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Simon Beaudry
AUTEUR DE LA THÈSE / AUTHOR OF THESIS

Ph.D. (Psychology)
GRADE / DEGREE

School of Psychology
FACULTÉ, ÉCOLE, DÉPARTEMENT / FACULTY, SCHOOL, DEPARTMENT

On Monitoring and Motivation in the Self-Regulation of Behavior: The Roles of Self-Awareness, Self-Consciousness and Self-Determination in the Context of Dieting and Weight Management

TITRE DE LA THÈSE / TITLE OF THESIS

Luc Pelletier
DIRECTEUR (DIRECTRICE) DE LA THÈSE / THESIS SUPERVISOR

CO-DIRECTEUR (CO-DIRECTRICE) DE LA THÈSE / THESIS CO-SUPERVISOR

Céline Blanchard

Alain Desrochers

Patrick Gaudreau

Heather Patrick
National Cancer Institute, MD

Gary W. Slater
Le Doyen de la Faculté des études supérieures et postdoctorales / Dean of the Faculty of Graduate and Postdoctoral Studies

On Monitoring and Motivation in the Self-Regulation of Behaviour: The Roles of Self-Awareness, Self-Consciousness and Self-Determination in the Context of Dieting and Weight Management

Simon G. Beaudry

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ABSTRACT

Why are some goal pursuits more successful than others? What personal variables help achieve successful self-regulation? The goal of the present program of research is to investigate the relationships between two important components of effective self-regulation: motivation and monitoring. This dissertation suggests that an organismic approach to self-regulation such as self-determination theory (SDT) can supplement the view brought forward by control theory's (CT) mechanistic self-monitoring system, by proposing that people may have different regulation styles based on their motivational orientation. More specifically, it is argued that SDT and CT may be in congruence with regard to general dispositional styles of monitoring and motivation, such that that public self-consciousness may be associated with a nonself-determined motivational orientation, while private self-consciousness may be associated with a self-determined motivational orientation. However, it is also argued that SDT and CT make different predictions with regard to the effects of situational manipulations of public and private self-awareness, and that these effects may influence people differentially based on their motivational orientation. It is hypothesized that: (a) conditions conducive to private self-awareness affect individuals with self-determined and nonself-determined motivational orientations differently as they become more aware of their respective personal style of behavioural regulation and their different personal goals (i.e., intrinsic versus extrinsic goals respectively), and (b) conditions conducive to public self-awareness create a controlling environment and lead individuals with both self-determined and nonself-determined motivational orientations to focus on self-presentation, their public image and the ways others perceive them. To test these ideas, a series of four studies is proposed to answer a progression of research questions using survey

and laboratory methodologies. Results from a meta-analysis (Study 1) and structural equation modeling (Study 2) reveal that private self-consciousness is associated with higher levels of global self-determination and that public self-consciousness is associated with lower levels of global self-determination, across various samples. Public self-consciousness and low global self-determination also appear jointly related to detrimental self-regulatory functioning such as setting goals that are incoherent with the self, while private self-consciousness and high global self-determination appear related to positive self-regulatory functioning such as setting goals that are coherent with the self (Study 2). Furthermore, findings suggest that a situational increase of private self-awareness has a strong impact on the self-regulatory functioning of individuals with low levels of global self-determination as they become more aware of their extrinsic goals and behave in coherence with these goals, but little impact on individuals with high levels of global self-determination as this condition matches their style of regulation and their behaviour is already in coherence with their intrinsic goals (Study 3). Conversely, a situational increase in public self-awareness appears to have a strong impact on the self-regulatory functioning of individuals with high levels of global self-determination, as this condition pressures them to adopt a different way to regulate their behaviour, but a weaker impact on individuals with low levels of global self-determination, as this condition corresponds to their style of regulation (Study 4). Overall, this program of research constitutes a notable contribution to the extant literature on self-monitoring, self-determination, and behavioural self-regulation. Findings suggest that people with different motivational orientations may have different regulation styles, and that these styles could dictate how self-monitoring affects their self-regulation.

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CHAPTER ONE:

INTRODUCTION

Statement of the problem

Every day, people set goals for themselves and yet, many fail to adopt the behaviours necessary to achieve them. Whether the goal is to lose weight, recycle more products, or to exercise regularly, why are some individuals more successful than others in following through with their goals?

In social psychology, researchers often use the expression *self-regulation* to convey the idea of the self's capacity to alter its own behaviours (Vohs & Baumeister, 2004). Self-regulation has been further defined as the attainment of personal goals by planning and adapting self-generated behaviours (Zimmerman, 2000). Across the various definitions of self-regulation, researchers agree that it refers to the direction of behaviours *of* the self, *by* the self. Using these propositions, in the context of the present dissertation, self-regulation is more specifically defined as the process through which humans manage their behaviour to guide it toward a specific objective (Vohs & Baumeister, 2004, Carver & Scheier, 1998, Zimmerman, 2000). In this view, successful self-regulation constitutes a coherent behaviour-goal combination, such as cutting back on junk food (behaviour) to lose weight (goal). Conversely, self-regulation failure constitutes an incoherent behaviour-goal combination, such as eating large amounts of junk food while aiming to lose weight. Defined as a "process", self-regulation is considered to be dynamic and as incorporating different components. The relative importance of each component, as well as the mechanisms through which they are hypothesized to contribute to self-regulatory functioning, is contingent on two different points of view: the mechanistic approach and the organismic approach.

The overarching goal of the present dissertation is to examine and integrate specific propositions stemming from these two views. The mechanistic system takes the machine as a referent for behaviour, suggesting that the source of action stems from a series of interconnected, but independent, parts that require some form of outside influence. The organismic system takes the living organism as a referent for behaviour, suggesting that the source of action stems from an inherent tendency to grow and function as a whole. Mechanistic and organismic views of self-regulation propose complementary but sometimes differing ways in which the process of self-regulation may lead to success versus failure. For instance, from a mechanistic point of view (e.g., Carver & Scheier, 1981, 1998), behaviour-goal coherence is generally thought to operate through a cognitive and emotional comparator function, a cybernetic-inspired feedback loop, which makes use of *self-monitoring* to guide behaviour. In contrast, the organismic point of view (e.g., Deci & Ryan, 1985a, 2000) suggests that behaviour-goal coherence operates through a form of *organismic integration*, which is a natural propensity to grow and integrate behaviours within the self, fostered by the satisfaction of basic psychological needs.

The present dissertation examines both approaches and tests propositions based on each view with regard to self-regulation and its correlates. To achieve this goal, the concept of self-regulation will be more explicitly addressed. Then, a detailed description of a leading mechanistic view of self-regulation will be provided by reviewing the tenets of control theory (Carver & Scheier, 1981, 1998) and a detailed description of a leading organismic view of self-regulation will be provided by reviewing the tenets of self-determination theory (Deci & Ryan, 1985a; 2000). This will be followed by an in-depth look at how mechanistic and organismic concepts have been integrated in contemporary research with regard to self-

regulation and its correlates. In light of this discussion, a series of studies is proposed to investigate specific aspects of the inter-connection between the two approaches.

Self-Regulation

There are a number of contemporary research programs centered on self-regulation theories. The notion that psychology should be interested in the human capacity to direct one's own behaviour, however, is not new. Preliminary research and arguments date back to early critiques of behaviourism by Thorne in 1946. In the 1970s, pioneer work by Kanfer and Karoly (1972) argued that "self-control" was not metaphysics and should be included in theories of human behaviour. They introduced concepts such as self-monitoring in a closed-loop model. This, and other similar work, (e.g., Duval & Wicklund, 1972) led to the seminal contributions of Carver and Scheier (Carver, 1979; Carver & Scheier, 1981) and the development of their feedback loop model. Inspiring themselves from cybernetics, they proposed a series of arguments regarding goal-directed behaviour that included the importance of self-monitoring and the hierarchical structure of goals. These arguments stimulated decades of research on self-regulation. More recently, contributions by Baumeister and colleagues (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998) have led to the introduction of the ego-depletion model. Their model, which conceptualizes self-regulation as an energy-demanding process drawing from a finite resource, has significantly influenced self-regulation theories and has inspired hundreds of laboratory experiments (for a review, see Beaudry, 2010; Hagger, Wood, Stiff, & Chatzisarantis, 2010).

Through this program of research, a consistent idea has transpired: efficient self-regulation is believed to be associated with optimal psychological functioning. What are the necessary conditions of successful self-regulation?

Basic ingredients

For self-regulation to be effective, researchers have identified four necessary ingredients: the presence of standards, monitoring, strength, and motivation (Baumeister, Heatherton & Tice, 1994; Baumeister & Vohs, 2007).

Standards refer to the objective or the goal of the self-regulation process. The standard of a self-regulatory effort is thus the reference value towards which the behaviour is guided. Given that self-regulation is thought of as a process to explain goal-directed behaviour, establishing a well-defined goal, whether consciously or not, is essential. Research on goals and behaviour has supported this idea by showing the positive impact of clear, coherent, and challenging goals in contrast to conflicting or suboptimal standards (Emmons & King, 1988; Locke & Latham, 1990, 2002).

Next, there needs to be a dynamic source of informative feedback on the discrepancy between the current state and the reference value. The role of monitoring is to keep track of this discrepancy and provide feedback on one's progress toward the standard. If the discrepancy persists, further self-regulation is needed; if the standard is reached, then self-regulation is no longer needed. The self-monitoring component of self-regulation has been explored in great detail by Carver and Scheier (1981, 1998) and their feedback-loop model of behaviour.

As most goal-directed behaviours require some level of effort, researchers have suggested that self-regulation may depend on some form of strength to be effective. Without

strength, the self-regulation process is believed to be thwarted. Some have argued that this strength may come from a limited resource of energy (Baumeister et al., 1998; Muraven & Baumeister, 2000). Others have suggested that this strength is a personal capacity that may come from a feeling of personal agency and self-efficacy (Bandura, 1986; Zimmerman & Martinez-Pons, 1992).

A more recent emphasis has brought motivation into perspective as a necessary ingredient for self-regulation. Some researchers have conceived motivation as varying only in terms of quantity, such that self-regulation is effective "when motivation is high" (Baumeister & Vohs, 2007, p. 118). In contrast, other researchers have suggested that the type or quality of motivation, the extent to which the behaviour has a more or less internal versus external locus of causality, has a significant influence on the outcome of self-regulation (Ryan & Deci, 2006, 2008).

Throughout the literature on self-regulation, there is empirical evidence to support the role of each of these ingredients. Although each component has been deemed necessary, it is argued that certain components "may compensate more or substitute for each other to some degree" (Baumeister & Vohs, 2007, p.117). Accordingly, one may wonder how motivation, which has only recently been considered a key ingredient (Baumeister & Vohs, 2007), may compensate or interact with the other components of self-regulation. It is to that extent that the distinction between the mechanistic approach and the organismic approach to self-regulation becomes interesting.

This dissertation's review of the literature on the role of motivation in connection to each of the other self-regulation ingredients suggests that an organismic approach, such as the one proposed by self-determination theory (Deci & Ryan, 1985a; 2000), can contribute

significantly to the understanding of self-regulation which is currently dominated by the more traditional mechanistic approach. Before specifically discussing these intersections (i.e., motivation and standards, motivation and strength, motivation and self-monitoring), an overview of the assumptions of each approach and how they apply to self-regulation is warranted. The next two sections will provide a review of two important meta-theories that characterize each view.

Control Theory: A Mechanistic Approach to Self-Regulation

The cybernetic control-process model proposed by Carver and Scheier (CT; 1981, 1998) has led to a generalized mechanistic view of self-regulation. Internal processes have been hypothesized to operate via a "feedback loop" model, comprised of TOTE units (Test-Operate-Test-Exit), and ostensibly function independently from motivation. The feedback loop is organized in a way similar to a thermostat (Caver & Scheier, 1998): an input function (e.g., the current state) is compared to a reference value (e.g., a goal), an operation is carried out in an output function (e.g., self-regulation), which eventually leads to another input function for a subsequent loop (e.g., the new state). Accordingly, a plausible explanation for the effectiveness of self-regulation based on this approach is the extent to which it is possible to properly monitor oneself.

On Monitoring the Self

There has been debate in psychology with regard to the role of consciousness in guiding behaviour. Some researchers have suggested that conscious processing is altogether unnecessary to initiate behaviour (Bargh & Chartrand, 1999; Libet, 1985). Others have argued that one's conscious reflections on the self are often erroneous (Nisbett & Wilson, 1977; Wegner, 2002). The increasing evidence portraying the fallacies of conscious

processing has lead many researchers to criticise its usefulness in the guidance of behaviour. More recently, however, Baumeister and Masicampo (2010) have suggested that conscious thought may play a more indirect, but vital, role on human behaviour. They proposed that consciousness may facilitate the creation of articulate narratives and serve the self through the simulation of events. Pertaining to the role of consciousness more specifically for self-regulation, Baumeister and Masicampo (2010) suggested that "by simulating distal outcomes, it can activate relevant motivations" (p.962). In other words, conscious thought may be important to the extent that it can help monitor one's plans and style of regulating behaviours. Increasing one's self-monitoring via more conscious thinking could thus lead to more success in self-regulation.

Early research by Duval and Wicklund (1972) on self-awareness supports this idea. They suggested that people were more inclined to reduce the discrepancy between the self and a standard when the saliency of that discrepancy was made conscious via self-focused attention. For instance, if the goal was to lose weight, self-regulation should be more effective when individuals are made aware of the discrepancy between an aspect of their self (e.g., being overweight) and a standard (e.g., not being overweight). Carver and Scheier expanded on this idea and demonstrated that there were both private and public aspects to the self (Carver & Scheier, 1984; Scheier & Carver 1983) that were called upon when operating consciousness. The two facets were not theorized to be in opposition to one another, but rather to make separate factors salient. The term *self-awareness* was chosen to refer to the situational manifestations of these private and public aspects, while the expression *self-consciousness* was used to refer to their more dispositional orientations.

Self-awareness

It was thought that the distinctions between the private and public sides of the self could be made salient in situational contexts by activating different aspects of conscious thought (Carver & Scheier, 1984). Several instances of experimental manipulations have provided empirical support for the existence of the private-public distinction and for their differential effect on behaviour.

Scheier and Carver (1977) have shown that private self-awareness, via the presence of a mirror, could make individuals more aware of their affective experiences. Further research has suggested that a situational increase in private self-awareness led individuals to be more resistant to social pressures and to be more inclined towards their own opinions and attitudes (Froming, Walker & Lopyan, 1982; Scheier & Carver, 1980). It is noteworthy to mention that, while the first experimental manipulations of private self-awareness made use of a mirror (Froming, Walker & Lopyan, 1982; Scheier & Carver, 1977, 1980), more recent research has argued that the mirror may reflect parts of the self that are publicly observable and thus may also increase public self-awareness (Hofmann & Heinrichs, 2002; Wiekens & Stapel, 2008). Regardless of how it is manipulated, Carver (2003) has suggested that, in general, people appear to focus on self-aspects and personal attitudes while in a state of private self-awareness. To connect with the propositions of Baumeister and Masicampo (2010), people may be more likely to focus on their own personal style of self-regulation (their own plans, narratives, motivations, etc.) when in a state of private self-awareness.

In the case of public self-awareness, experimental manipulations have suggested that the presence of an evaluative audience (Froming, Walker & Lopyan, 1982) or a recording camera (Scheier & Carver, 1980) can make individuals selectively more aware of their public self. Research has provided evidence that in a state of public self-awareness,

participants were more likely to adopt behaviours concordant with their perceptions of social norms and external standards, regardless of their personal opinion (Froming, Walker, & Lopyan, 1982). To connect with the propositions of Baumeister and Masicampo (2010), people may be more likely to focus on external standards for the regulation of their behaviour when in a state of public self-awareness.

Overall, research has suggested that increasing one's self-awareness may be beneficial for self-regulation, but that this increase may operate differentially if private or public aspects are incited. Increasing private self-awareness appears to bring consciousness to one's style of self-regulation, while increasing public self-awareness appears to bring consciousness to external standards and controls. These differential roles of the private and public sides of the self have also been suggested to operate at a more dispositional level.

Self-consciousness

Carver and Scheier (1984) introduced novel contributions by elaborating their ideas on the study of self-focus in terms of individual differences. It was thought that people could be more or less inclined toward one side of the self or the other from a stable and dispositional standpoint. In turn, this dispositional orientation should have an impact on how people perceive themselves and how they interact with their surroundings. The development and validation of the Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975; Scheier & Carver, 1985) provided interesting evidence in support of these two distinct facets of the self.

The private self is thought to relate to one's personal and intimate beliefs. It is associated with one's values, feelings, and attitudes, in addition to being centered on one's personal needs (Scheier & Carver, 1983). People high in private self-consciousness have

been characterized as acting independently of social pressures (Scheier & Carver, 1983; Schlenker & Weigold, 1990). The dispositional orientation towards private self-consciousness also makes it more likely for individuals to have a chronic accessibility to thoughts about the self, thus increasing their accuracy when describing self-aspects (Carver & Scheier, 1984). In addition, research has suggested that the behaviour of individuals high in private self-consciousness is usually more consistent with their privately endorsed attitudes (Fenigstein, 1987; Scheier & Carver, 1983).

In contrast, the public self is related to a locus of attention that is centered on how others view the self. It is associated with self-presentation, impression management, as well as external pressures and control (Scheier & Carver, 1983). Dispositional orientations towards public self-consciousness have been associated with higher levels of conformism (Fenigstein, 1987, Carver & Scheier, 1984). In addition, individuals showing higher levels of public self-consciousness appear to be faster when judging personal physical attributes (Turner, Gilliland, & Klein, 1981).

Summary

Overall, the self-monitoring hypothesis suggested by this mechanistic view of self-regulation has provided good insight into the mechanisms which guide the self in goal-directed behaviour. Based on this view, an increase in conscious thought should be beneficial for self-regulation. It is plausible that a focus on the private self, whether in a disposition via self-consciousness or in a situation via self-awareness, could be beneficial for self-regulation, as it provides an easier access to one's personal style of functioning (Baumeister & Masicampo, 2010; Carver & Scheier, 1984). A focus on the public self also involves an increase in conscious thoughts about the self. However, this is typically centered

on standards that are external to the individual, such as social norms and self-presentation preoccupations, and could in some instances be counterproductive to self-regulation. There is theoretical and empirical evidence to illustrate this point. For instance, the public self has been associated with socially prescribed perfectionism (Saboonchi & Lundh, 1997) and a higher prevalence of eating disorders (Schutz, Paxton, & Wertheim, 2002), both of which are correlates of ineffective self-regulation (Tangey, Baumeister, & Boone, 2004).

In spite of the noteworthy contributions of the literature reviewed in this section, a question remains unanswered "How could we explain that some individuals are more oriented towards the private aspects of the self while others are more oriented towards the public aspects of the self?" The correlates of the two aspects of the self have been well described, but there has been little theorizing on the development of their distinction. It appears that the mechanistic point of view, or at least control theory (Carver & Scheier, 1981, 1998), falls short of explaining how this distinction could arise in the first place. The organismic approach, conversely, offers interesting directions to explore this question, as it considers the organisms' natural tendency to develop itself. This contrast is best understood from the point of view of self-determination theory (Deci & Ryan, 1985a; 2000) which portrays this inherent growth tendency as a form of organismic integration. Self-determination theory suggests that, with the satisfaction of basic psychological needs, people naturally internalize external values and norms, and integrate them into their sense of self. This is viewed as a tendency toward self-determination. Accordingly, the extent to which one's values and goals are internalized could be associated with different consequences with regard to the public and private aspects of the self. To explore this proposition in detail, the next section reviews the basic postulates of self-determination theory.

Self-Determination Theory: An Organismic Approach to Self-Regulation

Self-determination theory (SDT; Deci & Ryan, 1985a, 2000) is meta-theory of human behaviour established on the idea that people are dynamic organisms with an inherent tendency to grow and master their environment. According to SDT, people grow and flourish in environments that support their basic psychological needs for autonomy, competence, and relatedness. Different sub-components of SDT ("mini-theories") address how the fulfilment of basic psychological needs affects behaviour and motivation. Two of these mini-theories are particularly relevant to the present discussion: cognitive evaluation theory (CET) and organismic integration theory (OIT).

On one hand, CET is specific to intrinsic motivation, and suggests that this natural propensity is sensitive to the individual's social context. Intrinsic motivation, i.e., behaviours that are carried out for their own sake, may be encumbered by controlling environments, extrinsic rewards, and contexts that thwart basic psychological needs (Deci, Koestner, & Ryan, 1999).

On the other hand, OIT addresses the subject of extrinsic motivation, i.e., instrumental behaviours intended toward a goal apart from the behaviour itself. Extrinsic motivation is suggested to exist in numerous forms, varying in the degree to which they are *internalized* into a coherent sense of self (Deci & Ryan, 1985a). As their motivation becomes more internalized, individuals are thought to feel more autonomous, or self-determined, in their behaviour. OIT also emphasizes the importance of basic psychological needs, suggesting that they play a critical role in behaviour by fostering the internalization of motivation. Extrinsic motivation is postulated to be comprised of four different sub-types of motivation. Behaviours judged to be consistent with the self and congruent with one's

values, but not carried out for intrinsic reasons, constitute the essence of integrated motivation. Less autonomous behaviours that are still accepted as being personally important by the individuals who carry them out are considered examples of identified motivation. Behaviours driven by guilt or internally imposed constraints are examples of more controlled and nonself-determined forms of motivation making up introjected motivation. Even more controlling and less autonomous behaviours based exclusively on rewards or external constraints are thought to form external motivation.

