Finally, for the first specified pair, visualize the chosen opportunity. Close your eyes. Visualize and imagine the surrounding of the critical situation. Look around at your surroundings and concentrate on the objects in your environment. What do you see? Imagine how you will respond to the situation. What will you do? Commit yourself to react effectively to it by silently saying: « When situation x arises, then I will perform y ’ ». Repeat this exercise for the other specified pairs.

REMEMBER TO REPEAT THESE TO YOURSELF !!!

You will receive a copy of this page. We encourage you to stick this page where you will often see it during the course of the day (for example, on the refrigerator’s door).

IMPLEMENTATION INTENTIONS ON THE SUPPRESSION OF UNWANTED RESPONSES (SUR) MANIPULATION

Successful regulation of eating behaviours requires that one deals with critical situations that interfere with the goal pursuit. Food planning has been found to prevent unwanted behaviours. Food planning is also essential to meet daily requirements and protect you from out-of control eating (Herrin, 2003).

1. It would be useful for you to list 5 critical situations that may elicit unwanted behaviours (behaviours that will not make you progress toward your goal). Then, specify how you will react (intending not showing the unwanted behaviour, by ignoring the critical situation and by specifying a counter-behaviour.)

For example, a participant could have specified these 5 pairs:

When I am eating at my parents, I will not eat a second portion.

When I pass in front of a bakery, I will ignore the store.

When I am studying and bored, I will drink water instead of soft drinks.

When I see chocolate, chips, candies, I will not succumb to the temptations

When I am too tired to make myself dinner, I will go eat a healthy salad at a restaurant.

Critical situations	How to prevent unwanted behaviours (When situation x arises, then I will perform y ".)
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____

2. Finally, for the first specified pair, visualize the chosen critical situation. Close your eyes. Visualize and imagine the surrounding of the critical situation. Look around at your surroundings and concentrate on the objects in your environment. What do you see? Imagine how you will respond to the situation. What will you do? Commit yourself to react effectively to it by silently saying: « When situation x arises, then I will perform y ". Repeat this exercise for the other specified pairs.

REMEMBER TO REPEAT THESE TO YOURSELF !!!

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Appendix E
Questionnaire 3 for Study 3 (Article 2)

GENERAL QUESTIONS ABOUT THE REGULATION OF EATING BEHAVIOURS
(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

For each of the following questions, please use the scale provided below each of them and circle the appropriate number.

1. To what extent do you **consider yourself successful** in the way you regulate your eating behaviours?

Not at all successful				Moderately Successful			Very successful
1	2	3	4	5	6	7	

2. To what extent are you **satisfied** with the regulation of your eating behaviours?

Not at all satisfied			Moderately Satisfied			Very satisfied
1	2	3	4	5	6	7

2. To what extent is your goal to regulate your eating behaviours **important** to you?

Not at all important			Moderately important			Very important
1	2	3	4	5	6	7

3. To what extent is your goal to regulate your eating behaviours **difficult** for you?

Not at all difficult			Moderately difficult			Very difficult
1	2	3	4	5	6	7

4. To what extent do you feel you have the **skills and resources necessary** to effectively regulate your eating behaviours?

Not at all			Moderately			Very
1	2	3	4	5	6	7

5. To what extent are you **committed** to the regulation of your eating behaviours?

Not at all committed			Moderately Committed			Very committed
1	2	3	4	5	6	7

THE HEALTHY EATING HABITS SCALE
(Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004)

Using the scale from 1 to 5, indicate to what extent you do the different things described in the items listed below.

	Not at all	Sometimes	Most of the time	Often	All of the time
1. I eat vegetables, fruits and grain products (e.g. pastas, cereals, and grain mixtures)	1	2	3	4	5
2. I eat foods that are low in fat, saturated fat, and cholesterol.	1	2	3	4	5
3. I use white sugar.	1	2	3	4	5
4. I use salt.	1	2	3	4	5
5. I consume alcoholic beverages.	1	2	3	4	5
6. I maintain a healthy weight.	1	2	3	4	5
7. I eat a variety of foods from each of the four groups recommended by the Canadian Food Guide (cereals, fruits and vegetables, milk products, and meats and substitutes).	1	2	3	4	5
8. I eat foods such as chips, chocolate and candies.	1	2	3	4	5
9. I use caffeine.	1	2	3	4	5
10. I drink water.	1	2	3	4	5
11. I eat fried foods.	1	2	3	4	5

THE EATING DISORDER EXAMINATION-SELF REPORT QUESTIONNAIRE
(EDE-Q; Fairburn & Beglin, 1994)