Intrinsic motivation, extrinsic motivations and amotivation (i.e., instances where there is no intentional regulation of behaviour or where there is no contingence between one's goals and behaviours) can be seen as constituents of a *self-determination continuum.* The extent to which motivational orientation is self-determined or nonself-determined is thought to change along this continuum in terms of relative autonomy and internalization (Ryan & Deci, 2000). Internalization is a central tenet to SDT, suggesting that the different forms of motivation can be more or less integrated into a coherent sense of self. More explicitly, as the relative autonomy of one's motivation decreases (intrinsic to integrated, identified, introjected, external, and amotivated), motivation is said to become less *self-*determined (Ryan & Deci, 2000) and more *nonself-*determined. The premises of SDT and the self-determination continuum have been applied in many domains, suggesting that more self-determined motivational orientations are associated with positive outcomes in terms of psychological health and functioning, whereas less self-determined (or more nonself-determined) motivational orientations are associated with negative outcomes (Deci & Ryan, 2008).

Together, CET and OIT propose that behaving in a more autonomous and self-determined manner represents optimal psychological functioning, as behaviours become integrated into a coherent sense of self (Deci & Ryan, 1991; Ryan & Deci, 2000). Stated differently, when motivation is self-determined, both goals and behaviours are internalized within the autonomous self and are thus more likely to be coherent with one another. When motivation is nonself-determined, goals and behaviours are not internalized and the self is controlled by external factors, thus making goals and behaviours more prone to incoherence (Ryan & Deci, 1999). Research has provided evidence of this proposition, suggesting that self-determined behaviour is endorsed by the self and thus more consistent with one's attitudes, whereas this consistency is reduced when behaviour is nonself-determined (Koestner, Bernieri, & Zuckerman, 1992).

In sum, the postulates of SDT may have important implications for the study of self-regulation, namely with regard to how the organismic integration of goals and behaviours within the self is conceptualized. Could stronger coherence between behaviours and goals, as fostered by self-determination, be associated with more successful self-regulation? Research addressing this question is covered next.

Self-Determination and Self-Regulation

Several researchers have suggested evidence that self-determined goal pursuit may be related to more successful self-regulation (and thus, more positive behavioural outcomes vs. more negative behavioural outcomes), while nonself-determined goal pursuit may be related to self-regulatory failure (Moller, Deci & Ryan, 2006; Muraven, Gagné, & Rosman, 2008; Nix, Ryan, Manly & Deci, 1999). One plausible explanation for these findings has pointed to the idea that self-determined goal pursuit is associated with stronger behaviour-attitude

coherence (Koestner et al., 1992). The association between self-determination and effective self-regulation has been replicated across several domains. With regard to personal health, studies have suggested that more self-determined motivation predicted better self-regulation of exercise, tobacco cessation, and diet (Williams, McGregor, Sharp, Levesque, Kouides, Ryan, et al. 2006; Williams, McGregor, Zeldman, Freedman, & Deci, 2004). Researchers have also applied the tenets of SDT to eating self-regulation more directly (Mata, Silva, Vieira, Carraca, et al., 2009; Pelletier & Dion, 2007). A similar trend can be observed with the self-regulation of pro-environmental behaviours (Green-Demers, Pelletier, & Menard, 1997), the self-regulation of prejudice (Legault, Green-Demers, Grant, & Chung, 2007), and the self-regulation of destructive behaviours in close relationships (Knee, Lonsbary, Canevello, & Patrick, 2005), to name a few. Overall, research has suggested that a more self-determined motivational orientation may foster more effective self-regulation.

Global Self-Determination

Some researchers have suggested that self-determination could be studied in terms of individual differences at a more general, or global, level (Vallerand, 1997; Vallerand & Ratelle, 2002). The hierarchical model of intrinsic and extrinsic motivation (Vallerand, 1997) postulates that self-determination can be conceived to operate on three distinct levels: situational (specific to a current activity), contextual (specific to a life domain), and global. At the global level, self-determination is thought to be a relatively stable trait. As such, examining individuals in terms of their dispositional orientations of self-determination, or in other words, why they generally do what they do can serve as an interesting characteristic. It is suggested that having a more self-determined motivational orientation at the global level is

associated with more self-determined motivational orientations at different contextual levels (Vallerand, 1997).

Summary

Self-determination theory proposes a framework that can contribute to the understanding of successes and failures of self-regulation. Based on the literature reviewed in this section, it is reasonable to believe that more self-determined forms of motivation could be associated with more effective self-regulation as they foster an organismic integration that increases the coherence between one's behaviours and goals. In contrast, less self-determined forms of motivation could be postulated to act in the opposite way as they are related to styles of regulation where the behaviours and goals are incoherent, thus more susceptible to self-regulatory failure.

The literature reviewed so far suggests that the mechanistic and organismic views of self-regulation may not be mutually exclusive. Carver and Scheier (2000) have suggested that "the cybernetic (...) and the humanistic-organismic share a great deal. Further explorations of their intersection can only enrich both of them." The main goal of this dissertation is to propose a complementary framework which includes propositions from both control theory and self-determination theory, by exploring more specifically how self-monitoring (as defined by control theory) and organismic integration (self-determination theory) are inter-connected in the prediction of successful self-regulation.

With the exception of the connection between motivation and self- monitoring, there is existing theoretical and empirical evidence that organismic propositions from self-determination theory have contributed to the understanding of self-regulation, by suggesting how motivation is inter-connected with the other two self-regulation ingredients (standards

and strength). In order to better understand how the organismic and mechanistic approaches interact with one another at the level of monitoring, it would be useful to first explore how they have been integrated in research so far with regard to each ingredient.

Organismic Contributions to Mechanistic Views of Self-Regulation

The philosopher John R. Searle has advocated: "it is a mistake to suppose that the mind is a computer program" (Searle, 1998, p.7). He submits that "syntax is not semantics", suggesting that computational models of human behaviour inherently leave something out. While Searle (1998) is referring to human consciousness in this context, his argument is also applicable in the comparison of the mechanistic and organismic approaches treated in this dissertation. From an organismic perspective, a purely mechanistic approach to self-regulation *inherently leaves something out.* To support this assertion, the present section reviews how organismic perspectives have contributed to the understanding of self-regulation by supplementing mechanistic views with regard to the connection between motivation and standards, as well as motivation and strength. The association between motivation and the other ingredient, monitoring, remains to be explored in detail. Based on this review, principles are proposed to explain how an organismic perspective, such as self-determination theory, could contribute to the understanding of self-regulation by exploring the possible interaction of motivation and self-monitoring.

On Standards and Motivation

Goal setting involves establishing a standard or objective to serve as the aim of one's actions (Zimmerman, 2000). The literature on goals has greatly benefited from the mechanistic point of view, focusing mainly on goal content and structure. Control theory views goals as hierarchical (Carver & Scheier, 1998, 1999), varying in their level of

abstraction. As such, some goals are deemed more important than others. Goal hierarchy has helped explain how goals relate to one another in the self-regulation of behaviour. More explicitly, effective self-regulation is thought to function by the satisfaction of specific goals which themselves lead to the satisfaction of higher-order goals.

While providing useful insight on how goals relate to one another, these propositions do not suggest anything about goal *content*. Goal setting theory, however, (Locke & Latham, 1990, 2002) has made propositions focused on the content of goals. According to this work, goals that are clearer and more difficult are positively associated with task performance. Assuming that task performance as defined by goal setting theory is commensurate to self-regulation, effective standards should thus be clear, challenging, and attainable (Locke & Latham, 1990). Furthermore, goal setting theory suggests that goals are more efficient when they are provided with commitment and feedback. However, their theory does not provide a clear rational as to why commitment and feedback are important to standards.

The organismic perspective put forward by SDT can extend the assumptions and findings described above in several ways. For instance, the reason why commitment and feedback appear important to effective standards may be because they are related to basic psychological needs. A sub-component of SDT, goal contents theory, suggests that goals can satisfy the basic psychological needs of autonomy, competence, and relatedness in different ways and, as such, can lead to different consequences. Goals that can lead to the satisfaction of basic needs, or that are congruent with organismic integration, are considered intrinsic goals, while goals that are dependent on external rewards are considered extrinsic goals (Kasser & Ryan, 1993, 1996). Although most studies on the intrinsic-extrinsic distinction have focused on well-being outcomes, some researchers have more recently extended these

outcomes to self-regulation in the field of education, such as higher persistence at learning activities (Vansteenkiste, Lens, & Deci, 2006). It has been suggested that intrinsic goals, rather than extrinsic goals, are related to deeper cognitive processing and more persistent learning, because intrinsic goals are related to a mastery achievement orientation. Further research has suggested that goal content (intrinsic versus extrinsic) and goal motives (self-determined orientation) contribute independently to behaviour (Sheldon, Ryan, Deci, & Kasser, 2004). These findings have also been extended in experimental manipulations on planning, to suggest that plans implemented in an autonomy-supportive, or a more self-determined, manner yielded more success than plans implemented in a controlling, or a less self-determined, context (Koestner, Horberg, Gaudreau, et al., 2006; Koestner, Lekes, Powers, & Chicoine, 2002; Powers, Koestner, & Topciu, 2005).

Overall, both the mechanistic and organismic approaches agree that standards are necessary for effective self-regulation. However, the organismic perspective put forward by SDT has also suggested that (a) goal content can be extended to consider individuals' striving in terms of the intrinsic-extrinsic distinction and (b) that motivation and goal content jointly and independently contribute to effective self-regulation. Moreover, the organismic perspective adds to the understanding of the role played by standards or goals by suggesting that different consequences can follow from trying to achieve goals with different content. Accordingly, motivation plays an important role in conjunction with standards as the consequences associated with intrinsic and extrinsic goals may differ because they involve separate mechanisms with regard to the ways goals are pursued. These motivational distinctions also appear to play a role when interacting with another self-regulation ingredient: self-regulatory strength.

On Strength and Motivation

Studies have suggested that people may have a limited capacity to self-regulate (Baumeister et al., 1994). This hypothesis implies that the self should use its resources for acts of self-regulation and that self-regulation should be difficult and impaired once the capacity is drained. This strength model of self-regulation has received much empirical support (Baumeister, Vohs & Tice, 2007). Research from multiple laboratory experiments has suggested that carrying out a first self-regulation task affects participants' performance on a following self-regulation task. It has been suggested that the impaired performance is due to the depletion of psychological energy reserves (Baumeister et al., 1998).

The study of motivation from an organismic perspective, particularly self-determination theory, has challenged these findings to some extent. Ryan and Deci (2006) have argued that self-regulation carried out for self-determined reasons (what they termed "autonomous regulation"), should not be draining as behaviours are integrated within one's sense of self. Accordingly, only self-regulation carried out for nonself-determined reasons ("heteronomous regulation") should be draining. Empirical findings in a laboratory setting have also supported this claim (Moller et al., 2006). The interaction between motivation and strength has been further examined in a series of studies by Sharp (2008), suggesting that self-regulation may only be draining when carried out for more controlling and nonself-determined motivations.

Overall, similar to its impact on the understanding of standards, the organismic point of view conveyed by self-determination theory has extended the understanding of self-regulation in terms of its strength component. The organismic perspective suggests that, above and beyond the mechanistic functioning of strength and standards, the reasons *why*

people engage in goal-directed behaviour may involve different styles of regulation, and thus different outcomes. Although there has been little research on the interaction between motivation and monitoring, there is sufficient conceptual and empirical evidence to conceive that the distinct styles of regulation discussed so far may also be associated with differences in the ways individuals monitor their progress toward a goal.

On Monitoring and Motivation

SDT posits that individuals who engage in behaviours for reasons that are autonomous and self-endorsed (self-determined motivation) are more likely to be effective in reaching their goals. In contrast, individuals who engage in behaviours for controlling reasons (nonself-determined motivation), such as rewards or internal constraints, are less likely to be effective in reaching their goals. As explained earlier, the underlying principle that guides this is organismic integration. Behaviours that become more integrated with the self are more volitional, they reflect one's core values and interests, and have an internal perceived locus of causality. Thus, regulation that is self-determined reflects a better integration with the self and has been demonstrated to lead to positive outcomes across numerous life domains (for a review, see Ryan & Deci, 2006). Regulation that is nonself-determined reflects low levels of integration or no integration with the self.

Carver and Scheier (2000) argued that organismic integration is commensurate to "discrepancy-reducing feedback loops", given that the reduction of discrepancy aims at maintaining coherence within the self. Conscious thought plays an important role in this process because it is precisely when individuals are aware of a discrepancy that they become motivated to reduce it and regulate their behaviours. Research has shown that increases in self-awareness are related to an improvement of self-regulation (Carver & Scheier, 1981;

Scheier & Carver, 1977) even after impairments such as social rejection (Baumeister, DeWall, Ciarocco, & Twenge, 2005). In contrast, low self-awareness reflects a state where monitoring is not efficient and cannot readily evaluate goal progress. For this reason low self-awareness has been associated with impaired self-regulation (Carver & Scheier, 1998; Pyszczynski & Greenberg, 1987). Based on these findings, self-awareness (whether private or public) appears to be an important factor in successful self-regulation.

According to SDT, integration of behaviour results in greater coherence within the self because actions that are internalized are performed for their own sake; in other words, they are self-determined *regardless* of whether or not they are monitored by the self. Conversely, actions which are not internalized within the self are not self-determined and are less likely to be coherent with the self, regardless of whether or not they are monitored (Ryan & Deci, 1999). Because individuals with a self-determined and a nonself-determined motivational orientation rely on different processes to regulate their behaviour, it is postulated that they should differ considerably in terms of (a) where they focus their attention and (b) the importance that self-awareness plays in the successful regulation of their behaviour.

The conceptual connections between self-determination and self-monitoring (self-consciousness and self-awareness) outlined in this dissertation are represented in Table 1. First, at the dispositional level, a more self-determined style of regulation should be associated with a more private style of attention to the self given that both foster coherence within the self. A nonself-determined style of regulation should be associated with a more public style of attention to the self as both concern attention oriented towards one's surroundings. This hypothesis is supported by previous research on general causality

orientations (Deci & Ryan, 1985b). More specifically, findings have suggested that a general causality orientation toward autonomy was associated with private self-consciousness, but not with public self-consciousness. Moreover, it was also suggested that a control causality orientation, rather than an autonomy causality orientation, was associated with public self-consciousness. Similar findings are expected with regard to global self-determination. This overarching hypothesis is presented in column A of Table 1.

Second, at the situational level, an increase in self-awareness should affect individuals differently depending on their motivational orientation. In agreement with Baumeister and Masicampo (2010) who suggest that conscious thought should facilitate internal narratives and activate different motivations, and Carver and Scheier (1998) who suggest that private self-awareness should foster a focus on personal attitudes and goals, it is postulated that a situational increase in private self-awareness should lead individuals to focus on their personal motivational style of self-regulation. In other words, it should help people think about *why* they are doing what they are doing. This hypothesis is supported by previous research suggesting that people's motivational orientation may have an impact on the extent to which they are aware of, and have access to, aspects of their inner selves (Koestner et al., 1992). More explicitly, it has been suggested that a more self-determined orientation should be associated with "more self-awareness" while a nonself-determined orientation should be associated with "little or no self-awareness". It is noteworthy that this research did not explore the distinction between private self-awareness and public self-awareness as conceptualized in the current thesis; self-awareness was rather defined along the same lines as described by Baumeister and Masicampo (2010) in terms of access to internal thoughts and narratives. In the present context, this is postulated to reflect private

self-awareness. Consequently, an increase in private self-awareness should be beneficial for individuals with a nonself-determined motivational orientation as it should bring the content of their motivational orientation into focus and thus increase the coherence of their goal-directed behaviour. Conversely, an increase in private self-awareness should have little or no effect for individuals with a more self-determined motivational orientation as it should activate a content that is already coherent with the self. This hypothesis is illustrated in column B of Table 1.

As Carver and Scheier (1998) have suggested, situational increases of public self-awareness should also be somewhat useful for individuals, as they raise awareness of one's actions by setting an attentional focus on how others perceive them. Because a situational increase of public self-awareness induces a focus on social norms and conformity, it should have little or no effect on individuals with a nonself-determined motivational orientation, as their behaviour is already guided by external standards and pressures. Conversely, this increase in self-awareness should have a stronger effect on individuals with a self-determined motivational orientation, who typically operated base on personal values and goals. This is reflected in column C of Table 1.

Table 1

Visual Representations of the Main Hypotheses

	A	*B*	*C*
	Associations between general styles	Situational increase of private self-awareness	Situational increase of public self-awareness
Self-Determined Motivation	Private Self-Consciousness	Minor Effect on Behaviour	Strong Effect on Behaviour
Nonself-Determined Motivation	Public Self-Consciousness	Strong Effect on Behaviour	Minor Effect on Behaviour

The fundamental differences between organismic integration and self-monitoring are central in examining the propositions made by Caver and Scheier (2000) regarding the interplay between integration and feedback loops. They reveal that self-determination theory and control theory make different predictions about the effects of being *chronically* focused on public and private aspects of the self. More specifically, this thesis suggests that public self-consciousness, as a general style, may be associated with nonself-determined motivation and with ineffective aspects of self-regulation (e.g., the pursuit of extrinsic goals or the pursuit of goals that are incoherent with the self). By contrast, private self-consciousness, as a general style, may be associated with self-determined motivation and effective aspects of self-regulation (e.g., the pursuit of intrinsic goals or the pursuit of goals that are coherent with the self).

Moreover, self-determination theory and control theory make different predictions about the effects of a *situational manipulation* of public and private self-awareness, depending on the extent to which one has a self-determined or nonself-determined motivational orientation. As Table 1 suggests, an increase in self-awareness may have a differential influence for individuals with a self-determined compared to a nonself-determined motivation. In contrast to the hypothesized negative association between public self-consciousness and self-determined motivation as general styles, this thesis suggests that a situational increase of public self-awareness may *temporarily* and *positively* influence the regulation of individuals with a self-determined motivational orientation by leading them to conform to social norms or external standards. It is important to emphasize that a state of public self-awareness should activate the same type of goals (i.e., extrinsic goals) and the same style of regulation (i.e., comply with social norms, motivation to conform), regardless

of individuals' motivational orientation, as the presence of an evaluative audience is commensurate to a controlling condition. However, this effect should be weaker for individuals with a nonself-determined motivation and stronger for individuals with a self-determined motivation, as the former already focus on social norms and external standards when they regulate their behaviours, as opposed to the latter.

Finally, this thesis suggests that a state of private self-awareness should have a different effect on individuals depending on their self-determined or nonself-determined motivational orientation. As suggested earlier, and in agreement with recent developments on the role of conscious thought in the regulation of behaviour (Baumeister & Masicampo, 2010), private self-awareness should lead individuals to focus not only on their personal attitudes and goals, but also on their personal motivational style of self-regulation as well. Much like a mirror could bring some people to focus on personal values and other people to focus on self-presentation and image (Hofmann & Heinrichs, 2002; Scheier & Carver, 1977; Wiekens & Stapel, 2008), it is hypothesized that a state of private self-awareness should lead to different effects depending on one's motivational orientation. A situational increase of private self-awareness, that brings focus to one's nonself-determined motivation, should increase the saliency of one's extrinsic goals for the self and encourage one's tendency to conform to social norms and pressures, thus significantly improving self-regulatory activity. By contrast, a situational increase in private self-awareness that brings focus to one's self-determined motivation should not have as strong an impact on self-regulatory activity. When motivation is self-determined, values and intrinsic goals are already integrated with the self, and as such making them more salient should not change individuals' style of regulation.

In sum, this dissertation suggests that one's motivational orientation and the focus of one's self-monitoring can be related in many ways, both as general styles and in specific situations. Further exploration of these intersections is thus warranted.

The Proposed Program of Research

Goals of the Thesis

The over-arching goal of this dissertation is to examine how the mechanistic self-monitoring system, proposed by control theory, and the organismic integration mechanism, proposed by self-determination theory, are inter-connected in the prediction of effective self-regulation. It is expected that "high levels" of self-determination (i.e., a more self-determined motivational orientation) and private aspects of the self should be related to one another, as both connect to internalized aspects of the self. Conversely, it is also expected that "low levels" of self-determination (i.e., a more nonself-determined motivational orientation) and public aspects of the self should be related to one another as both connect to external aspects of the self. These general propositions, along with more specific study-based hypotheses, are tested by investigating self-regulation in a particular setting, namely in the context of dieting and weight management.

Dieting and Weight Management

Dieting and weight management goal-directed behaviours provide a good setting to test the hypotheses of the current thesis for several reasons. First, research has shown that among surveyed Canadians who thought that they should somehow improve their health, 76.3% said that the most important thing to improve was related to their weight (e.g., change eating habits, exercise more, lose weight), suggesting that intentions to control body weight and the formulation of weight goals are somewhat widespread (Statistics Canada, 2005).

Second, the context of dieting and weight management allows for a clear operationalization of self-regulation and its correlates throughout the various studies. For instance, it is relatively easy to identify an intrinsic (e.g., to be healthy) versus an extrinsic (e.g., to look good) formulation of goals in relation to dieting and weight. Furthermore, behaviours relating to these goals are readily measurable (e.g., food intake), which is not always the case with self-regulatory behaviours. Finally, there is theoretical and empirical evidence to help formulate hypotheses with regard to self-monitoring and self-determination in the context of dieting and weight management.

More specifically, research on self-determination theory has suggested that global self-determination, as well as more contextual self-determination toward eating, were related to more effective self-regulation of eating behaviours and a lower prevalence of bulimic symptoms (Pelletier & Dion, 2007; Pelletier, Dion, & Levesque, 2004). With regard to self-monitoring, research has suggested that a disposition towards the public self increases the salience of pressures to conform to societal ideals of thinness and attractiveness (Drotts, 1997; Schutz et al., 2002), which in turn can lead to dysfunctional eating regulation (Polivy & Herman, 2004). Overall, both motivation and self-monitoring have been studied to some extent in the context of dieting and weight management, and research shows that both are related to self-regulation and its correlates. It is thus justified to proceed with the proposed sequence of studies for the current thesis in this interesting setting.

Sequence of Studies

To test these ideas, a sequence of four studies is proposed to answer a progression of research questions. The first study asks the very basic question: "Is there a relationship between the private and public aspects of the self and self-determination at the dispositional

level?" To this end, a meta-analysis is carried out to quantitatively examine the association between self-consciousness and global self-determination. As there is no published empirical evidence to support this hypothesized relationships, the meta-analysis is conducted on several samples of data gathered over the last five years.

Following Study 1, the next step is to investigate how self-consciousness and global self-determination function together in relation to more specific aspects of behavioural regulation. To this end, a second study aims to replicate previous findings and extend them to the context of dieting and weight management goals. Using a cross-sectional design and structural equation modeling, Study 2 proposes to test a combined model of global self-determination and self-consciousness in relation to correlates of self-regulation, namely the extent to which participants have intentions to control their body weight, as well as their intrinsic versus extrinsic weight goals orientation.

While providing valuable insight at the dispositional level, the first two studies do not test the interaction of global self-determination with more situational instances of self-monitoring. Study 3 proposes a direct experimental test of the differing predictions from CT and SDT using observable self-regulatory behaviour (rather than self-reported correlates) as an outcome. As a first step, Study 3 proposes to examine the interaction between global self-determination and private self-awareness more specifically. It is important to study this special case at the outset because it will provide interesting insight on how focusing on the private side of the self may differentially affect individuals based on their motivational orientation. Although a state of private self-awareness constitutes a similar monitoring process regardless of individuals' motivational orientation, this process should activate different content and different styles of regulation for them. While it has been argued that a

situational increase in private self-awareness should foster coherence with personal attitudes and lead to increased success at self-regulation by motivating individuals to reduce the discrepancy between an actual state and a goal (Scheier & Carver, 1983), individuals with a self-determined versus nonself-determined motivation should rely on different regulation styles in this process. Consequently, Study 3 tests whether an increase in private self-awareness for individuals with high levels of global self-determination may have a weaker impact when compared to those with low levels of global self-determination. More specifically, when in a state of private self-awareness, the self-regulation of individuals high on global self-determination should not differ compared to a control group, as these individuals should be chronically focused on their personal goals and values to regulate their behaviours regardless of the experimental condition. In contrast, because individuals low in global self-determination may not pay attention to their external goals unless they are made salient, an increase of private self-awareness should have a beneficial effect for self-regulation compared to a control condition. Study 3 explores this interaction in detail and investigates how global self-determination could moderate the relationship between private self-awareness and effective self-regulation of eating behaviours for restrained eaters confronted to tempting unhealthy food.

Finally, a fourth study aims to explore the interaction between global self-determination and public self-awareness, while also replicating the findings of Study 3. As hypothesized earlier in Table 1, it is proposed that a situational increase in public self-awareness could also be beneficial for self-regulation as it fosters self-monitoring. However, the effect of situational public self-awareness should differ for individuals with a self-determined motivational orientation compared to those with a nonself-determined

motivational orientation. As hypothesized for Study 3 with regard to private self-awareness, it is hypothesized that increasing one's level of attention on how others perceive one's actions could lead to increased success in situations with self-regulatory demands because it increases one's self-monitoring (Scheier & Carver, 1983, Carver & Scheier, 1998). This increase, however, may not have a significant impact on individuals with low levels of global self-determination as their regulation style already functions by operating through external standards. Conversely, it may have a stronger influence on individuals with high global self-determination. Study 4 thus explores this interaction in detail and investigates how global self-determination could moderate the relationship between public self-awareness and effective self-regulation of eating behaviours for individuals with intentions to control their body weight who are confronted to tempting unhealthy food.

Overall, at a conceptual level, it is expected that the integration of the organismic perspective and the perspective proposed by control theory will contribute to research on the processes involved in self-regulation At the applied level, it is hoped that this thesis will contribute to the understanding of the roles played by self-monitoring and self-determination in the context of dieting and weight management.

CHAPTER TWO:

STUDY 1

In spite of the conceptual connections between the global form of self-determination described by self-determination theory (Deci & Ryan, 1985a, 2002; Vallerand, 1997) and the private and public forms of self-consciousness described by control theory (Carver & Scheier, 1981, 1998; Scheier & Carver, 1983), no research to date has investigated the relationship between these constructs. The question thus remains: is there empirical evidence to support the idea of an association between global self-determination and the two types self-consciousness proposed by Carver and Scheier (1981, 1984)?

The present study was designed to answer that question directly. To this end, a meta-analytic review was conducted to provide quantitative estimates of this hypothesized association. Since no published research has examined the relationship between self-consciousness and global self-determination, several samples of data were gathered over a period of five years. These samples served for other research purposes but the explicit association between global self-determination and self-consciousness remained unexamined. A systematic review of these samples in the form of a meta-analytic investigation was thus carried out.

In the context of this study, the association between global self-determination and self-consciousness was hypothesized in two ways: (a) it was expected that global self-determination and private self-consciousness would be positively related; (b), it was expected that global self-determination and public self-consciousness would be negatively related.

As they are both thought to function at a more dispositional level, it is theoretically sound to postulate that self-consciousness could be associated with global self-determination more so than with domain-specific forms of self-determination (e.g. motivation for eating, for the environment, for sports). However, an exploratory investigation of the relationships between self-consciousness and these forms of self-determination could also prove interesting. As such, these associations were also explored.

Finally, in line with previous research (Scheier & Carver, 1983), it was also expected that private and public self-consciousness would be moderately associated with one another.

Method

Samples

Six independent samples collected from a period of five years served for the present analyses. To be selected, samples had to include a measure of public and private self-consciousness (Revised Self-Consciousness Scale, SCS; Scheier & Carver, 1985) and at least one measure of self-determination. Although the focus of this investigation was on global self-determination (Global Motivation Scale, GMS; Pelletier, Blanchard, Sharp, Otis, & Amiot, 2008), other measures of self-determination were also considered for exploratory purposes, namely : eating (Regulation of Eating Behaviors Scale, REBS; Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004), environment (Motivation Toward the Environment Scale, MTES; Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998) and sports (Sport Motivation Scale, SMS, Pelletier, Fortier, Vallerand, Tuson, Brière, & Blais, 1995). Pearson's zero-order correlation coefficients between the SCS and the various self-determination measures were first computed within each sample and then used in the meta-analytic review.

Table 2 provides descriptive statistics for each sample. Sample sizes ranged from 42 to 2025, totalizing to 3308 participants. Samples 1 through 5 were comprised of psychology undergraduate students, while sample 6 was comprised of elite athletes. As there are more females than males registered in undergraduate psychology course, females represent the majority of participants in samples 1 to 5 (64% to 78%). The mean age for participant was similar across all the samples (19.80-23.51).

Table 2

Study 1: Descriptive Statistics for Samples Included in the Meta-Analysis

Sample	N	% female	Mean age (SD)	Age range	Scales
1	297	78	20.97 (3.79)	17 - 55	SCS, GMS, REBS, MTES
2	2025	72	19.49 (4.33)	16 - 83	SCS, GMS, MTES, SMS
3	164	68	22.29 (5.98)	17 - 49	SCS, GMS, REBS, MTES
4	641	71	19.80 (3.68)	16 - 46	SCS, GMS, REBS, MTES
5	139	64	23.51 (7.49)	17 - 58	SCS, GMS, REBS, MTES
6	42	50	20.61 (3.79)	16 - 29	SCS, SMS

Note. SD = standard deviation, SCS = self-consciousness scale, GMS = global motivation scale, REBS = regulation of eating behaviors scale, MTES = motivation towards the environment scale, SMS = sport motivation scale

Measures

Revised Self-Consciousness Scale (SCS). Following the development of the original self-consciousness scale (Fenigstein, Scheier, & Buss, 1975), Scheier & Carver (1985) proposed a revised scale better suited for use with general populations. The SCS-R (simplified to "SCS" in the current manuscript) has since been used in numerous studies to measure the effects of private and public aspects of the self. The private self-consciousness subscale is comprised of 9 items (e.g. "I think about myself a lot") and the public self-consciousness subscale is comprised of 7 items (e.g. "I care a lot about how I present myself to others"). Participants' responses are rated on a 4-point Likert scale, ranging from 1 (not at all like me) to 4 (exactly like me). In their validation study, Scheier and Carver (1985) reported good internal consistency estimates (.75 for private self-consciousness and .84 for public self-consciousness) and good test-retest reliability (r = .76 for private self-consciousness and r = .74 for public self-consciousness). Both subscales are typically analysed separately by computing a global score for private self-consciousness and one for public self-consciousness.

Global Motivation Scale (GMS). This scale assesses general reasons for which people engage in the activities of their daily lives. It is comprised of 18 items in six subscales, representing the six regulation forms on the self-determination continuum (intrinsic, integrated, identified, introjected, external and amotivation). Items describe different reasons for doing things in general: intrinsic motivation (e.g. "in order to feel pleasant emotions"), integrated regulation (e.g. "because they reflect what I value most in life"), identified regulation (e.g. "in order to help me become the person I aim to be"), introjected regulation (e.g. "because I would beat myself up for not doing them"), external regulation (e.g. "in

order to show others what I am capable of"), and amotivation (e.g. "although I do not see the benefit in what I am doing"). Participants rate the items on a 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Internal consistency estimates for the subscales have ranged from .77 to .92 in previous research (Pelletier & Dion, 2007). Sharp, Pelletier, Blanchard, & Levesque (2003) also demonstrated support for the reliability and validity of the GMS in five independent studies, further suggesting that the scale has good psychometric properties.

To measure participants' general levels of self-determination in a parsimonious model, a number of studies have shown the usefulness of combining the scores of each subscale into either a self-determination index (Blais, Sabourin, Boucher, & Vallerand, 1990; Pelletier & Dion, 2007; Ryan & Connell, 1989; Vallerand, 1997). Following the steps outlined in past literature, scores from each subscale were weighted based on their position in the self-determination continuum (intrinsic motivation +3; integrated regulation +2; identified regulation +1; introjected regulation -1; external regulation -2; amotivation -3). Accordingly, "high global self-determination" refers to a more self-determined motivational orientation as a general style, while "low global self-determination" refers to a more nonself-determined motivational orientation as a general style.

Regulation of Eating Behaviors Scale (REBS). Similar to the GMS but applied to the regulation of eating behaviours, this scale is comprised of 24 items divided into six subscales based on the self-determination continuum. The scale proposes different reasons for the regulation of eating behaviours. It has been shown to have good internal consistency (.77 to .90) and good construct validity, in addition to supporting the simplex pattern posited by the

self-determination continuum (Pelletier et al., 2004). An overall index of eating self-determination can be computed by applying the formula described above for the GMS.

Motivation Toward the Environment Scale (MTES). This scale is also constructed along the same lines as the GMS, and is applied to the regulation of pro-environmental behaviours. It is comprised of 24 items divided into six subscales based on the self-determination continuum. The scale provides participants with various reasons for doing things for the environment. It has been shown to have good internal consistency (.78 to .96), good construct validity, and good test-retest reliability (r = .71), in addition to supporting the self-determination continuum (Pelletier et al., 1998). An overall index of pro-environmental self-determination can be computed by applying the formula described above for the GMS.

Sport Motivation Scale (SMS). Finally, the sport motivation scale reflects various reasons for which participants may engage in sport activities. It is constructed in a similar fashion to the GMS and the other scales mentioned above. It is also comprised of 24 items divided into six subscales based on the self-determination continuum. Pelletier and colleagues (1995) originally developed the scale and demonstrated its psychometric properties across various studies (test-retest: r = .70; internal consistency coefficients .69 - .85). An overall index of sport self-determination can be computed by applying the formula described above for the GMS.

Meta-Analytic Procedure

A series of meta-analyses was conducted on the data to examine the relationship between self-consciousness and self-determination based on different pairings. The main analyses examined the relationship between self-consciousness and global self-determination across samples. Subsequently, three other meta-analytic combinations were explored using

self-determination for eating, toward the environment, and for sports, in association with self-consciousness. For each set of analyses, a weighted average correlation was estimated for the association between private self-consciousness and self-determination (GMS, REBS, MTES, or SMS), and for the association between public self-consciousness and self-determination (GMS, REBS, MTES, or SMS). Finally, the association between public and private self-consciousness was also examined across samples. As such, nine sets of analyses were carried out in total.

Moderators. Samples were coded with two additional moderating variables that were used in the main analyses. First, the unequal balance of gender representation in the majority of samples warranted a test of gender effects. Consequently, the percentage of female participants was included in the main analyses to examine whether a variation of the percentage had an effect on the estimated association between private self-consciousness and global self-determination. This moderation was tested using a fixed effect meta-regression where the dependent variable is the estimated weighted average correlation and the predictor is the percentage of female participants. The same analysis was run for the association between public self-consciousness and global self-determination. Second, although the age group was similar across samples, the sample mean age was also used as a moderator variable in a fixed effect meta-regression for the two estimated weighted average correlation computed in the main analyses.

Computation of effect sizes. The main goal of a meta-analysis is to obtain an overall weighted, rather than averaged, effect size and confidence interval from a group of individual independent effect sizes. The software Comprehensive Meta-Analysis (CMA; Borenstein, Hedges, Higgins, & Rothstein, 2005) was used to carry out these analyses.

Although a correlation is considered a measure of effect size, experts recommend that correlations should be transformed into Fisher's Z scores for the computation of an overall weighted effect size, which is in turn converted back into an overall weighted correlation for interpretation purposes (Borenstein, Hedges, Higgins, & Rothstein, 2009). CMA was used to compute a Fisher's Z score for each pairing of interest in the current series of meta-analyses. Sample size was used to compute the standard error of each point estimate. The Fisher's Z scores were then weighted according to the inverse variance of their associated sample and combined to yield an estimated weighted average correlation for each set of analyses (nine in total).

These procedures were carried out independently for all sets of analyses and each sample counted for a single unit within a set (to respect independence of observations). Each analysis provided four statistics: a point estimate of the overall weighted effect size, a confidence interval (95%) for that effect size, a z-score, and a Q-value. The Q statistic is used to estimate the level of heterogeneity stemming from a group that was used to compute a particular overall effect size. Q-values can be interpreted as significance tests of heterogeneous groups of effect sizes (Rosenthal, 1995).

Meta-analytical statistics can be obtained by assuming either an underlying fixed-effect model or a random-effects model. In a fixed-effect model, it is assumed that the true effect size is the same across all samples. In the present context, the fixed-effect model would estimate that the various correlations used to compute the overall weighted correlation are sampled from a single true correlation that does not change across samples and all variations are caused by chance. Alternatively, a random-effects model assumes that the true effect size is sampled from a distribution of true effects, thus allowing some variability. In

the present context, the random-effects model would estimate that the various correlations used to compute the overall weighted correlation are sampled from a distribution of true correlations. The Q statistic is only valid in a fixed-effect model, as the random-effects model does not consider heterogeneity as an issue. However, recent research has suggested that random-effects models may be less biased and has recommended the use of random-effects models over fixed-effects models in meta-analysis (Hunter & Schmidt, 2000). Consequently, both models were used to estimate meta-analytical statistics in the current study. On one hand, the random-effects model was used in order to minimize bias, but on the other hand, a fixed-effects model was used to obtain measures of heterogeneity.

Results

Main Analyses: Global Self-Determination and Self-Consciousness

The main analysis was carried out in three steps. The samples that provided a Pearson's zero-order correlation coefficient for the relationship between private self-consciousness and global self-determination were meta-analytically examined in a first step, followed by similar analyses for the public self-consciousness and global self-determination pairing, and finally for the private/public self-consciousness pairing. All correlations used in the main analyses were corrected for scale unreliability. A meta-analytically derived correlation matrix was created with the results and is presented in Table 3. Findings from the random-effects model and the fixed-effect model were very similar. As they are less biased (Hunter & Schmidt, 2000), the weighted average correlations that are reported here were obtained through the random-effects model. The Q values, however, were obtained through a fixed-effect model. They are provided for informative purposes.

Table 3

Study 1: Meta-Analytically Derived Correlation Matrix

	1	2	3
(1) Global Self-Determination	-	.18** (.15 – .21) k = 5 $Q_{(4)} = 6.42$	-.21** (-.24 – -.17) k = 5 $Q_{(4)} = 0.46$
(2) Private Self-Consciousness		-	.60** (.58 – .62) k = 6 $Q_{(5)} = 60.01$*
(3) Public Self-Consciousness			-

Note. ** $p < .01$. 95% confidence intervals reported in parentheses. Average weighted correlations and confidence intervals computed using a random-effects model. Q statistic computed using a fixed-effect model. Correlations have been corrected for scale unreliability.

Private self-consciousness and global self-determination. The range of observed corrected correlations varied from .10 to .26 across samples. Using a random-effects model, an estimated weighted average correlation suggested a small positive relationship between global self-determination and private self-consciousness (r = .18). This relationship reached overall statistical significance (z = 10.23, p <.01) and is expected to vary between .15 ≤ r ≤ .21 according to a 95% confidence interval. The overall composite effect size was homogeneous (Q = 6.42, p >.05).

Public self-consciousness and global self-determination. The range of observed corrected correlations varied from -.21 to -.16 across samples. An estimated weighted average correlation, also obtained through a random-effects model, suggested a small negative relationship between global self-determination and public self-consciousness (r = -.21). This relationship reached overall statistical significance (z = -11.92, p <.01) and is expected to vary between -.24 ≤ r ≤ -.17 according to a 95% confidence interval. The overall composite effect size was homogeneous (Q = 0.46, p > .05).

Private and public self-consciousness. The range of observed correlations varied from .24 to .53 across samples. Always using a random-effects model, an estimated weighted average correlation suggested a moderate positive relationship between private and public self-consciousness (r = .60). This relationship reached overall statistical significance (z = 39.87, p <.01) and is expected to vary between .58 ≤ r ≤ .62 according to a 95% confidence interval. The overall composite effect size was found to contain some level of heterogeneity (Q =60.01, p <.001). The presence of heterogeneity in the weighted average correlation indicated underlying variability in studies' computed effect sizes.

Moderation of Main Effects

Four separate fixed-effect regressions were carried out to test various moderating effects on the estimated weighted average correlations. The percentage of female participants was tested as a moderator of the relationship between private self-consciousness and global self-determination, as well as of the relationship between public self-consciousness and global self-determination. Furthermore, average sample age was also tested as a moderator of the relationship between private self-consciousness and global self-determination, as well as of the relationship between public self-consciousness and global self-determination. [1]

Percentage of female participants. The estimated weighted average correlation between private self-consciousness and global self-determination was regressed on the percentage of female participants per sample, yielding a statistically non-significant slope (z = -0.727, p = .467). The point estimate of -.47 (95% CI: -1.72 – .79) thus could not be considered different from 0. In a similar way, the estimated weighted average correlation between public self-consciousness and global self-determination was regressed on the percentage of female participants per sample, again yielding a statistically non-significant slope (z = -0.428, p = .669). The point estimate of -.27 (95% CI: -1.53 – .98) thus could not be considered different from 0.

Average sample age. Similar regression analyses were carried out using average sample age as a predictor in the regressions. The relationship between private self-consciousness and global self-determination was not affected by this moderator (z = 0.191, p = .848), yielding a point estimate for the slope of .00 (95% CI: -.03 – .04). Results were along the same line for the relationship between public self-consciousness and global self-

[1] Although not of direct interest to the present study, another set of fixed-effect regressions was carried out to examine whether the relationship between private and public self-consciousness could be moderated by percentage of female participants and average sample age. No statistically significant moderation was found.

determination ($z = 0.522$, $p = .602$), yielding a point estimate for the slope of .01 (95% CI: -.02 – .04).

Exploratory Analyses

Six other meta-analytical parings were examined from an exploratory point of view. The purpose of these analyses was to investigate whether the hypothesized relationships between self-consciousness and global self-determination would also hold for more domain-specific forms (Vallerand, 1997) of motivation. As can be seen from the findings reported in Table 4, private and public self-consciousness were not consistently associated with the more domain-specific forms of self-determined motivation, but the statistically significant associations follow the same trend suggested by the main analyses. More precisely, private self-consciousness appeared to be positively associated with the domain-specific self-determined motivations toward eating and the environment, while public self-consciousness appeared to be negatively associated with the domain-specific self-determined motivation toward sports. Not surprisingly, the Q-value for the relationship between private self-consciousness and sport self-determination (based on $k = 2$ very different correlations) suggested some level of heterogeneity in the estimated weighted average correlation. All other Q-values were not statistically significant.

Table 4

Study 1: Effect Size Estimates between Self-Consciousness and Other Motivational Constructs

	k	*r* (95% CI)	Q	Observed range of *r*
Private Self-Consciousness				
SD for Eating	4	.09** (.03 – .16)	3.74	-.02 – .14
SD for Environment	5	.11** (.07 – .14)	2.38	.06 – .21
SD for Sports	2	.11 (-.26 – 45)	5.73*	-.05 – .33
Public Self-Consciousness				
SD for Eating	4	-.03 (-.09 – .03)	3.06	-.09 – .02
SD for Environment	5	-.02 (-.05 – .02)	2.33	-.08 – .03
SD for Sports	2	-.15** (-.19 – -.10)	0.18	-.15 – -.08

Note. * $p < .05$, ** $p < .01$. CI = confidence intervals. Average weighted correlation and confidence intervals computed using a random-effects model. *Q* statistic computed using a fixed-effect model.

File Drawer Analysis

The "file drawer analysis" (Rosenthal, 1979; 1995) was developed in order to investigate the sampling bias inherently present in meta-analyses. It is less pertinent in the current context as the series of meta-analyses are based on a small number of samples provided solely by the author and colleagues, as no previous research has examined these relationships. Nevertheless, a file drawer analysis was carried out as meta-analyses traditionally report this statistic and it does provide a limited but interesting amount of information in this study.

Because an unknown number of unpublished and non-significant data could possibly exist (hence the name "file drawer" analysis) and significantly influence the overall effect size, it is important to take into consideration a *fail-safe N*. This hypothetical sample size represents the number of additional null results studies that would need to be included to reduce the overall level of significance ($p = .05$ or higher) of the estimated weighted average correlations reported in this study. For the relationship between private self-consciousness and global self-determination, computations reveal that additional 65 null-results studies would need to exist in researchers' file drawers to void its statistical significance. In the case of the public self-consciousness and global self-determination relationship, there would need to exist an additional 90 null-results studies. Finally, to void the statistical significance of the private/public self-consciousness association reported in the current study, an additional 758 null results findings would need to exist in file drawers.