1. Would a weight fluctuation of 5 lbs. affect the way you live your life? (circle one)

Not at all	Slightly	Moderately	Very much
1	2	3	4

2. Do you eat sensibly in front of others and splurge alone? (circle one)

Never	Rarely	Often	Always
1	2	3	4

3. Do you give too much time and thoughts to food (circle one)

Never Rarely Often Always
1 2 3 4

4. Do you have feelings of guilt after overeating (circle one)

Never Rarely Often Always
1 2 3 4

5. How conscious are you of what you're eating (circle one)

Never Rarely Often Always
1 2 3 4

6. Do you fear loss of control over eating (circle one)

Never Rarely Often Always
1 2 3 4

THE VITALITY SCALE (Ryan & Frederick, 1997)

Please respond to each of the following statements by indicating the degree to which the statement is true for you in general in your life. Use the following scale:

Not at all true			Somewhat true			Very true	
1	2	3	4	5	6	7	

IN GENERAL IN MY LIFE....

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. I feel alive and vital. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I don't feel very energetic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am preoccupied with other thoughts. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I have energy and spirit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I feel alert and awake. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I am easily distracted. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I am drained. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I feel so alive I just want to burst. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I look forward to each new day. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

10. I feel depleted of energy. 1 2 3 4 5 6 7
11. I feel energized. 1 2 3 4 5 6 7
-

Questions for the intervention conditions

MY USE OF STRATEGIES

For the following questions on the use of strategies, please use the scale from 1 to 5, and circle the appropriate number

1. How often did you use the strategies listed in the last questionnaire?
- | | | | | |
|------------|--------|-----------|-------|------------|
| Not at all | Rarely | Sometimes | Often | Very often |
| 1 | 2 | 3 | 4 | 5 |

Apart from the strategies listed in the last laboratory session.....

2. Did you think about (other) critical situations (e.g., holidays, eating in restaurants) in which you might experience difficulty to make healthy food choices, and how you would specifically react to them?

Not at all	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

3. Did you think about (other) good opportunities, where you could perform specific behaviours in order to achieve healthy eating, and what to do specifically when these opportunities are encountered?

Not at all	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

4. Since the laboratory session, did you seek nutritional information?

Not at all	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

MY ASSESSMENT OF THE STRATEGIES

For the following two questions, please use the scale from 1 to 7, and circle the appropriate number.

1. How would you rate the effectiveness of your strategies in helping you regulate your eating behaviours?
- | | | |
|----------------------|----------------------|---------------------|
| Not at all effective | Moderately effective | Extremely effective |
| 1 2 3 4 5 | 6 7 | |
2. Would you say that taking the time to elaborate your worthwhile strategies was worthwhile?
- | | | |
|-----------------------|-----------------------|----------------------|
| Not at all worthwhile | Moderately worthwhile | Extremely worthwhile |
| 1 2 3 4 5 | 6 7 | |

YOUR EXPERIENCE WITH THE STRATEGIES

Below are statements that deal with the consequences associated with using the strategies you have listed during the last laboratory session. Using the 1-7 scale below, indicate to what extent the item is true for you by circling the appropriate number to the right of each item.

Not at all true		Somewhat true		Very true
1	2	3	4	5
6	7			
1. The strategies helped me with getting started on my goal of healthy eating.				
1	2	3	4	5 6 7
2. The strategies made it easier to incorporate healthy eating habits into my lifestyle.				
1	2	3	4	5 6 7
3. The strategies made it easier to stick to my goal of healthy eating in the face of distraction, temptations and competing goals.				
1	2	3	4	5 6 7
4. The strategies made it easier to size good opportunities to do something about my good intentions to eat better.				
1	2	3	4	5 6 7
5. The strategies made me respond quickly to situations I had anticipated (without hesitations).				
1	2	3	4	5 6 7
6. The strategies made the regulation of eating behaviours easier in general.				
1	2	3	4	5 6 7
7. The fact that I had pre-decided what to do when I would encountered some situations made the performance of the desirable behaviours more automatic.				
1	2	3	4	5 6 7

Thank you very much for your collaboration in this research project.

Questions for the control condition:

For the following questions on the use of strategies, please use the scale from 1 to 5, and circle the appropriate number

1. Did you think about critical situations (e.g., holidays, eating in restaurants) in which you might experience difficulty to make healthy food choice, and how you would specifically react to them?

Not at all	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

2. Did you think about good opportunities, where you could perform specific behaviours in order to achieve healthy eating, and what to do specifically when these opportunities are encountered?

Not at all	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

3. Since the laboratory session, did you seek nutritional information?

Not at all	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

Thank you very much for your collaboration in this research project.