Discussion

The main goal of Study 1 was to investigate the relationships between global self-determination and the two forms of self-consciousness: private and public. By using a meta-

analytic technique, this investigation was designed to provide an overall effect size for the relationships between (a) global self-determination and private self-consciousness, and (b) global self-determination and public self-consciousness.

Overall, the findings reported here provide the first evidence of empirical support for the relationship between these constructs. More specifically, results from the series of meta-analyses carried out on five independent samples suggest that global self-determination is positively associated with private self-consciousness and negatively associated with public self-consciousness. These associations do not appear to be moderated by gender or age and seem to hold for more domain-specific motivations, although not consistently. While the meta-analytically derived correlation matrix revealed statistically significant associations, it should be noted that the effect sizes of the relationships between the two forms of self-consciousness and global self-determination were relatively small. Nonetheless, these associations were shown to be consistent across five independent samples[2].

As such, the findings from the current study provide preliminary support this thesis's contention that more self-determined or autonomous forms of motivation at the dispositional level (as measured by greater global self-determination) are associated with more private and personal forms of self-monitoring (as measured by private self-consciousness). In a similar vein, the negative overall correlation between global self-determination and public self-consciousness can be interpreted in the sense that that more controlled or nonself-determined forms of motivation at the dispositional level (as measured by lower global self-

[2] It could be argued that the samples presented here might not be equivalent as (a) one sample is comprised of a significantly larger number of participants the others and (b) one sample is comprised of a different population than the others. However, the reported meta-analyses were carried out with and without these samples respectively, and yielded very similar effect sizes for the relationships between the two forms of self-consciousness and global self-determination regardless of their inclusion/exclusion.

determination) are associated with more public and external forms of self-monitoring (as measured by public self-consciousness).

The results of this meta-analytic review also suggested that the connection between self-consciousness and self-determination was also present with more domain-specific forms of motivation. These tests were exploratory and serve to support the idea that more self-determined forms of motivation may be generally conceptualized to operate in conjunction with private forms of self-monitoring while nonself-determined forms of motivation may be generally conceptualized to operate in conjunction with public forms of self-monitoring. One reason why these associations were not consistently found throughout the three explored domains may be that the connection between self-consciousness and self-determination operates essentially at the global level. As global self-determination and its domain-specific forms are thought to be fairly related (Vallerand, 1997), the associations found at the domain-specific level could simply be an artefact of this confound. Although it is not the goal of this thesis to investigate this particular relationship, more research between self-consciousness and domain-specific forms of motivation is warranted.

The findings of Study 1 also support previous research that suggested that both forms of self-consciousness are more or less related to one another (Scheier & Carver, 1983). The magnitude of their association in this meta-analysis corresponded with the findings of the original validation study, $r = .38$ (Scheier & Carver, 1985). Although both forms of self-consciousness were differentially associated with global self-determination, they were also positively correlated with each other. This finding underlines that both private and public forms have common roots in the extent to which one self-monitors, while diverging in how that self-monitoring operates (as suggested by the differential correlations with global self-

determination). The overall effect size computed for the association between private and public self-consciousness presented some level of heterogeneity. A number of explanations for this heterogeneity can be readily ruled out, namely measurement issues as all samples used the same questionnaire, and design issues, as all samples used a cross-sectional design. Upon closer inspection of the individual correlations for each sample, it appears that particularly low correlation (r = .27) was provided by the sample of elite athletes. The heterogeneity may thus be sample based and the correlation between private and public forms of self-consciousness may be different for a population of elite athletes compared to undergraduate psychology students. It is noteworthy that this issue is inherent to a fixed-effect model and is not pertinent in a random-effects model.

While making an important contribution, this study only provided preliminary evidence of the association between global self-determination and self-consciousness. Accordingly, further research is needed to investigate *how* the interaction between these constructs operates in relationship to more specific psychological outcomes, such as and behavioural intentions and goal orientation. Study 2 was designed to examine these ideas in the context of dieting and weight management goals.

CHAPTER THREE:

STUDY 2

Study 1 suggested that more self-determined forms of motivation may be positively associated with private forms of self-monitoring while less self-determined forms of motivation may be positively associated with public forms of self-monitoring. However, there is still little knowledge on how these variables function together in relation to more specific aspects of behavioural regulation, such as intentions and goals. This study attempted to replicate the findings of Study 1 and extend them to the context of dieting and weight management goals. More precisely, it proposes to test a combined model of global self-determination and self-consciousness in relation with (a) intentions to control body weight and (b) weight goals orientation. Because of obvious conceptual connections, the tests were executed while taking into account eating self-determination.

With regard to the prediction of intentions to control body weight, the literature on SDT has suggested that higher levels of self-determination are usually associated with an increase in behavioural intentions (Deci & Ryan, 2002). As a more conceptually proximal source of influence, it is thus expected that eating self-determination will be associated with increased intentions to control body weight. Moreover, there is no theoretical reason to expect a direct relationship between self-determination at a global level and the more specific intentions to control body weight, but an indirect effect may be hypothesized through eating self-determination, as both forms of self-determination should be somewhat associated (Pelletier & Dion, 2007; Vallerand, 1997). By contrast, a direct association between both forms of self-consciousness and intentions can be expected. On one hand, as publicly self-conscious individuals are more concerned with self-presentation and image

(Scheier & Carver, 1983), they may be more likely to have higher intentions to control body weight. On the other hand, as privately self-conscious individuals are more centered on personal feelings and values, they may be more likely to have fewer intentions to control body weight.

The current literature on intrinsic versus extrinsic goal content can also help formulate hypotheses for the proposed model. As goal content is closely related to the motivation that underlies the pursuit of that goal (Kasser & Ryan, 1996; Sheldon et al., 2004), it is expected that both global self-determination and eating self-determination will be associated with a more intrinsic orientation of weight goals. Additionally, there are apparent conceptual connections between the focus of self-monitoring (private versus public) and the orientation of goal content (intrinsic versus extrinsic). On one hand, it is expected that private self-consciousness, because of its focus on aspects such as personal values, will be associated with a more intrinsic orientation of weight goals, such as personal health. On the other hand, it is hypothesized that public self-consciousness, because of its focus on aspects such as image, will be associated with a more extrinsic orientation of weight goals, such as being physically attractive. Finally, as both are somewhat externally focused, it is expected that as intentions aimed specifically toward dieting increase, so does extrinsic goal content.

Study 2 proposes to test a conceptual model (Figure 1) with the following hypotheses:

H1: Intentions to control body weight will be predicted positively by eating self-determination and by public self-consciousness, but negatively by private self-consciousness

H2: A more intrinsic versus extrinsic orientation of weight goals will be predicted positively by global self-determination, eating self-determination, and private self-

consciousness, but negatively by public self-consciousness and intentions to control body weight.

H3: Eating self-determination will be predicted by global self-determination.

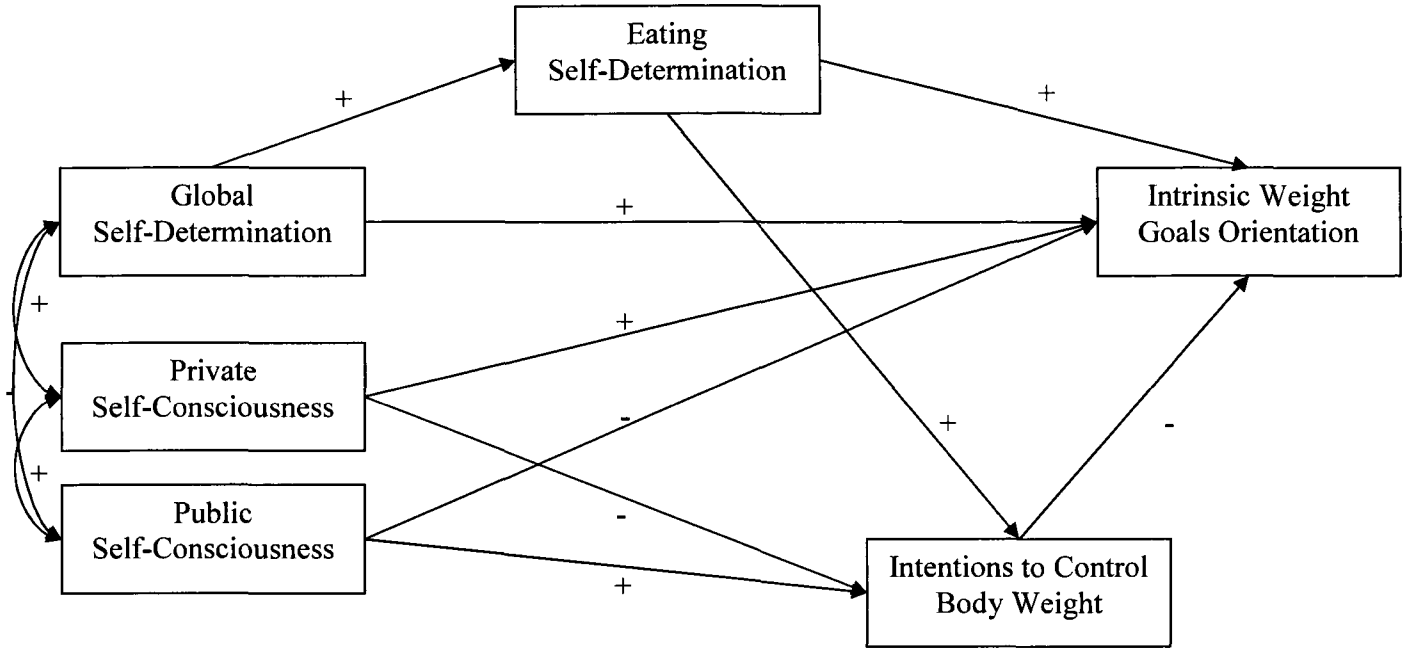

Figure 1. Study 2: Hypothesized model

Method

Participants and Procedure

Undergraduate students (N = 553; 375 females and 178 males) enrolled in introductory psychology courses at the University of Ottawa completed a questionnaire for the purpose of this study[3]. The mean age of participants was 19.5 years with a standard deviation of 3.1, and the age ranged from 17 to 54 years. Participants who took part in this study received partial credit, were informed of the voluntary nature of their participation, and assured that their responses would remain confidential. All data were collected through an online testing system as part of the introductory psychology curriculum.

Measures

Revised Self-Consciousness Scale (SCS). This is the same instrument which was used previously. Please refer to its description in Study 1. In the context of the present study, the internal consistency of the private and public subscales was established. Cronbach's alpha was .73 for private self-consciousness and .80 for public self-consciousness.

Global Motivation Scale (GMS). This is the same instrument which was used previously. Please refer to its description in Study 1. To estimate internal consistency in the present sample, a Cronbach's alpha coefficient was computed for the combined motivation subscales in the global self-determination index, i.e. for all the items together, and was found to be of acceptable magnitude: .79.

Regulation of Eating Behaviors Scale (REBS). This is the same instrument which was used previously. Please refer to its description in Study 1. Internal consistency of the scale in

[3] It should be noted that for the purposes of independence and valid replication, the sample collected for this study did not serve in the meta-analysis presented in Study 1.

the context of the present study was acceptable, as suggested by the computed Cronbach's alpha of .86 for the combined items.

Intentions to Control Body Weight. Participants' intentions to control their body weight were assessed with a single item: "How important is it for you to control your body weight?" Participants rated this item on a scale of 1 "Not important at all" to 7 "Extremely important"

Weight Goals Orientation. In order to establish the intrinsic versus extrinsic orientation of participants' weight goals, Kasser and Ryan's (1996) Aspirations Index was adapted to measure more specific goals pertaining to trying to lose weight or maintaining one's weight. In total, 14 items measured different intrinsic (e.g., "be healthy", "feel good") and extrinsic (e.g., "be beautiful", "hide signs of aging") goals, each rated on a scale from 0 ("does not apply to me") to 7 ("extremely true"). Based on previous research (Kasser & Ryan, 2001; Kasser & Sheldon, 2000), a global score of relative intrinsic weight goal orientation was computed by subtracting the sum of extrinsic items from the sum of intrinsic items. As a result, the weight goals orientation variable can be interpreted in the sense that higher scores reflect a higher prevalence of intrinsic rather than extrinsic goals for participants, while low scores reflect a higher prevalence of extrinsic rather than intrinsic goals. The Cronbach's alpha for this adapted scale was .91 with the current sample.

Path Analyses

The analytic strategy selected to investigate the hypotheses of the present study relied on path analyses conducted via structural equation modeling (SEM) with the LISREL 8.80 computer software (Jöreskog & Sörbom, 2006). The default and most common estimation procedure was use to derivate parameter estimates: maximum likelihood estimation (ML).

ML is a full-information method that computes estimates for all parameters simultaneously and is based on normal theory; it is also scale invariant, meaning that it is not affected by the scaling of the observed variables (Kline, 2005). As the input of a correlation matrix can lead to biases in estimation procedures and model fit, Kline (2005) recommends that structural equation modeling analyses be derived from a dataset's covariance matrix instead. In the present study, while both the correlation matrix and covariance matrix will be reported, only the latter was used for SEM.

Selected Model Fit Indices

Model fit provides a quantitative estimate of the extent to which a given model is able to reproduce the sampled data (in this case, the covariance matrix). While a model's fit is not tributary to its conceptual validity, it offers a standardized approach to model comparison. Evaluation of model fit with LISREL 8.80 yields over a dozen indices of model fit, and even more are available through the use of other software. For the purpose of the present study, four of the most commonly accepted indices of fit have been selected.

Chi-square. The chi-square works as a significance test for the difference between the observed covariance matrix and the model-implied (predicted) covariance matrix. As with most statistical tests, the null hypothesis presumes that there is no difference between both matrices. Accordingly, a "good" model is one where the null hypothesis is not rejected ($p > .05$). A common issue with the chi-square is its sensitivity to sample size and correlation magnitude. With larger sample sizes the significance test of the chi-square becomes irrelevant as it is almost systematically significant. In addition, as the correlations (or standardized covariances) between model variables increase in magnitude, so does the chi-square value, thus suggesting poorer fit. A solution to these issues has been to use a chi-

square to degrees of freedom ratio, but there are no consistent standards for its evaluation. As a consequence, the chi-square is still traditionally reported as an index of model fit, but it should always be supported by the use of more stringent and standard fit indices.

Comparative Fit Index (CFI). Originally developed by Bentler (1990), the CFI works as a comparative function to a baseline model (a null model where all covariations are set to 0). The expected values of the CFI vary from 0.00 to 1.00. Some authors suggest that a CFI > .95 is indicative of a good fit (Hu & Bentler, 1999), while others suggest that CFI > .90 is a good fit (Kline, 2005).

Root Mean Square Error of Approximation (RMSEA). This assessment of fit was originally proposed by Steiger and Lind (1980) and essentially operates as a "badness of fit" indicator, with higher values indicating worse fit. The RMSEA is thus a discrepancy function that is computed from the model residuals, although it also compensates for model complexity by taking into account the number of degrees of freedom. MacCallum, Browne and Sugawara (1996) suggest that values below .05 are acceptable, and Kline (2005) suggests that values above .10 represent poor fit.

Standardized Root Mean Square Residuals (SRMR). Another way of assessing model fit is by directly comparing the observed covariance matrix and the model-implied covariance matrix. This can be accomplished by obtaining the difference between observed and predicted values. Accordingly, a perfect fit would be reflected by a value of 0. The SRMR is the mean of all residual values in this standardized "residual covariance matrix". Various authors agree that any value below .08 is considered a good fit. Kline (2005) suggests values below .10 are acceptable.

Results

Data Preparation

An important initial step to any multivariate analysis but particularly to structural equation modeling (SEM) is data preparation. Before computing a covariance matrix for the sample, the original data set was thus screened for potential problems according to the guidelines suggested by Kline (2005) for SEM specifically and by Tabachnick and Fidell (2001) for multivariate analyses in general. These steps are detailed next.

Adequate ratio of cases to variables. Sample size in path analyses and SEM has a direct impact on statistical precision. Although a sample size of 200 cases is commonly considered a minimum, more complex models require a larger sample size. A ratio of cases to variables of 20:1 is usually deemed to be ideal (Kline, 2005). Since the hypothesized model identifies 6 variables, the minimum number of cases following this recommendation would be 120; the current sample largely surpasses this requirement.

Missing data. The presence of missing data can be problematic in any dataset, particularly if it is missing systematically. IBM SPSS 18.0 was used to conduct a missing values analysis on the current sample and revealed that no variable presented more than 7% of missing data. Furthermore, the missing data was found to be missing completely at random: Little's MCAR $\chi^2_{(2019)} = 2110.09, p = .077$. A model-based imputation method was used to generate values for the missing scores using an expectation-maximization algorithm. Consequently, the final sample used to generate the covariance matrix consisted of 553 cases with no missing data.

Multivariate normality. Multivariate normality refers to the extent to which all bivariate relationships are linear and homoscedastic, all pairwise joint distributions are

bivariate normal and all univariate distributions are normal (Kline, 2005). Before proceeding with the computation of a covariance matrix, the data were screened for evidence of bivariate nonlinearity and heteroscedasticity. A series of bivariate scatterplots between model variables were graphed and visually examined. There were no problematic relationships, with the exception of the relationship between intentions to control body weight and weight goals orientation, which was slightly heteroscedastic. However, this slight departure from normality was expected as it is normal for goal orientation to have little variance when goal intentions themselves are low, while that variability would increase as goal intentions also increase. As a consequence, no transformations were carried out on these variables.

Next, as most departures of multivariate normality can be detected through the inspection of univariate distributions (Kline, 2005; Tabachnick & Fidell, 2001), univariate normality was investigated through skewness and kurtosis values. These values can be found in Table 5. A common approach to testing skewness and kurtosis is to treat the ratio of the unstandardized value to its standard error as a z test. However, this can be problematic in large samples as significance is almost systematically reached (Kline, 2005; Tabachnick & Fidell, 2001). Kline (2005) offers some suggestions for absolute standards judged adequate for tests of normality in SEM data preparation: the ratio of skewness to its standard error should not be greater than 3.0 and the ratio for kurtosis should not be greater than 8.0. In the current data set, all variables were judged to be univariate normal with the exception of intentions to control body weight which was negatively skewed (-.891/.104 = -8.57). Accordingly, a reflected square root was used to transform the variable to a more normal distribution. However, a correlation matrix of the six model variables indicated that overall

correlations did not differ for more than $\Delta r = .031$ when the transformed variable was used compared to the original variable. For ease of interpretation, the original untransformed variable was used in the model.

Outlier cases. Another step in data preparation for SEM is the search for outlier cases, as these could bias the estimation procedures in the test of the hypothesized model. When a certain case presents an extreme score on a single variable, it is considered a univariate outlier. A multivariate outlier, by contrast, can be either a case that has extreme scores on more than a single variable or that presents a score pattern that is unusual for the sample. Outlier cases were screened in two steps. First, a test of univariate outliers was carried out by standardizing the model variables and searching for scores at an extreme distance from the mean, namely z ±3.29 (Tabachnick & Fidell, 2001). A single univariate outlier was detected on the extreme high end of the variable global self-determination. Following the guidelines outlined by Tabachnick and Fidell (2001), the score of this outlier case was transformed to one unit greater than the first non-outlier case for this variable. Second, a multivariate search for atypical outlier patterns was carried out using a method based on the Mahalanobis distance (Kline, 2005; Tabachnick & Fidell, 2001). Two instances of multivariate outlier cases were detected based on a criteria of $\chi^2_{(6)} = 22.46, p < .001$. A correlation matrix was computed with and without the cases presenting the unusual patterns and found their effect to be negligible, with no difference of more than $\Delta r = .005$. As a consequence, the multivariate outlier cases were kept for the finale analyses.

Multicollinearity. The presence of multicollinearity can cause issues in ML estimation procedures when two variables thought to be independent become almost redundant. Basically, multicollinearity occurs when the correlation between two variables is

extremely high. Tabachnick and Fidell (2001) recommend screening the correlation matrix for correlations above .90 which would be indicative of multicollinearity. Alternatively, one can compute a value of tolerance ($1 - r^2$) for each pairwise relationship in the sample. Tolerance refers to the proportion of variance that is unique to the variables; values below .10 can be indicative of multicollinearity (Kline, 2005). No multicollinearity was detected in the present data.

Table 5

Study 2: Descriptive Statistics

Variable	Mean (SD)	Skewness	Kurtosis	Observed Range
Global Self-Determination	7.64 (6.76)	.268	.110	-12.33 / 28.00
Private Self-Consciousness	24.87 (4.53)	.203	-.238	12.00 / 36.00
Public Self-Consciousness	20.21 (4.13)	-.151	-.624	9.00 / 28.00
Eating Self-Determination	15.29 (9.24)	-.220	-.333	-13.50 / 36.00
Intentions to Control Body Weight	5.20 (1.40)	-.891	.697	1 / 7
Weight Goals Orientation	7.77 (10.24)	.045	-.441	-25.00 / 35.00

Note. SD = standard deviation, standard error for skewness = .104, standard error for kurtosis = .207

Descriptive Statistics and Preliminary Analyses

Descriptive statistics (Table 5) suggested that participants in the sample were well distributed in terms of global self-determination, their scores ranging from the low negative end to the high positives. Considering that negative scores of global self-determination typically represent a higher prevalence of nonself-determined forms of motivation while positive scores are tributary to more self-determined forms of motivation, participants in the sample were somewhat globally self-determined ($M = 7.64$). Interestingly, participants were also higher on private self-consciousness than public self-consciousness ($t_{(552)} = 24.59$, $p < .001$). The high scores (> 20) on both types of self-consciousness revealed that participants were active at self-monitoring, operating on both a public and a private level. With regard to eating and weight variables, participants generally presented a relatively self-determined motivation towards eating ($M = 15.29$) as well as high intentions to control body weight ($M = 5.20$). Overall, participants reported goal orientations that were more intrinsic than extrinsic ($M = 7.77$), although that variable presented great variability ($SD = 10.24$) and range (-25 to 35).

The Pearson zero-order correlation matrix is presented in the upper diagonal of Table 6. Correlations were of the expected magnitude and direction, with the exception of the relationships between private self-consciousness and weight goals orientation as well as intentions to control body weight. The variance-covariance matrix used to test the hypothesized model is also presented in Table 6.

Table 6

Study 2: Pearson Zero-Order Correlation and Variance-Covariance Matrices

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Global Self-Determination	45.69	.09*	-.20**	.33**	-.01	.39**
(2) Private Self-Consciousness	2.77	20.53	.47**	.08	.10*	-.09*
(3) Public Self-Consciousness	-5.55	8.82	17.04	-.04	.32**	-.36**
(4) Eating Self-Determination	20.71	3.18	-1.46	85.42	.26**	.37**
(5) Intentions to Control Body Weight	-.09	.63	1.87	3.41	1.96	-.14**
(6) Weight Goals Orientation	27.19	-4.22	-15.19	34.82	-1.98	104.82

Note. * $p < .05$, ** $p < .01$. Values above diagonal are correlations, below diagonal are covariances, and in diagonal are variances.

Test of the Hypothesized Model

Path analyses were conducted on the hypothesized model and revealed an overall excellent fit to the data: $\chi^2_{(3,553)} = 1.62, p = .655$; CFI = 1.00; RMSEA = .00; SRMR = .01). In addition, all estimated parameters for the direct effects were statistically significant, with the exception of the path between private self-consciousness and weight goals orientation. In addition to direct effects, most parameters for the total effects were automatically generated by the software. However, some manual computations were necessary to determine indirect effects and their standard errors. When necessary, Sobel's (1986) method was applied to compute these parameters. In some more complex indirect relationships, no computation method was available for the computation of standard errors and they were thus approximated using recommendations by Kline (2005) and Sobel (1986). Figure 2 illustrates the standardized direct effects, and the effects decomposition is presented in Table 7 with unstandardized coefficients, standard errors, standardized coefficients, significance level and computation method.

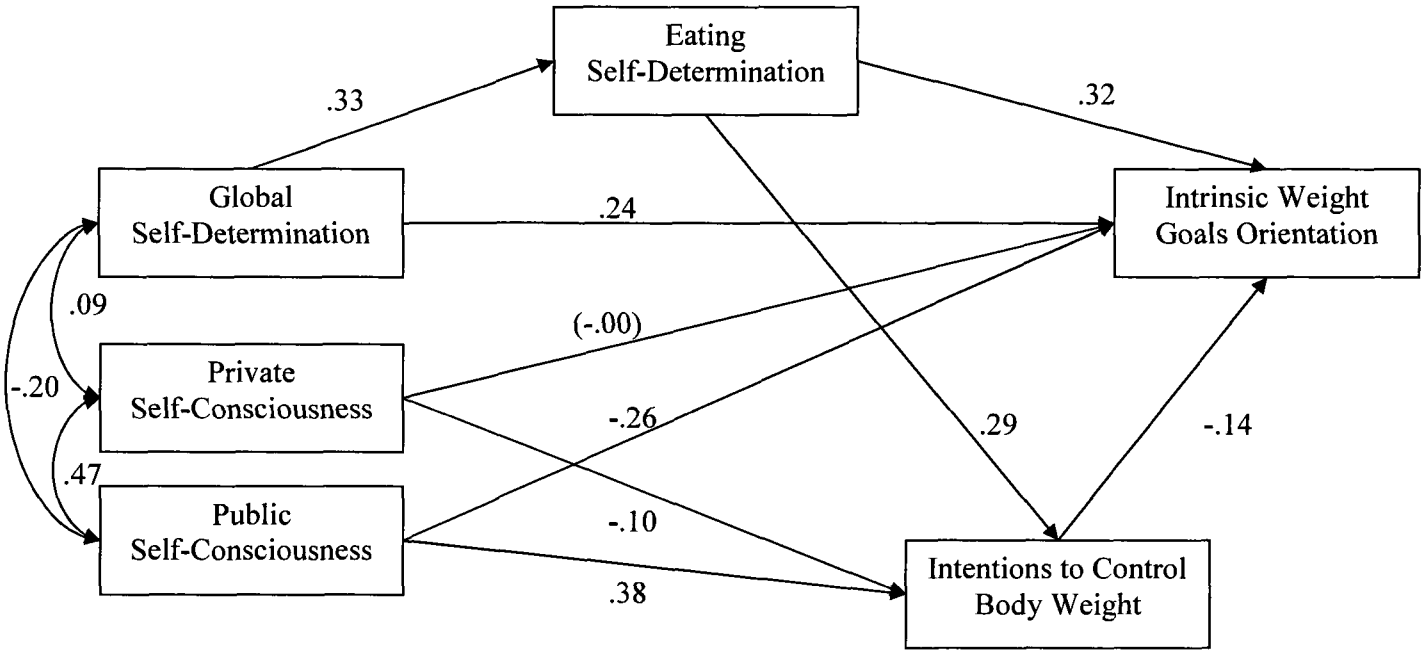

Figure 2. Study 2: Tested model

Table 7

Study 2: Effects Decomposition for the Hypothesized Model

	Endogenous variables								
	Eating Self-Determination			Intentions to Control Body Weight			Weight Goals Orientation		
Causal variable	UST	SE	ST	UST	SE	ST	UST	SE	ST
Global Self-Determination									
Direct effect	.453**	.055	.331	–	–	–	.358**	.059	.236
Total indirect effects	–	–	–	.020**	.004	.095	.139**	.027[c]	.092
Total effect	.453**	.055	.331	.020**	.004	.095	.497**	.058	.328
Private Self-Consciousness									
Direct effect	–	–	–	-.032*	.014	-.104	-.006	.093	-.003
Total indirect effects	–	–	–	–	–	–	.032[a]	.017[b]	.014
Total effect	–	–	–	-.032**	.014	-.104	.026	.093	.011
Public Self-Consciousness									
Direct effect	–	–	–	.130**	.015	.384	-.633**	.110	-.255
Total indirect effects	–	–	–	–	–	–	-.129**	.040[b]	-.052
Total effect	–	–	–	.130**	.015	.384	-.762**	.104	-.307
Eating Self-Determination									
Direct effect	–	–	–	.043**	.006	.286	.350**	.043	.315
Total indirect effects	–	–	–	–	–	–	-.043**	.014[b]	-.039
Total effect	–	–	–	.043**	.006	. .286	.307**	.043[c]	.276
Intentions to Control Body Weight									
Direct effect	–	–	–	–	–	–	-.992**	.286	-.135
Total indirect effects	–	–	–	–	–	–	–	–	–
Total effect	–	–	–	–	–	–	-.992**	.286	-.135

Note. [a]$p < .10$, *$p < .05$, **$p < .01$.

[b]Sobel; [c]approximation; UST = unstandardized; SE = standard error; ST = standardized.

Direct and indirect effects on intentions to control body weight. In terms of observed direct effects, private self-consciousness predicted lower intentions to control body weight while public self-consciousness predicted higher intentions to control body weight. Eating self-determination also predicted higher intentions to control body weight. Although no direct effect was hypothesized, global self-determination had a positive indirect effect on intentions. In total, the hypothesized model predicted 18.6% of the variance of intentions to control body weight in the current sample.

Direct and indirect effects on weight goals orientation. Global self-determination directly predicted a more intrinsic weight goals orientation and also presented a statistically significant indirect effect through eating self-determination and intentions to control body weight. Private self-consciousness did not significantly predict a more intrinsic weight goals orientation. However, the model suggested a small indirect effect through intentions to control body weight that was marginally significant (bilateral $z = 1.91$, $p = .056$). Public self-consciousness predicted a more extrinsic weight goals orientation directly and indirectly, through intentions to control body weight. Eating self-determination predicted an intrinsic weight goals orientation positively through a direct effect, but negatively through an indirect effect with intentions to control body weight. Finally, high intentions to control body weight directly predicted a more extrinsic weight goals orientation. Overall, these direct and indirect effects predicted 32.2% of the variance of weight goals orientation in the current sample.

Global and eating self-determination. As expected, a direct effect from global self-determination predicted eating self-determination. This effect was of the same magnitude and size as the previously reported Pearson zero-order correlation between the two variables, but constituted an analyzed association (i.e., it was conferred directionality) in the current

model. According to the hypothesized model, global self-determination explained 11.0% of the variance of eating self-determination.

Unanalyzed associations. In path analysis, the relationships between exogenous variables are typically left unanalyzed, in the sense that no inference is made about directionality. As such the hypothesized model does not provide any information on whether global self-determination could predict self-consciousness or vice-versa, or if they are better predicted by another untested variable. Nonetheless, the model accounts for their covariance and thus suggested that global self-determination was positively associated with private self-consciousness and negatively associated with public self-consciousness. Both forms were positively related to one another.

Alternative models. In any attempt to conduct SEM, the existence of alternative models must be addressed and discussed. While several alternative models are possible when considering the combination of tested variables, three of the more pertinent alternative models were evaluated. Alternative model 1 tested a structure in which a direct path was added between global self-determination and intentions to control body weight. As Table 8 demonstrates, the change in model fit was not significant ($\Delta\chi^2 = -.28$, $p = .597$). As this model was neither statistically nor conceptually superior (less degrees of freedom implies more complexity), it was rejected.

Next, alternative model 2 examined the possibility that intentions to control body weight could predict eating self-determination, rather than the opposite (as stated in the hypothesized model). There was a significant decrease in model fit ($\Delta\chi^2 = 6.38$, $p = .012$), suggesting that the hypothesized model was statistically superior.

Finally, alternative model 3 tested the possibility that weight goals orientation could predict intentions to control body weight, rather than the opposite as stated in the hypothesized model. The change in model fit was negligible ($\Delta\chi^2 = -.15, p = .699$), suggesting that this was a plausible alternative model.

Table 8

Study 2: Comparison of Fit Indices across Models

Model	χ^2 (df)	CFI	RMSEA	SRMR	$\Delta\chi^2$
Hypothesized Model	1.62 (3)	1.00	.00	.01	
Alternative Model 1	1.34 (2)	1.00	.00	.01	-.28
Alternative Model 2	8.00 (3)	.991	.06	.02	6.38*
Alternative Model 3	1.47 (3)	1.00	.00	.01	-.15

Note. *$p < .05$. CFI = comparative fit index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual.

Discussion

In support to Study 1 and in line with the propositions of Table 1, this study hypothesized that public self-consciousness should be associated with low levels of global self-determination and with detrimental aspects of self-regulation (e.g., the pursuit of extrinsic goals) and that private self-consciousness should be associated with high levels of global self-determination and positive aspects of self-regulation (e.g., the pursuit of intrinsic goals). Accordingly, the purpose of Study 2 was to examine how global self-determination and self-consciousness related to intentions and goal content in the context of dieting and weight management. Overall, the findings from structural equation modeling (path analysis) supported the proposed hypotheses.

With regard to the preliminary analyses, zero-order correlations between global self-determination and both forms of self-consciousness replicated Study 1's findings in terms of magnitude and direction. The correlations between eating self-determination and self-consciousness were also of the expected size and magnitude. Furthermore, as reported in previous studies (Pelletier & Dion, 2007; Pelletier et al., 2004), global self-determination and eating self-determination were moderately correlated. All the correlations with intentions and goal orientation were of the predicted size and direction, with the exception of private self-consciousness which was positively associated intentions and negatively associated with goal orientation. Investigation of the path analyses provided further information on this finding.

Structural equation modeling supported all hypotheses in size and direction with the exception of the path from private self-consciousness to weight goals orientation which was not statistically significant. The lack of statistical significance in this case is probably less an

issue of statistical power but more an issue of effect size as the observed direct effect was of 0. A possible explanation for this may be that the effect of private self-consciousness on weight goals orientation operates through other variables associated with it such as global self-determination and intentions to control body weight. The relationship between private self-consciousness and global self-determination in this model was unanalyzed as the two exogenous variables are hypothesized to operate at the disposition level; however, the path model did provide empirical evidence of an indirect effect of private self-consciousness on weight goals orientation through intentions to control body weight (although this finding was marginally significant).

Another noteworthy finding pertains specifically to the direct effect of private self-consciousness on the intentions to control body weight. Although the zero-order correlation between the two variables was positive ($r = .10$), the estimated direct effect in the path model was negative (-.104) and thus in support of hypothesis "H1". This appears to be a classic case of negative suppression (Smith, Ager & Williams, 1992). In this instance, the cause of suppression is most likely the high correlation between private and public self-consciousness. As such, the relationship between private self-consciousness and intentions to control body weight appears to be positive when taken on its own, but when the path model accounts for the effects of public self-consciousness, the resulting estimated parameter takes on a negative sign. As is common with negative suppression, this finding shows that omitting either one of the predictors in the analysis can lead to misleading results. This hypothesis of negative suppression is further supported by the fact that the estimated parameter for the direct effect between public self-consciousness and intentions to control body weight is actually greater in magnitude than the bivariate correlation between the two

variables. In terms of future research, this finding should be seriously taken into consideration when analysing data on private and public self-consciousness, in the sense that analysing the variables and their hypothesized outcomes with bivariate correlations could lead to false conclusions.

While the hypothesized model demonstrated an excellent fit to the data, an alternative model was shown to demonstrate an equivalent amount of fit. This alternative model, in which weight goals orientation predicted intentions to control body weight, rather than the opposite, warrants some discussion. Although the focus of the current investigation was not to determine whether intentions predicted goal content or vice versa, both possibilities needed to be examined quantitatively. Just as fit indices between both models were practically identical, so were the direct and indirect effects. As such, both models should be considered statistically very similar. In a theoretical sense, however, it is more logical to think of intentions to control body weight as an antecedent (but not a cause) to weight goals orientation. More specifically, intentions may be defined as the extent to which one plans to move toward a goal. Although one can exist without the other, it is more likely that intentions take place before goal content is determined.

Although the correlational design used in this study does not allow causality inferences, the present findings provide additional empirical evidence of the connections between private forms of monitoring and more self-determined forms of motivation, and between public forms of monitoring and less self-determined forms of motivation. Furthermore, this study suggests that although they are connected in how they operate on intentions and goals, both global self-determination and self-consciousness uniquely contribute to their predictions.

It is worth mentioning that the way in which intentions to control body weight were measured in this study may pose a notable limitation to the generalizability of the current findings. More specifically, the operational definition of intentions in the context of this study could be confounded with a measure of importance attributed to the control of body weight, which is conceptually distinct from intentions per se. This problem may be further exacerbated by the fact that intentions were measured via a single item measure. Notwithstanding, the overall results of Study 2 corroborated the findings from Study 1 and, more importantly, provided empirical evidence in support for the ideas proposed in this thesis. To resolve the issues arising from the first two studies, Study 3 and Study 4 will test this thesis's ideas directly within an experimental setting, using behavioural outcomes.

In other words, Study 1 and Study 2 have to this point examined self-consciousness and self-determined motivation as general styles and have provided interesting insight concerning their association. However, self-determination theory and control theory also propose different consequences with regard to situational manipulations of public and private self-awareness, depending on one's motivational orientation. To further explore these propositions, Study 3 and Study 4 were designed to test the propositions of Table 1 with regard to the interaction of situational self-awareness and self-determination (columns B and C)

CHAPTER FOUR:

STUDY 3

So far, Study 1 and Study 2 have provided empirical evidence suggesting connections between global self-determination and self-monitoring, in the sense that private self-consciousness appears to be associated with higher levels of self-determination while public self-consciousness appears to be associated with lower levels of self-determination. Consistent with SDT, the previous findings suggested that higher levels of global self-determination were associated with more intrinsically oriented weight goals and more intentions to control body weight. Consistent with CT, public self-consciousness was associated with more extrinsically oriented weight goals and more intentions to control body weight. Private self-consciousness, conversely, was associated with fewer intentions to control body weight and was somewhat indirectly and marginally associated with more intrinsically oriented weight goals. Although the research presented so far portrayed the joint as well as divergent roles of global self-determination, private self-consciousness and public self-consciousness with regard to correlates of self-regulation such as goals, it does not address how one's motivational orientation and the two types of self-consciousness interact in the self-regulation of behaviour. The current study was designed to address this question.

Because a situational increase of focus on the private side of the self may differentially affect individuals depending on their level of global self-determination, Study 3 was designed to test a moderation model of self-determination and self-awareness. It is hypothesized that increasing situational private self-awareness should trigger internal narratives that correspond to one's motivational orientation and regulation style. Accordingly, this increase should make individuals with low levels of global self-

determination more aware of their extrinsic goals and reference values, thus fostering a behavioural regulation that is more coherent with these goals, and making self-regulation more successful. In contrast, an increase in private self-awareness for individuals with high levels of global self-determination, which should make them more aware of their intrinsic goals and reference values, should have relatively little effect, as their behavioural regulation is already thought to be coherent with their goals.

The present study proposes an experimental test of these ideas. In this investigation, restrained eaters are confronted to tempting unhealthy food in a laboratory setting. It is expected that, compared to a control condition, an increase in private self-awareness should foster more successful self-regulation for individuals low in global self-determination, thus significantly reducing their food intake. Conversely, it is expected that, compared to a control condition, an increase in private self-awareness should have little effect on the already successful self-regulation of individuals high in global self-determination, thus not affecting food intake. In statistical terms, this study suggests that the predictive value of private self-awareness on food intake in restrained eaters will be moderated by global self-determination. Note that as the level of self-determined motivation toward the regulation of eating behaviours ("eating self-determination") may influence the amount of food intake (Pelletier & Dion, 2007; Pelletier et al., 2004), it should be included in the analyses as a covariate.

Method

Participants and Procedure

Undergraduate students ($N = 37$; 31 females, 6 males) enrolled in introductory psychology courses at the University of Ottawa participated in this study. Participants' ages

ranged from 17 to 23 years (M= 19.6, SD= 1.6). At the beginning of the semester (time 1), participants completed a questionnaire package in exchange for partial credit. The data were collected through an online testing system as part of the introductory psychology curriculum. Approximately 1 to 3 months later, participants were invited to take part in a laboratory study (time 2), and were randomly assigned to either a control condition or an increased private self-awareness condition. After taking part in the study, participants completed manipulation checks and were debriefed.

Time 1 Measures

Global Motivation Scale (GMS). This is the same instrument which was used previously. Please refer to its description in Study 1. To estimate internal consistency in the present sample, a Cronbach's alpha coefficient was computed for the combined motivation subscales in the global self-determination index, i.e. for all the items together, and was found to be of acceptable magnitude: .79.

Regulation of Eating Behaviors Scale (REBS). This is the same instrument which was used previously. Please refer to its description in Study 1. Internal consistency of the scale in the context of the present study was acceptable, as suggested by the computed Cronbach's alpha of .88 for the combined items.

Restrained eating. In order to specifically invite restrained eaters to the laboratory, participants were screened for their thoughts about dieting. The three items concerned with dieting from the drive for thinness subscale of the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) were used for this purpose: "I think about dieting", "I am terrified of gaining weight", "I am preoccupied with the desire to be thinner". As a pre-selection measure, a composite score was created (α = .81) by computing the average of all three items

(each rated on a scale of 1 "never" to 6 "always"). To be invited to the study, participants had to have a minimum mean score of 3.00 on the composite variable.

Experimental Manipulation

Participants were invited to participate in the laboratory experiment under a false pretext in order to minimize bias regarding their food intake. They were instructed that the study focused on the detection of stereotypes. Participants sat at a computer and watched a television show for 25 minutes (an episode of the popular cartoon "The Simpsons"; the same episode for all participants).

At the start of the laboratory session, participants were handed a full bag of freshly popped popcorn (Orville Redenbacher's Popcorn, regular size bag). To minimize error variance, all bags were the same size, and microwaved in the same oven for the same amount of time. As all participants were restrained eaters, the tempting popcorn was thought to create a situation with self-regulatory demands in which participants would try to restrain from eating excessive amounts of food. The popcorn was introduced under the false pretext of manipulating participants' mood. More specifically, participants were told that:

> "Studies have shown that mood plays a capital role in the perception of stereotypes. In order to ensure that every participant is in a similar mood, we will try to replicate a typical TV-watching environment around you. We will therefore close the door behind you for a maximum of silence, have you sit in a comfortable position, give you some popcorn for your enjoyment, and adjust the sound and lighting to your liking."

The dependant variable was operationalized as the volume of popcorn that remained following the manipulation. The operational definition of the dependent variable by itself presented several challenges. First, exploded popcorn weighs practically nothing, so even large variations of food intake could not be detected by weighing the popcorn. The solution was thus to evaluate the volume of popcorn rather than its weight. Second, although it is of minimal proportion, the volume of consumable popcorn can vary from one bag to another depending on the amount of unexploded kernels. This measurement error was however expected to be randomly distributed across conditions and was not deemed problematic. In addition, the same measurement tool was used to measure the volume of every bag, namely a two-litre measuring cup. The post-manipulation amount of popcorn was measured in units of millilitres. Finally, for reasons of hygiene and to appear as natural as possible, the freshly popped bags of popcorn were opened in front of the participants. Consequently, it was not possible to perform pre-manipulation versus post-manipulation measurements of popcorn. For ease of interpretation, a variable of food intake was computed for each participant by subtracting the amount of remaining popcorn from a constant that represented the maximum possible volume of remaining popcorn (i.e., if nothing was eaten).

Situational increases of private self-awareness were manipulated by presenting participants with a reflection of their own face (Scheier & Carver, 1983). In the increased private self-awareness condition, participants could see their own live image (bust length, frontal) on the bottom right corner of the computer screen while watching they were watching the episode. This was not the case for the control condition. As a pretext, participants were told that the live image of their face on the screen served the purpose of tracking their eye movements through a webcam. Although the presence of a camera by

itself is traditionally associated with public aspects of self-monitoring (Scheier & Carver, 1983; Carver & Scheier, 1985), the focus in this manipulation is thought to center on private aspects of the self for two reasons. First, participants were not told that they were filmed or observed, but rather that their eye movements were being tracked. Participants have little control over their eye movement and their tracking involves no aspect of self-presentation or image. Second, the live image on the screen focused the participants' attention away from the small and discrete webcam (which is quite different from a large filming video camera, as used in classic studies) and completely on themselves.

Post-Manipulation

After watching the 25 minutes episode, the volume of remaining popcorn was measured and participants were asked to complete a brief manipulation check questionnaire prior to debriefing. More specifically, participants answered three manipulation check questions. The first set was designed to verify that private self-awareness had indeed been increased for participants in the experimental condition ("During the task, I was quick to notice changes in my mood" and "I felt aware of my thoughts and feelings during the task."). The second was designed to verify that the cover story was believable ("I felt the experimenter was honest and truthful in describing the study"). All questions were answered on a scale of 1 (completely disagree) to 7 (completely agree).

Results

Data Preparation and Preliminary Analyses

Before proceeding with the main analyses, steps were taken to ensure that the basic assumptions for multiple regression were respected. Descriptive statistics appear in Table 9.

Table 9

Study 3: Descriptive Statistics

Variable	Mean (SD)	Skewness	Kurtosis	Observed Range
Time 1				
Global Self-Determination	8.31 (4.97)	-.065	.629	-4.67 / 20.33
Eating Self-Determination	9.46 (8.97)	-.154	.086	-13.50 / 26.25
Restrained eating	4.37 (1.10)	.156	-1.357	3 / 6
Time 2				
Food intake (mL)	1128.79 (842.90)	.281	-1.134	0 / 2600

Note. SD = standard deviation, standard error for skewness = .409, standard error for kurtosis = .798

Missing data and outliers. No significant amount of missing data was detected in the sample. As multiple regression is particularly sensitive to multivariate outliers, the dataset was screened using both Mahalanobis distances and centered leverage values (h_{ii}), as recommended by Tabachnick and Fidell (2001) and Lunneborg (1994). Four instances of aberrant multivariate outlier cases were detected and removed, resulting in a final sample size of 33. The dataset was further screened for univariate outliers using a criterion of z ±3.29 SD, and no other outlier cases were detected.

Multivariate normality. The data were screened for evidence of bivariate nonlinearity and heteroscedasticity. All bivariate scatterplots suggested fairly linear and homoscedastic relationships between the variables of interest. As detailed in study 2, univariate normality was investigated through skewness and kurtosis. These values appear in Table 9. No departures from normality were detected. Finally, no evidence of multicollinearity was found.

Manipulation Checks

In general, participants believed the cover story explained by the experimenter. Across both conditions, response to the honesty manipulation check question ranged from 5 to 7 ($M = 6.70$, $SD = .59$). Results from the manipulation checks also indicated that participants in the increased private self-awareness condition reported higher scores in the private self-focus questions composite ($M = 5.19$, $SD = 1.01$) compared to participants in the control condition ($M = 4.50$, $SD = 0.90$). This mean difference was statistically significant, $t_{(31)} = -2.06$, $p = .048$. Finally, as time of day could be hypothesized to have an influence on food intake, it was coded (each hour from 9:00 am to 3:00 pm for a total of 6 groups) and used as an independent variable to predict the amount of popcorn eaten by participants in a

one-way ANOVA. The results suggested that time of day did not have a significant impact on food intake, $F_{(5,27)} = 1.41$, $p = .243$. Finally, there was no statistically significant difference between the amount of food intake between males and females ($t_{(35)} = -1.57, p = .125$).

Moderated Multiple Regression

A moderated multiple regression analysis was used to test the main hypotheses of this study with regard to the prediction of food intake. The predictor was private self-awareness, a categorical variable, and was coded as 0 for the control condition and 1 for the experimental condition. The moderator was global self-determination, a continuous variable. The computational procedures suggested by Hayes and Matthes (2009) were used to compute estimates of effect size and probe for an interaction effect. Results of the moderated multiple regression are reported in Table 10. A main effect was found for condition ($t_{(28)} = -2.88, p = .008$), suggesting that participants had a general tendency to eat less popcorn in the increased private self-awareness condition. A main effect was also found for global self-determination ($t_{(28)} = -2.66, p = .013$), suggesting that participants were less likely to eat popcorn as their levels of global self-determination increased. Finally, a statistically significant interaction was found, suggesting a moderation effect ($t_{(28)} = 2.21, p = .035$). Adding the interaction term to the multiple regression contributed a sizeable increase of .12 to the total R^2.

Following the recommendations by Hayes and Matthes (2009), the statistically significant interaction was probed at three levels of global self-determination (GSD), namely at one standard deviation below the mean ("low GSD"), directly at the mean ("moderate GSD"), and at one standard deviation above the mean ("high GSD"). Results revealed that a

strong conditional effect of private self-awareness on food intake was present for low GSD ($t_{(28)}$ = -2.95, p =.006). A more modest conditional effect was found for moderate GSD ($t_{(28)}$ = -2.06, p =.048). Finally, no conditional effect was detected for high GSD ($t_{(28)}$ = 0.12, p =.907). Based on the technique outlined by Aiken and West (1991), simple slopes were graphed to show the moderating effect of global self-determination on the relationship between private self-awareness and food intake. They are presented graphically in Figure 3.

Table 10

Study 3: Regression Estimating Food Intake from Experimental Condition, Global Self-Determination, and their Interaction

Variable	Coefficient	*SE*	*t*	*p*
Constant	2391.44	494.18	4.84	<.001
Private Self-Awareness (PSA)	-1648.01	572.13	-2.88	.008
Global Self-Determination (GSD)	-120.31	45.19	-2.66	.013
Interaction: PSA X GSD	127.51	57.62	2.21	.035

Note. $R^2 = .29$, $F_{(4,28)} = 2.89$, $p = .040$; SE = standard error; eating self-determination entered as covariate. Coefficients are unstandardized.

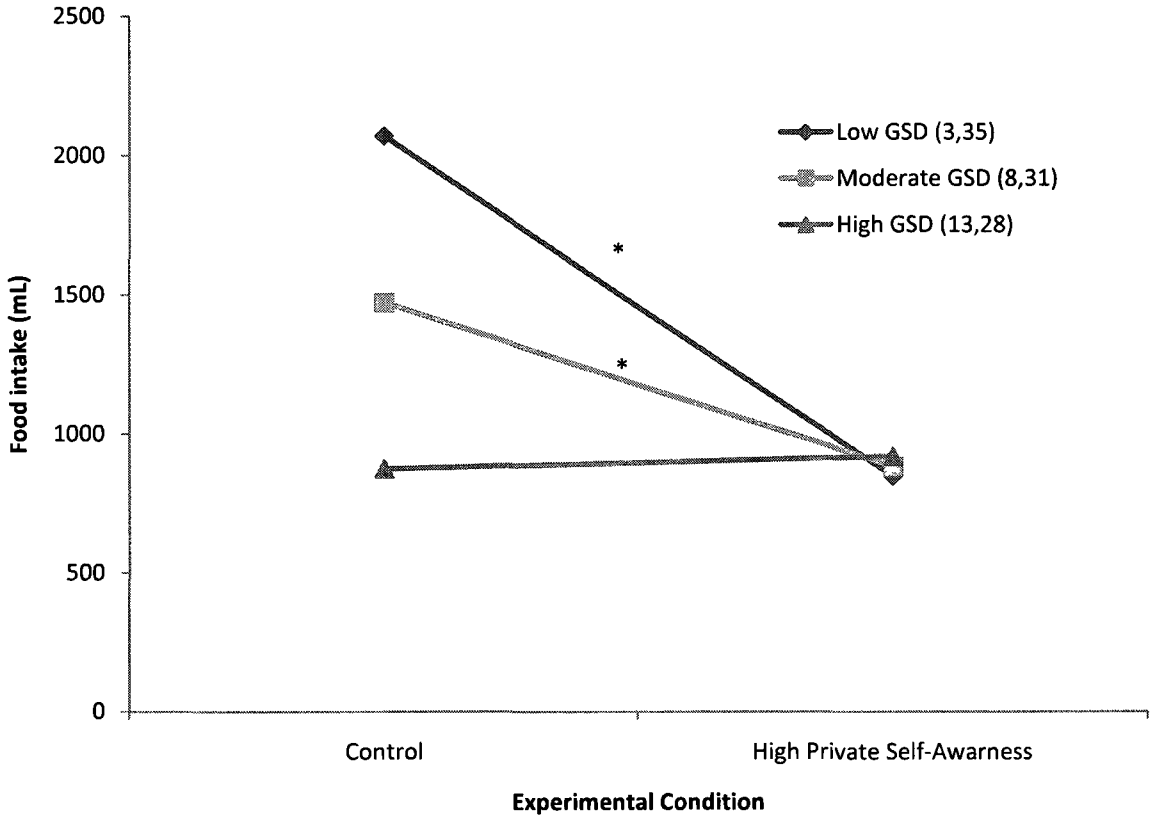

Figure 3. Study 3: Simple slopes showing the moderating effect of global self-determination (GSD) on the relationship between private self-awareness and food intake.

* $p < .05$

Discussion

This study showed that a situational increase of private self-awareness could help participants to better regulate their eating behaviours in the face of temptation, but that this effect was moderated by global self-determination. Results suggested that private self-awareness was associated with a reduction of food intake for participants low/medium in global self-determination, while having no effect for participants high in global self-determination.

These findings provide support for the idea that a private self-focus may facilitate internal narratives, leading individuals to rely on their motivational orientation and regulation style. More specifically, for individuals low in global self-determination, private self-awareness appeared to foster more successful self-regulation, possibly because it facilitated conscious thought on their external goals and reference values. However, for individuals high in global self-determination, even if it facilitated conscious thought on their internal goals and reference values, private self-awareness had no beneficial effect on self-regulation. This may be because these individuals already operate with behaviours that are coherent with their goals. This is further corroborated by the findings that individuals with high levels of global self-determination resisted eating large amounts of food regardless of whether they were in the control condition or the high private self-awareness condition. Overall, the results from this study suggest that the conscious thought activated by private self-awareness may only be beneficial for those who have a nonself-determined style of behavioural regulation.

Despite its contribution, the current study has noteworthy limitations. It terms of methodology, the dependent variable was not optimally operationalized. For instance,

although probably randomly distributed, a non-trivial quantity of measurement error may be present because of unexploded kernels in popcorn bags. In addition, the use of an electronic measurement unit would have been preferable to a visual measure of volume (i.e., human error). Finally, a single post-manipulation measure of food intake (i.e., without pre-weighting) is suboptimal. Another limitation pertains to the experimental manipulation; it is conceivable that some participants might have thought that "tracking eye movements" was indicative of some form of social judgement or peer evaluation, thus inducing increases of public self-awareness. In sum, notwithstanding the current study's insights on the role of private self-awareness in the self-regulation of behaviours, it did not address the potential influence of public self-awareness and its interaction with global self-determination.

In light the aforementioned limitations, a fourth study was designed to test the interaction of global self-determination with situational increases of public as well as private self-awareness.

CHAPTER FIVE:

STUDY 4

Studies 1 through 3 have provided support for the idea that, while operating at different levels, more self-determined forms of motivation function in cooperation with private forms of monitoring while less self-determined forms of motivation function concurrently with public forms of monitoring.

Consistent with SDT, findings from the previous studies have suggested that high global self-determination is associated with more intentions to control body weight along with the adoption of more intrinsic weight goals, as well as related to a more successful self-regulation of eating behaviours, regardless of situational increases of private self-awareness.

With regard to control theory, the idea that monitoring the private self (private self-consciousness, private self-awareness) may be associated with correlates of successful self-regulation has been only partially supported. While results have suggested that private self-consciousness is related to higher levels of global self-determination and, to some extent, to a more intrinsic weight goals orientation, experimental findings also suggest that a situational increase of private self-awareness is not always necessary (e.g., when global self-determination is high) for successful self-regulation.

These nuances and interactions have not yet been tested with regard to situational increases of public self-awareness. Although public self-consciousness was associated with more intentions to control body weight in Study 2, it was also associated with more extrinsically oriented weight goals, which can lead to self-regulation of behaviour in the short term, but can also have a detrimental effect on self-regulation of behaviour in the long term (Kasser & Ryan, 1996; Sheldon et al., 2004). To further extend the findings from

previous studies, an investigation of the interaction between global self-determination and situational increases of both private and public self-awareness is thus warranted. In addition to addressing the aforementioned issues, the current study also aimed to improve on the methodological limitations of Study 3.

Control theory suggests that situational increases in public self-awareness should direct individuals to focus on self-presentation, image and social pressures (Scheier & Carver, 1983). In the context of the regulation of eating behaviours in a laboratory setting, an increase in public self-awareness could act favourably for participants, leading them to eat fewer amount of an unhealthy food to preserve their self-image. However, based on SDT, low levels of global self-determination also contribute to making behaviour more consistent with external standards such as image and conformity, and thus an increase in public self-awareness for those with already low levels of global self-determination may not have a significant impact. In contrast, high levels of global self-determination are often indicative of behaviours coherent with personal goals and values. Accordingly, an increase in public self-awareness may have an impact, albeit a controlling one, only for those with high levels of global self-determination.

The present study proposes to experimentally test of this suggestion as well as replicate the findings of Study 3. Study 4 was thus designed to supplement Study 3 by adding an experimental condition in which a situational increase of public self-awareness was manipulated. Based on Study 3's findings, it was hypothesized that global self-determination should moderate the relationship between private self-awareness and food intake in the sense that an increase in private self-awareness would be more beneficial to individuals with low levels of global self-determination. In accordance with past studies on

the influence of public self-awareness, it was also hypothesized that global self-determination should moderate the relationship between public self-awareness and food intake in the sense that an increase in public self-awareness would be have a stronger impact for individuals with high levels of global self-determination than for individuals with low levels of global self-determination.

To improve on Study 3, a number of statistical controls were also introduced in this study. Eating self-determination was kept as a covariable, but participants' levels of private and public self-consciousness were also included in the analysis. Additionally, the level of hunger when entering the laboratory was also controlled for.

Method

Participants and Procedure

Undergraduate students ($N = 71$; 41 females, 29 males, 1 undeclared) enrolled in introductory psychology courses at the University of Ottawa participated in this study. Participants' ages ranged from 17 to 43 years ($M = 19.5$, $SD = 3.5$). Participants completed a questionnaire at the beginning of the semester (time 1) in exchange for partial credit. Data collection was carried out via an online testing system as part of the introductory psychology curriculum. Participants were later invited to take part in a laboratory study (time 2), and were randomly assigned to one of three conditions: a control condition, a public self-awareness condition, or a private self-awareness condition. After taking part in the study, participants completed manipulation checks and were debriefed.

Time 1 Measures

Global Motivation Scale (GMS). This instrument was used in all previous studies. Please refer to its description in Study 1. Cronbach's alpha in the current sample was .73.

Regulation of Eating Behaviors Scale (REBS). This is the same instrument which was used previously. Please refer to its description in Study 1. Cronbach's alpha in the current sample was .80.

Revised Self-Consciousness Scale (SCS). This instrument was also used previously. Please refer to its detailed description in Study 1. In the context of the present study, Cronbach's alpha was .65 for private self-consciousness and .72 for public self-consciousness. In this study, so that the all covariates may be on a similar metric, the scores from the SCS were averaged together rather than summed (Study 2).

Intentions to Control Body Weight. To establish a link with Study 2, participants' intentions to control body weight and managing their body weight were assessed with the same item: "How important is it for you to control your body weight?" Participants rated this item on a scale of 1 "Not important at all" to 7 "Extremely important". To qualify for the study, participants had to have a minimum score of 5 on this item.

Experimental Manipulation

For the sake of consistency, the experimental manipulation of this study was based in many ways on the manipulation carried out in Study 3, with a few improvements. Participants were invited to participate in the laboratory experiment under the same false pretext of a study on the detection of stereotypes. Participants watched the same "Simpsons" episode presented in Study 3. A modification was added to the study description to allow some level of control over participant's feelings of hunger. Under the pretext that a saliva sample would be taken, participants were instructed to refrain from eating two hours prior to their participation, as well as avoid any physical activity or unduly stress (to add to the cover story). Upon their arrival, participants completed a pre-manipulation questionnaire in which,

with filler items (for avoid raising suspicions about food), participants were asked the extent to which they were hungry.

At the beginning of the session, participants were given a full box of "Lay's Stax" regular flavour potato crisps. All boxes were of the same size, weight and flavour. As all participants reported high intentions to control body weight, the crisps were thought to create a situation with self-regulatory demands much like the popcorn did in Study 3. The same pretext for the introduction of food (mood) was used in this study.

The "Lay's Stax" were selected as their use solved many of the issues raised with the bags of popcorn in Study 3. For instance, the crisps could be weighted, which introduced the use of a digital scale (Nexxtech Mini Digital Scale, product #6313014, distributed by Orbyx Electronics, LLC) rather than a visual measure of volume. Pilot trials revealed that the scale could detect the removal of even a single crisp from the box. The measurement error published with the scale manual stated a variance of .2 grams; however pilot trials suggested that measurement error varied up to .5 grams. Nonetheless, this variation was negligible. Another advantage of using the crisps was that the box could be pre-weighted before the experiment, and weighted again post-manipulation. This helped ensure that error variance was reduced to a minimum. The packaged crisps were opened in front of participants, for the same reasons explained in Study 3, but the lid was kept and replaced for post-manipulation weighting. Weighting was done in a separate room away from participants to protect the cover story. The dependant variable for this study was thus operationalized as the difference between the pre-manipulation and post-manipulation weights of "Lay's Stax" in grams.

Situational increases of private self-awareness were manipulated by presenting participants with a reflection of their own face in a way similar to Study 3. Because the

information about eye tracking may have led to ambiguities in Study 3, the cover story was modified in the current study. Participants were told that where they were sitting with regard to the screen had an impact on their visual capacity to detect some small subtleties that may appear during the cartoon, like words on a sign for example. As such, they were given the following instructions:

> "You should see a small webcam on the top of this monitor. It is important for you to know that the webcam is not recording anything, but it will project an image of yourself onscreen while you watch the episode. Try to remain at the center of that screen at all times. You are free to move around in your chair and get comfortable, but try to keep your face in the center of the screen; this is simply to establish a common base."

Situational increases of public self-awareness were manipulated by telling participants that during the screening of the episode, they would be monitored live by two researchers sitting in adjacent rooms, who will be coding their behaviours while they are watching the video. Scheier and Carver (1983) suggested that the presence of a camera and the feeling of being judged contributed to increase public self-awareness. To reinforce this idea, participants were told that they would briefly see these researchers before the episode began. To this end, a fake software was created ("Basic Live Feed") by the author to give participants the impression that a live connection was being established via a local area network. The two "live" researchers briefly appeared on the screen and greeted participants. These greetings were in fact pre-recorded video of confederates. Participants were thus told that:

> "A webcam has been installed on top of this monitor to broadcast a live signal. The webcam will be recording and transmitting your behaviour through the Basic Live Feed software provided by Logitech so that the researchers may be able to directly observe your behaviour."

Participants in the control condition were simply instructed to watch the cartoon episode and were given the crisps.

Post-Manipulation

After the episode, the crisps were weighted and participants were asked to complete a brief manipulation check questionnaire prior to debriefing. The first set of manipulation check questions was designed to assess increases of private self-awareness ("During the task, I generally paid attention to my inner feelings") and public self-awareness ("During the task, I felt more conscious of my physical appearance" and "During the task, I was concerned about what other people could think of me"). Another question was designed to verify that the cover story was believable ("I felt the experimenter was honest with me in describing the study"). All questions were answered on a scale of 1 (completely disagree) to 7 (completely agree).

Results

Data Preparation and Preliminary Analyses

Before proceeding with the main analyses, steps were taken to ensure that the basic assumptions for multiple regression were respected. Descriptive statistics appear in Table 11.

Missing data and outliers. No significant amount of missing data was detected in the sample. As in Study 3, the dataset was screened using both Mahalanobis distances and

centered leverage values (Lunneborg, 1994; Tabachnick & Fidell, 2001). Three instances of aberrant multivariate outlier cases were detected and removed from the analyses, resulting in a final sample size of 68. The dataset was further screened for univariate outliers using a criterion of z ±3.29 SD, and no other outlier cases were detected.

Table 11

Study 4: Descriptive Statistics

Variable	Mean (SD)	Skewness	Kurtosis	Observed Range
Time 1				
Global Self-Determination	6.81 (5.24)	.198	.551	-7.00 / 19.33
Eating Self-Determination	13.31 (9.92)	-.111	-.687	-9.75 / 33.25
Intentions to Control Body Weight	5.99 (0.74)	.024	-1.158	5 / 7
Private Self-Consciousness	2.67 (0.44)	-.149	.376	1.56 / 3.89
Public Self-Consciousness	2.93 (0.50)	-.160	-.084	1.57 / 4.00
Time 2				
Pre-Manipulation Hunger	3.50 (1.71)	.065	-.886	1 / 7
Food intake (g)	29.06 (29.61)	.988	.445	0.0 / 124.1

Note. SD = standard deviation, standard error for skewness = .291, standard error for kurtosis = .574

Multivariate normality. The data were screened for evidence of bivariate nonlinearity and heteroscedasticity. All bivariate scatterplots suggested fairly linear and homoscedastic relationships between the variables of interest. As explained previously, univariate normality was investigated through skewness and kurtosis. These values appear in Table 11. The skewness index of food intake (.988/.291 = 3.40) suggested that the variable was extremely skewed according to standard criteria (Kline, 2005; Tabachnick & Fidell, 2001). Following suggestions outlined by Tabachnick & Fidell (2001) as well as Kline (2005), the variable was transformed using a log base 10 algorithm. The log transformation was selected because it offers a substantial correction for skewness while leaving the variable intact for interpretation purposes. The transformation successfully reduced the skewness value by 52%, resulting in a more normally distributed outcome variable. In addition, the correlation between the original and transformed variables was sufficiently high to suggest high similarity ($r = .86, p < .001$). Consequently, the transformed variable was used in the main analyses of the study. All references to food intake in the main analyses pertain to the transformed variable.

Manipulation Checks

The honesty manipulation check question suggested that five participants had suspicions that the experimenter had not been truthful throughout the experiment. To prevent any bias in the results, these participants had to be excluded from the analyses, thus reducing the total sample to 63 for the main analyses. Similar to the analysis of Study 3, time of day was coded (each hour from 9:00 am to 5:00 pm for a total of 8 groups) and used as an independent variable to predict food intake. The results suggested that time of day did not have a significant impact on food intake, $F_{(7,55)} = 0.941$, $p = .483$.

Results from the manipulation checks indicated that the question intended to measure increases of private self-awareness ("During the task, I generally paid attention to my inner feelings") suggested statistically significant differences between the three conditions ($F_{(2,60)} = 3.711$, $p = .030$). Tukey's Honestly Significant Difference test was carried out for post-hoc analyses and indicated that a significant difference was present solely between participants in the control and public conditions ($\Delta M = -1.09$, $p = .023$). This suggested so some extent that the public self-awareness manipulation was successful. Of the two questions intended to measure increases of public self-awareness, no statistically significant finding was detected. Finally, there was no statistically significant difference between the amount of food intake between males and females ($t_{(68)} = -1.90$, $p = .062$).

Moderated Multiple Regression

A moderated multiple regression analysis was used to test the main hypotheses of this study. The predictor of food intake was experimental condition (control, private self-awareness, or public self-awareness). The moderator of this relationship was global self-determination, a continuous variable. A number of covariates were also included in the analyses to statistically control for their effect: eating self-determination (measured at time 1), private self-consciousness (time 1), public self-consciousness (time 1) and the level of hunger when entering the laboratory (time 2).

Because this moderated regression involved a categorical predictor of three levels (rather than two, as in Study 3) and a continuous moderator along with numerous covariates, traditional techniques of analysis were not applicable. In such scenarios, it is necessary to expand the moderated regression equation to include k-1 codes that represent the categorical variable, where k is the number of levels of that variable (Aguinis, 2004; West, Aiken, &

Krull, 1996). The coding scheme is an important step in this procedure and requires researchers to make decisions based on theory and study objectives. In the current context, the most interesting comparison is to investigate differences between (a) the control group and the public self-awareness condition and (b) the control group and the private self-awareness condition. Following the recommendations of Aguinis (2004) and West et al., (1996), two dummy coded variables were created to test these differences. The continuous moderator, global self-determination, was centered at the mean and interaction terms were computed from the product of the moderator variable with each dummy coded variable. Because this study involved a partial replication of Study 3 and clear directional hypotheses could be made, the t-tests were tested with one-tailed statistical hypotheses.

This procedure produced a regression that tested three main effects and two interactions: one main effect for each dummy coded variable, thus testing the main effects of the categorical predictor, one main effect for the centered continuous moderator, and the two interaction effects. The overall moderated regression equation was consistent with the prescriptions of Aguinis (2004) and West et al., (1996) for efficient tests of moderation using regression. Findings from this analysis are presented in Table 12.

Table 12

Study 4: Regression Estimating Food Intake from Experimental Conditions, Global Self-Determination, and their Interactions

Variable	Coefficient	*SE*	*t*	*p*
Constant	.363	.599	0.61	.274
Condition				
Control to Public	-.666	.206	-3.23	.001
Control to Private	.287	.185	1.55	.063
Global Self-Determination (GSD)	-.009	.028	-0.32	.382
Interactions				
Control/Public X GSD	-.063	.037	-1.17	.046
Control/Private X GSD	-.010	.039	-0.43	.483

Note. $R^2 = .30$, $F_{(9,53)} = 3.997$, $p = .001$; SE = standard error; eating self-determination, private self-consciousness, public self-consciousness and pre-manipulation hunger entered as covariates. Coefficients are unstandardized. T-tests are one-tailed.

A main effect was found between the control and public conditions ($t_{(53)}$ = -3.23, p =.001), suggesting that participants had a general tendency to eat less chips in the high public self-awareness condition compared to the control condition. No statistically significant main effect was found for the difference between the control and private self-awareness condition. In addition, no statistically significant main effect was detected for global self-determination. However, the analyses suggested an interaction effect between global self-determination and the difference between control-public conditions ($t_{(53)}$ = -1.17, p =.046). This interaction may be indicative of an underlying trend of moderation by global self-determination on public self-awareness and thus warranted further probing.

The technique recommended by Aiken and West (1991) for simple slopes analyses was used to investigate the interaction. Computations were carried out based on the asymptotic covariance matrix as outlined by Preacher, Curran and Bauer (2006), assisted by their accompanying online scripts (http://www.people.ku.edu/~preacher/interact/mlr2.htm). As in Study 3, the interaction was probed at three levels of global self-determination (GSD), namely at one standard deviation below the mean ("low GSD"), directly at the mean ("moderate GSD"), and at one standard deviation above the mean ("high GSD"). Results suggested progressively stronger conditional effects of public self-awareness on food intake as levels of global self-determination increased from low GSD (B = -0.76, SE = 0.23, $t_{(53)}$ = -3.38, p =.001), to moderate GSD (B = -1.10, SE = 0.36, $t_{(53)}$ = -3.05, p =.004), to high GSD (B = -1.44, SE = 0.53, $t_{(53)}$ = -2.69, p =.010). As these results are best demonstrated graphically, estimates of the dependent variable were computed and graphed using these slopes in Figure 4.

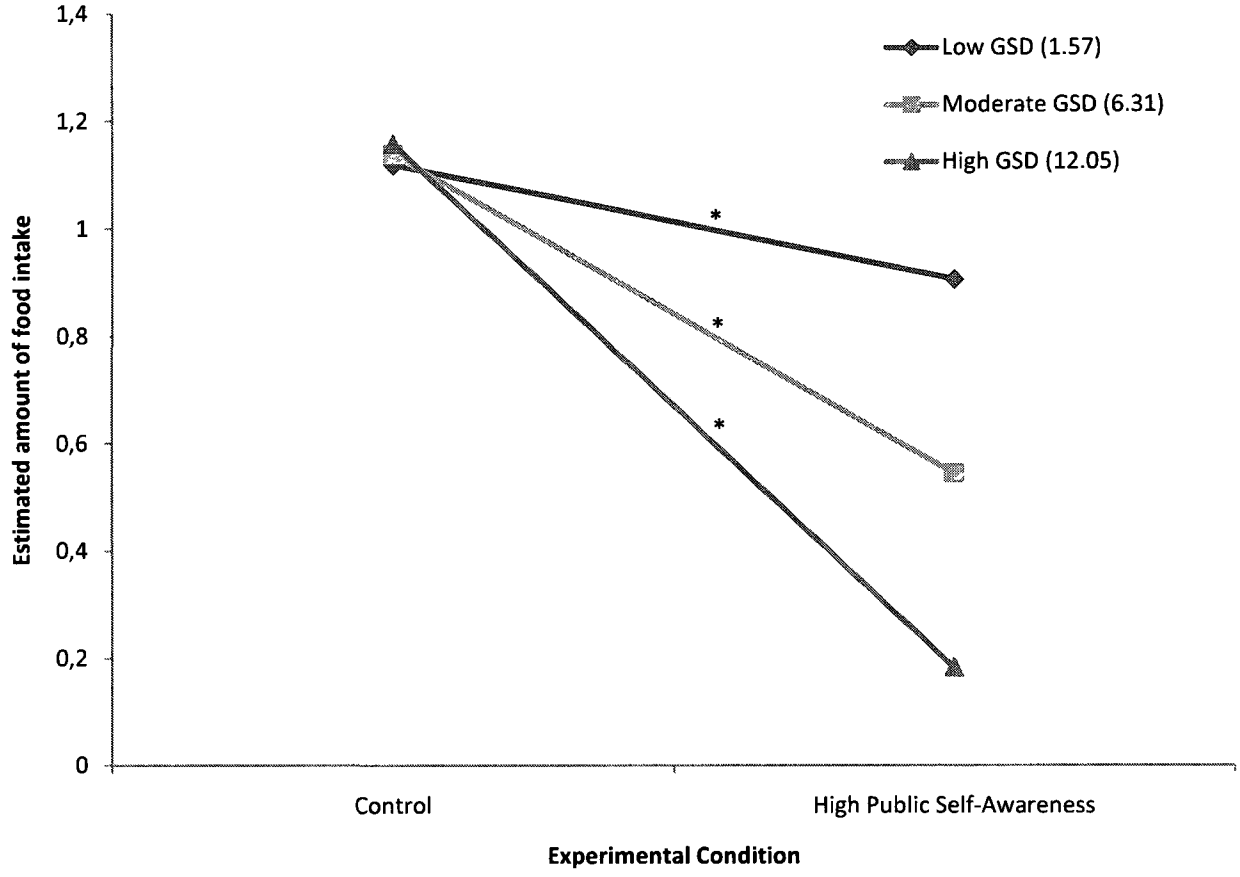

Figure 4. Study 4: Simple slopes showing the moderating effect of global self-determination (GSD) on the relationship between public self-awareness and food intake.

* $p < .05$

Discussion

This study hypothesized that global self-determination should moderate the relationship between private self-awareness and food intake, as seen in Study 3. It was also hypothesized that global self-determination should moderate the relationship between public self-awareness and food intake, in the sense that an increase in public self-awareness should be have a stronger impact for individuals with high levels of global self-determination compared to individuals with low levels of global self-determination.

Findings from the present experimental investigation supported the idea that a situational increase in public self-awareness could be associated with a lower food intake for individuals with intentions to control body weight. Furthermore, the current study provided evidence of an interaction suggesting that the impact of a situational increase in public self-awareness was stronger for individuals with high levels of global self-determination. This strength of this impact appeared to decrease as the level of global self-determination increased, thus suggesting that people low in global self-determination might be less susceptible to these situational increases of public self-awareness. One possible explanation for this may be that people with low levels of global self-determination already operate with behaviours oriented towards external standards, and thus public self-awareness had a marginal impact.

The current study could not replicate the results reported in Study 3. That is, there was no main effect detected for increases in private self-awareness and no interaction effects. A plausible explanation for this lack of replication may be that moderated multiple regressions, particularly those with numerous predictor variables such as the one tested in the current study, require very large sample sizes to achieve sufficient statistical power

(Aguinis, 2004). It is more difficult and complex to get such large samples when carrying out experimental investigations such as Study 4. Consequently, it may be that the effect of increases in public self-awareness, possibly because it is an external and controlling effect, is easier to detect than the effect of increases in private self-awareness, that may operate on a more subtle and internal level. More research is thus warranted to establish whether the lack of replication is due to insufficient power in the current study or a spurious effect in the previous study. Based on the overall findings of the current thesis and on theoretical reasoning, the power hypothesis appears to be the most plausible explanation, however.

Another possible explanation for the differences in Studies 3 and 4 may be in the criteria used to select the participants. In an effort to link the current findings to Study 2, participants were selected on the basis of their intentions to control their body weight (Study 2) rather than on their thoughts about dieting (drive for thinness) as measured by the Eating Disorders Inventory (EDI; Garner et al., 1983) in Study 3. Although both are similar, there are conceptual distinctions between people who are restrained eaters and people who have intentions to control their body weight. In particular, participants of Study 3 (restrained eaters) were more negatively concerned (i.e., "preoccupied") with their weight and thus may have been in a situation that required more self-regulatory demands as compared to participants in Study 4 who were selected based only on their intentions. Another possible distinction goes back to the results of Study 2. As private self-consciousness was negatively associated with intentions toward eating, it may be possible that a situational increase in private self-awareness had a negative impact on the participants' intentions to control their body weight thus leading them to disregard their intentions. This effect would not be present in Study 3 with the restrained eaters.

Overall, while pointing to the need for further research, this study provided additional empirical evidence of the interaction between self-determined motivation and self-monitoring.

CHAPTER SIX:

GENERAL DISCUSSION

Summary of Findings

Self-Determination and Self-Monitoring

The program of research proposed in this thesis aimed to examine how the organismic perspective from self-determination theory could supplement mechanistic approaches to self-regulation, by investigating the effects of one's motivation in conjunction with self-monitoring, in the prediction of successful self-regulation. As different motivational orientations are thought to rely on different mechanisms of behavioural regulation, two broad propositions were made.

Global self-determination and self-consciousness. First, it was suggested that different motivational styles should be associated with different loci of attention in general. More specifically, it was expected that global self-determination and private self-consciousness should be related in the sense that both foster coherence with one's self. By extension, it was also expected that global nonself-determination and public self-consciousness should be associated, as both drive individuals to focus on aspects that are external, and sometimes incoherent, with the self.

Global self-determination and self-awareness. Second, it was also suggested that situational increases of private and public self-awareness should differentially affect individuals depending on their global style of self-determination. On one hand, it was expected that an increase of private self-awareness should be more effective for the self-regulation of individuals with low levels of global self-determination (i.e., global nonself-determination). Little or no effect was expected for individuals with high global self-

determination as this reflects a motivational style that already fosters coherence with the self. On the other hand, it was expected that an increase of public self-awareness should have a stronger impact when levels of global self-determination are high. Little or no effect was expected with low levels of global self-determination as this reflects a motivational style that is already focused on external standards.

To test these propositions, four studies were designed and carried out. The following summarizes each study, its goals and its results.

Study 1

Study 1 provided a first look at the relationships between global self-determination, private self-consciousness and public self-consciousness via a meta-analytical review of several data samples. It was hypothesized that private self-consciousness should be positively correlated with global self-determination across samples. Conversely, it was hypothesized that public self-consciousness should be negatively correlated with global self-determination across samples. In agreement with previous studies, it was also expected that private and public forms of self-consciousness should be positively correlated. The series of meta-analyses provided effect sizes for these three relationships, supporting the hypotheses. Although it was not part of the main goal of Study 1, the relationships between forms of self-consciousness and more contextual types of self-determination were explored. Results revealed that similar trends could be generally found, supporting the idea that more self-determined forms of motivation are related to a focus on private aspects of the self and that more nonself-determined forms of motivation are related to a focus on public aspects of the self. However, this finding was not consistent throughout all the contextual motivations. In light of the close conceptual and empirical connections between global and contextual forms

of self-determination, it was suggested that the relationship between forms of self-consciousness and self-determination may operate mostly at the global (dispositional) level, and that the findings of these exploratory analyses could be explained as contextual correlates of these trait associations. Future research relating to this idea would be interesting.

Study 2

Using a cross-sectional design, a second study was planned to investigate how global self-determination, private self-consciousness and public self-consciousness could predict intentions and goal content in the context of dieting and weight management. The contextual motivational orientation toward eating ("eating self-determination") was also included in this study, in view of its theoretical and empirical connections to all the variables in the hypothesized model. It was hypothesized that intentions to control body weight should be predicted positively by public self-consciousness and negatively by private self-consciousness, and that eating self-determination should positively predict intentions to control body weight. The differential effects of motivation and monitoring were hypothesized to be reflected mostly in weight goals orientations: a more intrinsic (versus extrinsic) orientation was expected to be predicted positively by both global and contextual forms of self-determination, as well as by private self-consciousness, as these constructs are all associated with more personal and interiorized aspects of the self. Conversely, weight goals orientation was expected to be predicted negatively by public self-consciousness as well as intentions to control body weight, two constructs that relate to a concern with more external aspects of the self.

Results generally supported the study's hypotheses. Findings from path analyses suggested direct and indirect effects of the hypothesized predictors on weight goals orientation, revealing a positive relationship with global self-determination and a negative relationship with public self-consciousness. However, private self-consciousness was not a significant direct predictor of weight goals orientation when accounting for all other variables. It was suggested that the effects of private self-consciousness may function through global self-determination, although this mediation was not explicitly tested in the current model. A marginally significant indirect effect of private self-consciousness was detected, operating through intentions to control body weight.

Study 2 also revealed that an alternative model in which weight goals orientation predicted intentions to control body weight was statistically tenable. It was argued, however, that the hypothesized model was conceptually more reasonable. Overall, the findings from Study 2 paralleled those from Study 1, suggesting close relationships between the regulation styles brought upon by global self-determination and private self-consciousness, and between the regulation styles brought upon by global nonself-determination and public self-consciousness.

Study 3

Study 3 was designed to extend the previous studies' findings from cross-sectional self-reported data to behaviours observed in a laboratory setting with an experimental design. More specifically, the goal of this study was to test the moderating effect of global self-determination on the relationship between private self-awareness and food intake for restrained eaters. It was hypothesized that private self-awareness, by facilitating internal narratives, should lead individuals to focus on their goals as dictated by their motivational

orientation. As such, an increase in private self-awareness for individuals with low levels of global self-determination should be beneficial for self-regulation as it should make their external goals more salient, in turn increasing the coherence between their behaviours and goals. In contrast, an increase in private self-awareness should have little impact on individuals with high levels of global self-determination as their regulation style is already constituted of coherent goals and behaviours; making them more salient should not significantly affect self-regulation. In support of these hypotheses, findings revealed that the private self-awareness manipulation was associated with a reduction of food intake for participants low in global self-determination, but had no effects for participants high in global self-determination. The findings of Study 3, while supporting the broad propositions of this thesis, also extended the results of studies one and two to the understanding of interactions between global self-determination and more situational styles of self-awareness.

Study 4

Study 4 aimed to answer some limitations of Study 3 and replicate its findings with regard to private self-awareness. It was also designed to investigate the moderating effect of global self-determination on the relationship between public self-awareness and food intake. In an effort to link the results to Study 2, individuals that reported high intentions to control their body weight (rather than restrained eaters) were invited to the laboratory. On one hand, findings pointed to a moderation effect, suggesting that the impact of a public increase of self-awareness was stronger for individuals with high versus low levels of global self-determination. This was consistent with the idea that individuals with low levels of global self-determination function with a regulation style that is focused on external standards and thus are less affected by increases in public self-awareness, although this manipulation also

had an effect on them by leading them to become more aware of their public image. It is noteworthy that these findings were detected while controlling for participants' levels of public and private self-consciousness. On the other hand, findings did not replicate the results of Study 3 with regard to private self-awareness. It was suggested earlier that a lack of statistical power may have caused this inconsistency. Alternatively, an explanation for this lack of replication may be found by examining participant selection. These explanations are discussed in detail in the next sections, which address some strengths and limitations in the findings from the current program of research.

Taken together, the results from the four studies carried out in the context of this thesis generally support the propositions that the organismic perspective of self-determination can supplement our understanding of self-regulation from a mechanistic approach. The current findings contribute to our knowledge of the interaction between self-monitoring and motivation as ingredients of self-regulation, and provide evidence of differential self-regulation styles. The next section addresses some implications stemming from the findings of this program of research, for self-regulation research and self-determination theory. To set the stage, the concordance and discrepancies of the described findings are reviewed and discussed.

Implications

Concordance and Discrepancies across the Program of Research

The several hypotheses tested across the four studies described in the present program of research have yielded interesting results. Most of these results are in concordance and provide a clear answer to the questions of this thesis. However, a few discrepancies are also noteworthy.

Self-determined motivation and the private self. Studies one through three have provided concordant evidence that a more self-determined motivational orientation may be associated with a more private style of self-monitoring. Studies one and two have suggested this through correlational analyses of private self-consciousness and global self-determination, two personal variables thought to operate at the dispositional level. In Study 3, a similar relationship was also implied by showing that increases in situational private self-awareness had little impact (i.e., with regard to food intake) on individuals with high levels of global self-determination, while having a higher impact on individuals with low levels of global self-determination.

There were some inconsistent findings with regard to monitoring the private self, however. For instance, in Study 2, private self-consciousness did not directly predict a more intrinsic weight goals orientation as was expected. It was only indirectly, and marginally, associated with this variable. The findings from this study seem to suggest that the effects of private self-consciousness are substantially influenced by controlling for global self-determination and public self-consciousness. More specifically, the effect size of the zero-order Pearson correlation was reduced to 0 when examined in the context of the SEM model. This proposition is further supported by the negative suppressions effects also found in that study. More specifically, the apparently positive association between private self-consciousness and intentions to control body weight was revealed to actually be negative when controlling for public self-consciousness. In the same vein, the apparent positive relationship between private self-consciousness and weight goals orientation was reduced to 0 when controlling for global self-determination and public self-consciousness. As a result, it could be hypothesized that these two variables account for all the predictive variance of

private self-consciousness. Future studies are however needed to test the prediction of more self-regulation correlates before this proposition can be verified. Nonetheless, the argument that a self-determined motivational orientation and a private style of self-consciousness are closely related has found strong support in this thesis.

Another noteworthy incongruence was found in Study 4, where the effect of private self-awareness on self-regulation was not detected and the moderation effect by global self-determination was not replicated. As suggested earlier, this could be a statistical power issue (Aguinis, 2004) and more replications of this experiment are needed to establish precise conclusions as to why no effect was detected in Study 4. One explanation why the public self-awareness effect was statistically significant even with low statistical power may be that it is a very overt and controlling effect, by contrast to a private self-awareness effect which may be more subtle. Alternatively, the private self-awareness manipulation may have been less effective.

Nonself-determined motivation and the public self. Studies one, two and four provided concordant evidence suggesting that more nonself-determined motivational orientations may be associated with a more public style of self-monitoring. The correlational analyses of studies one and two suggested that public self-consciousness and global self-determination were negatively related. In other words, there appears to be a consistent connection between nonself-determined motivation and public aspects of the self across these studies. Study 4 also provided evidence of this relationship, suggesting that increases in situational public self-awareness had a stronger impact on individuals with high levels of global self-determination, in contrast to individuals with low levels of global self-determination.

A question emerges from the findings: "Does a focus on public aspects of the self lead to successful self-regulation?" On one hand, Study 4 answers with the affirmative, by suggesting that situational increases of public self-awareness are associated with lower food intake, at least temporarily. This supports the mechanistic claim that increasing self-monitoring fosters effective self-regulation. On the other hand, Study 2 suggests that public self-consciousness predicts the adoption of more extrinsically oriented weight goals. From the SDT perspective, this may be related to negative consequences such as the endorsement of the thin ideal and poor eating self-regulation (Pelletier & Dion, 2007). A way to reconcile these inconsistencies may be to conceive monitoring the public self as effective in the short term to pressure people to pay attention to what they eat, as in the case of situational increments, but detrimental in the long term, as controlling ways to regulate eating behaviour have been shown to be ineffective in the long term (Pelletier & Dion, 2007; Pelletier et al, 2004). This proposition is explored in detail in the "Future Directions" section later in this discussion.

Findings from the laboratory. The two laboratory studies carried out in this research program were designed in similar ways. Both studies exposed participants to increases of self-awareness (private in one case, private/public in the other) while they were carrying out a task and exposed to tempting food. The task was exactly the same for both studies, and the food was similar in many ways (easily accessible, common, snack food that should be eaten with moderation). The results, however, revealed some discrepancies. Study 3 supported the hypothesis for private self-awareness but did not include a public self-awareness condition; Study 4 supported the hypothesis for public self-awareness, but did not replicate Study 3's

findings for private self-awareness. Several explanations can be explored to shed light on these discrepancies.

A particularly interesting possible explanation worth discussing pertains to participant selection. A close inspection of Figures 3 and 4 suggests that the control conditions in both studies may not be equivalent. In Study 3, results supported evidence that global self-determination was related to food intake in the control condition (but not when private self-awareness was increased, as expected). In Study 4, results suggested that there was no global self-determination effect in the control condition. In reality, these two laboratory scenarios may not be generalizing to the same type of population. In Study 3, participants were selected based on their drive for thinness (EDI, Garner et al., 1983) and reported being *preoccupied* with their weight and eating behaviours. They were thus considered as restrained eaters. In contrast, Study 4 did not use restrained eaters, but participants with intentions to control their body weight, thus who reported that it was *important* for them to control their weight. This subtle difference in attitudes may have had an impact on the compatibility of the two laboratory studies. To support this claim, there is empirical evidence that global self-determination is related to the drive for thinness to some extent (Pelletier & Dion, 2007), while the results from Study 2 of the present dissertation provided evidence that global self-determination was not related to intentions toward dieting. Accordingly, the self-regulatory demands of both studies may not have been equivalent, thus making comparisons between the two studies difficult. More research is needed to further explore this issue and is discussed in "Future Directions".

Overall, the results described above have important implications for future research as well as for the understanding of behavioural self-regulation. In spite of some inconsistent

or unanticipated results, the majority of findings support the propositions outlined in the program of research. They contribute to both self-regulation research and self-determination theory in many ways. These contributions are discussed in details next.

Self-Regulation Research

Research on self-regulation has suggested that four basic ingredients are necessary to achieve success: standards, monitoring, strength and motivation (Baumeister & Vohs, 2007). It is believed that all components are important, but that some may offset others.

Results from the present thesis support this latter claim. It would appear that in some cases, self-monitoring may be less necessary for self-regulation than motivation. Findings suggest that a focus on private aspects of the self and self-determined motivation serve a similar function but operate in different ways. In other words, while both serve the function of increasing coherence between behaviours and the self, the mechanisms through which they accomplish this function is different. On one hand, mechanistic principles suggest that one's locus of attention, when oriented toward private aspects of the self, fosters effective self-regulation by facilitating internal narratives and activating motivation. However the effect of this increase in conscious thought appears to depend on the motivational style that is being activated. On the other hand, self-determined motivation operates on organismic principles suggesting that the behaviour's locus of causality, when more autonomous, fosters effective self-regulation. The effects of self-determination on successful self-regulation appear to be maintained with or without conscious thought. The findings of the present thesis have suggested that global self-determination could account for the variance of outcomes explained by private self-consciousness and could moderate the effects of private self-awareness. This appears to provide more support for self-determination theory than control

theory in terms of self-regulation research. This contribution raises many questions and more studies are needed to establish whether or not one is more essential than the other. For instance, a test of the moderating effects of private self-consciousness (trait level) on situational increases of self-determined motivation (state level) needs to be carried out.

In a similar vein, findings suggest that a focus on public aspects of the self and self-determined motivation do not have a similar function: the public self serves the function of aligning behaviours with extrinsic norms and goals, while self-determination serves the opposite function. However, the findings of this thesis also suggest that both can be useful for self-regulation, to some extent. The implications of this latter finding warrant further discussion. Monitoring the public self operates on the same mechanistic principles as monitoring the private self, with the exception that one's locus of attention is oriented towards socially perceived aspects of the self. Accordingly, a focus on the public self should foster effective self-regulation *only* when the external standards support this orientation. When external standards are in conflict with the personal objectives of self-regulation, failure may be more likely. Hence, more research on this specific type of self-monitoring is needed. For instance, an increase of public self-awareness that brings salience to a standard that is counterproductive to self-regulation should be tested. Furthermore, it would be interesting to examine how this increase differentially affects individuals according to their levels of global self-determination.

The current thesis also provides interesting insights with regard to Baumesiter & Masicampo's (2010) arguments that conscious thought may foster more effective self-regulation by facilitating internal narratives and mentally simulating events. While it may be true that a conscious self-focus on private aspects of the self may facilitate the activation of

plans and personal motivations, the *content* of these plans and these motivations appears to be equally important. More specifically, this thesis has suggested that a behavioural regulation style based on a more intrinsic goal content and a more self-determined motivational orientation may be more effective than a style based on extrinsic goal content and nonself-determined motivation. Moreover, findings suggest that when one's regulation style is self-determined, conscious thought, as activated by private self-awareness, may not be as necessary compared to when one's regulation is nonself-determined.

Overall, this thesis has contributed to the advancement of research on the self-regulation of behaviour by providing evidence of the interaction of self-monitoring and self-determination on a number of levels. It also shows how an organismic perspective can supplement the mechanistic point of view for the interaction of these two ingredients much like it had for standards and strength. The present findings also have important implications for self-determination theory.

Self-Determination Theory

SDT suggest that goal-behaviour coherence is fostered by organismic integration. When motivation is self-determined, one is said to act in coherence with one's sense of self. When motivation is nonself-determined, one is said to act as directed by external standards and internal pressures.

The results from the current thesis generally support propositions from SDT. They provide more empirical evidence replicating traditional findings and they have implications for future directions of research. For instance, the relationship between global and eating self-determination found in Study 2 was consistent with Vallerand's (1997) hierarchical conceptualization of motivation and the association between the global and more contextual

levels. Study 2 also replicated previous findings with regard to the relationship between goal motives and goal content (Sheldon et al., 2004). Furthermore, results generally corroborate previous research on the importance of SDT for understanding successful regulation of eating behaviours (Pelletier & Dion, 2007; Pelletier et al, 2004).

Results on the whole suggested evidence in support of the proposition by Ryan and Deci (2006) that different motivational styles could be associated with different types of behavioural regulation (i.e., autonomous and heteronomous). More specifically, results from the current studies revealed that self-regulation processes may not be the same when global self-determination is high versus low, with regard to the use and importance of self-monitoring. The present results concerning self-determination and self-monitoring concur with the findings of Sharp (2008) with regard to self-determination and self-regulatory strength. They suggest that people's motivational styles may have an impact on *how* they pursue goals. This underlines the importance of the organismic integration process and the extent to which this organismic perspective can contribute to our understanding of psychological functioning in general.

In addition to contributing to the organismic integration theory component of SDT, these findings also have implications for its cognitive evaluation theory (CET) sub-theory. CET specifically addresses intrinsic motivation and how environmental variables (such as autonomy support and a feeling of personal competence) can impact people's natural tendency to do activities for their own sake. Findings from the current thesis provide empirical support suggesting that a situational manipulation of public self-awareness may be felt as controlling, thus thwarting intrinsic motivation. This corroborates propositions by SDT researchers that public self-awareness corresponds to a controlling style of self-

regulation (Deci & Ryan, 1985b; Plant & Ryan, 1985; Ryan, 1993). Accordingly, it is possible that public self-awareness, while temporarily helping self-regulation *in the moment*, also acted as a controlling factor for the regulation of eating behaviours and could have thwarted participants' feelings of intrinsic motivation. Could participants have experienced more self-regulatory failure outside the laboratory following this manipulation as a result of this controlling impact? Future research could strive to explore this idea by further investigating the possibly negative effects of public self-awareness.

Also in relation to CET, this thesis suggests that private style of self-focus, whether in a situation or disposition, has close ties to a self-determined motivational orientation. These findings corroborate propositions by SDT researchers with regard to the positive impact of being mindful for self-regulation and well-being (Brown & Ryan, 2003; Brown, Ryan, & Creswell, 2007). Although these researchers have defined mindfulness as a distinct concept from private self-awareness, the current findings suggest that both constructs may operate in similar ways, namely by fostering conscious thought of internal narratives and activating specific motivational systems. The extent to which mindfulness and private self-awareness truly differ, however, thus remains to be explored in detail.

In another vein, the current findings have interesting implications for the study of automaticity in the context of SDT. Previous research has suggested that some instances of self-regulation may be automatic, in the sense that through repetition, the process becomes effortless and fast, leading behaviours to be initiated without conscious intentionality (Bargh & Chartrand, 1999). Based on SDT, researchers have also suggested that individuals' motivational orientation may be subliminally activated by cues and primes (Lévesque & Pelletier, 2003; Radel, Sarrazin, & Pelletier, ; Ratelle, Baldwin, & Vallerand, 2005) More

specifically, it has been suggested that some aspects of autonomy-supportive environments may activate self-determined motivation outside of one's awareness, while some aspects of controlling environments may automatically activate nonself-determined motivation. Accordingly, conscious thought has been suggested to play an essential role in mitigating the negative effects of automatically activated nonself-determined motivation (Lévesque, Copeland, & Sutcliffe, 2008). The current findings, particularly with regard to private self-awareness, provide interesting insights regarding this proposition. On one hand, individuals with a global self-determined motivational orientation may have, over time, automatized behaviours that are coherent with their goals, thus suggesting that conscious thought and inner narratives should be of little use to them for effective self-regulation. On the other hand, individuals with a global nonself-determined motivational orientation may have, over time, automatized behaviours that are incoherent with their goals, and thus an increase in conscious thought should play an essential part in making their self-regulation more successful. How motivation is automatized may thus have an impact on how useful conscious thought may be for self-regulation. More research on the interaction of chronically activated motivations, situational primes, and self-awareness is needed to further our understanding of these unconscious processes.

While making interesting contributions to SDT, the current thesis did not provide a test for many of its postulates, leaving some questions unanswered. For instance, the use of global self-determination as an index did not allow for separate tests of the impact that each specific motivational style may have on self-regulation. Furthermore, it remains unclear how situational variations of self-determination could interact with self-monitoring in the context of self-regulation. Further research is needed to address these issues.

Applications

The overarching goal of self-regulation research is improve our knowledge of how to help people achieve their goals. Moreover, self-regulation failure has been depicted as "the major social pathology of present time" (p.3, Baumesiter et al., 1994). In this context, the present dissertation proposes several notable applications for its findings.

Dieting and Weight Management

Although the current research provides only a limited perspective of the correlates associated with successful dieting and weight management, such as the adoption of intrinsic weigh goals and food intake in the laboratory, it offers useful insight. For instance, based on previous research and control theory, one may believe that increases in self-monitoring are beneficial for successful weight management and that fostering self-consciousness is an efficient way to achieve goals. The current results support this idea while presenting a caveat. While a private form of self-consciousness appears useful, this research suggests that adopting a perspective of public self-consciousness over time may lead to the development of extrinsic weight goals, which in turn may be detrimental for weight management. Accordingly, instead of increasing self-monitoring strategies, interventions aimed at helping individuals manage their weight might strive to foster on another, possibly more important aspect, namely one's motivational orientation. The current research has shown that one's motivational orientation in general, and toward eating in particular, lead to the adoption of more intrinsic weight goals. The importance of global self-determination was further supported by the laboratory findings of Study 3. In sum, if one wishes to successfully manage one's weight and diet, it may be more effective to foster a more self-determined motivational orientation rather than self-monitoring, or at least in conjunction with self-

monitoring. SDT provides a detailed framework on organismic integration and how people can internalize behaviour (Deci & Ryan, 2002).

For Self-Regulation in General

The applications of the current thesis may also extend to more general instances of self-regulation. Although this proposition remains to be tested, it is conceptually apparent. The current findings underscore the importance of behaviour-goal coherence for successful self-regulation. They also suggest that various combinations of motivation and self-monitoring may lead to self-regulation success. For instance, when motivation for a self-regulatory activity is nonself-determined, a situation increase of private self-awareness may be beneficial. In contrast, when motivation for a self-regulatory activity is self-determined, there may be no need for self-monitoring. A situational increase in public self-awareness has been suggested to help successful self-regulation, but whether this help is beneficial in the long term remains to be studied.

Limitations

Despite the evident support for the major propositions elaborated in the current dissertation, noteworthy limitations deserve some discussion.

One obvious limitation of the present research is its restriction to a single domain of self-regulation. Although it had the advantage of promoting consistency throughout the thesis, it remains unclear if the current findings can generalize to other instances of behavioural self-regulation. Baumeister et al. (2007) have shown through a myriad of studies that self-regulation processes appeared to be somewhat generalizable from one domain to another. It is thus probable that the current findings will be replicable under different circumstances of self-regulation.

In spite of its obvious advantages, a drawback of using observed behavioural responses in the laboratory setting was the sacrifice of external validity in favour of internal validity. As such, this study may not account for a "real life" test of self-regulatory behaviours. More research in this area is needed to investigate how these findings could be replicated in more applied settings. Nonetheless, the current findings offer a significant contribution to our understanding of the specific mental and behavioural processes involved in self-regulation that would be hard to realize from natural observation studies.

Also in the vein of generalizability, the current studies have the limitation of sampling from student populations only (with the exception of one sample in Study 1's meta-analysis). This may have had repercussions at two levels. First, because the samples came from undergraduate students in psychology, the participants were predominantly females. The meta-analysis in Study 1 indicated that gender did not appear to significantly influence the relationships between global self-determination and forms of self-consciousness. However, only a few samples were used in this meta-analysis and a replication of this finding would be desirable. In addition, research in the context of eating behaviours has suggested that females may be more prone to body weight preoccupations than males (Polivy & Herman, 2004) and this may bias the current results. More research on this matter with regard to gender differences is warranted. A second issue with the use of a student population is whether or not the findings can be thought to generalize to a broader population. On many levels, it can be argued that the mind basic elements of self-regulatory functioning should be similar across the population, yet some socio-demographic factors may influence this functioning. As such, the generalizability of the current findings should be interpreted with a certain limit.

Two final issues are also worth discussing and are more in the lines of statistical limitations than methodological ones. First, the results of Study 4 may have been hindered by a lack of statistical power. Future studies should aim at replicating the analyses proposed in Study 4 with a larger sample to provide a satisfactory test of all possible interaction and main effects. Second, the global self-determination index was used throughout this research for its simplicity and ease of interpretation. However, it may be useful to investigate the interaction of self-monitoring and self-determination with regard to each type of motivational orientation. The current findings thus provide an interesting first glance at the overall relationship between the two constructs, but this relationship still remains to be decomposed in more detail.

These limits should not overshadow the innovative insights provided by the results of the four studies described previously. Overall, in spite of the above mentioned limitations, it is believed that the current program of research constitutes a notable contribution to the extant literature on self-monitoring, self-determination and behavioural self-regulation. It is apparent that more research is warranted to improve our understanding of these variables and their interaction. To this end, some suggestions for future research are offered next.

Future Directions

This general discussion has so far suggested a number of future directions that warrant exploration. These ideas are addressed in more specific details here.

Based on some of the findings reported in this thesis, the question of whether monitoring the public self is beneficial or not to self-regulation is a critically needed area of exploration. It has been suggested here that monitoring the public self may differ in its impact on self-regulation with regard to its sort term versus long term effects. To this end, a

longitudinal test of the same propositions outlined in this thesis would constitute a major contribution. Based on a prospective design, a number of avenues could explore these questions. For instance, daily fluctuations of public (and private) self-awareness could be assessed in conjunction with self-regulatory outcomes. For a more long-term analysis, orientations of public self-consciousness could be associated with self-regulation outcomes throughout a semester (i.e., in the case of undergraduate students) or followed-up for a certain number of years. It the same vein, it would be interesting to study the impact of manipulations of public (and private) self-awareness for a long period of time (e.g., in the context of interventions of "self-regulation training"). Regardless of the research avenue, however, the findings from this thesis strongly recommend that motivational variables be taken in consideration in any longitudinal design.

In connection with the previous suggestion, more research is needed to explore the interaction of the dispositional orientations of self-monitoring and self-determination. More specifically, the question of whether one could be a mediator of the other at the trait level remains to be addressed. In other words, can one's motivational orientation help *explain* one's tendency toward a specific form of self-consciousness, or is self-consciousness an antecedent to motivational orientation? While control theory does not offer any explanation on the origins of one's orientations of self-consciousness, SDT suggests a rationale based on the satisfaction of basic psychological needs. A longitudinal design could contribute to provide a true test of mediation for these factors and enrich our understanding of their intersection.

As mentioned previously, the current study offered evidence of the moderating effect of global self-determination on situational variations of self-awareness, but did not provide

any test of the alternative: the moderating effect of self-consciousness on situational variations of self-determination. Such an investigation might prove useful in the comparison of these two ingredients of self-regulation. For instance, if global self-determination is shown to moderate the effects of self-awareness while self-consciousness has no effect on the relationship between situational variations of self-determination and self-regulation, then this may provide evidence that self-determination is a better predictor of self-regulatory success than self-monitoring.

Another important research direction that needs to be explored deals specifically with the extension of the results reported in Study 4 with regard to public self-awareness. In that study, an increase of public self-awareness was found to be beneficial as it ostensibly paralleled participant's efforts to self-regulation. As an increase in public self-awareness is thought to drive individuals toward the external standard that is made salient, one wonders what would happen if that salient was counterproductive to self-regulation. In the case of the self-regulation of eating behaviours, this might be accomplished by replicating the design used in studies three and four, but increasing public self-awareness by having an evaluative audience that was also eating the tempting food. The interaction with one's motivational orientation would be interesting to study in this context.

A series of studies might also aim to improve the generalizability of the present findings. For instance, a natural observation of the self-monitoring and self-determination orientations of clients in a weight loss clinic in relation to weight loss success would provide a "real life" test of the propositions outlined in this thesis. In addition, future research should strive to explore other self-regulation domains, as well as the interaction between self-monitoring and more contextual forms of motivation. Finally, more research on the effects of

gender differences with regard to the interaction of self-monitoring and self-determination in different contexts would improve the generalizability of the current findings.

Conclusion

In closing, it is hoped that the current research will stimulate more ideas on how we can help people become better "self-regulators". The current findings add to the already growing organismic perspective of self-regulation, which seems to suggest that when behavioural regulation is truly carried out by the self, little other ingredient such as strength or monitoring is required. Rather than focusing our efforts on these mechanistic concepts borrowed from the muscle and the cybernetic, we might instead focus on how we can help people find a more coherent sense of self, in line with their organismic nature. This more coherent sense of self may help transform what is actually *nonself*-regulation into a true form of *self*-regulation.

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APPENDIX A

PRIMARY MEASURES USED IN STUDY 2

1. GLOBAL MOTIVATION SCALE

Using the scale below, please indicate the extent to which each of the following statement corresponds to your reasons for doing things in life, in general.

Does not *correspond* at all	Corresponds *very little*	Corresponds *slightly*	Corresponds *moderately*	Corresponds *well*	Corresponds *very well*	Corresponds *exactly*
1	2	3	4	5	6	7

In general, I do things...

1. in order to help myself become the person I aim to be.	1	2	3	4	5	6	7
2. because I like making interesting discoveries.	1	2	3	4	5	6	7
3. because I want to be viewed more positively by certain people.	1	2	3	4	5	6	7
4. because I choose them as means to attain my objectives.	1	2	3	4	5	6	7
5. for the pleasure of acquiring new knowledge.	1	2	3	4	5	6	7
6. because otherwise I would feel guilty for not doing them.	1	2	3	4	5	6	7
7. because by doing them I am living in line with my deepest principles.	1	2	3	4	5	6	7
8. although it does not make a difference whether I do them or not.	1	2	3	4	5	6	7
9. for the pleasant sensations I feel while doing them.	1	2	3	4	5	6	7
10. in order to show others what I am capable of.	1	2	3	4	5	6	7
11. because I chose them in order to attain what I desire.	1	2	3	4	5	6	7
12. because I would beat myself up for not doing them.	1	2	3	4	5	6	7
13. even though I do not have a good reason for doing them.	1	2	3	4	5	6	7
14. in order to attain prestige.	1	2	3	4	5	6	7
15. even though I believe they are not worth the trouble.	1	2	3	4	5	6	7
16. because I would feel bad if I did not do them.	1	2	3	4	5	6	7
17. because by doing them I am fully expressing my deepest values.	1	2	3	4	5	6	7
18. because they reflect what I value the most in life.	1	2	3	4	5	6	7

2. SELF-CONSCIOUSNESS SCALE

Please indicate to which degree the following characteristics or descriptions apply to you.

Not at all like me	A little like me	Somewhat like me	Exactly like me
1	2	3	4

1. I'm always trying to figure myself out.	1	2	3	4
2. I'm concerned about my style of doing things.	1	2	3	4
3. It takes me time to get over my shyness in new situations.	1	2	3	4
4. I think about myself a lot.	1	2	3	4
5. I care a lot about how I present myself to others.	1	2	3	4
6. I often daydream about myself.	1	2	3	4
7. It's hard for me to work when someone is watching me.	1	2	3	4
8. I never take a hard look at myself.	1	2	3	4
9. I get embarrassed very easily.	1	2	3	4
10. I'm self-conscious about the way I look.	1	2	3	4
11. It's easy for me to talk to strangers.	1	2	3	4
12. I generally pay attention to my inner feelings.	1	2	3	4
13. I usually worry about making a good impression.	1	2	3	4
14. I'm constantly thinking about my reasons for doing things.	1	2	3	4
15. I feel nervous when I speak in front of a group.	1	2	3	4
16. Before I leave my house, I check how I look.	1	2	3	4
17. I sometimes step back (in my mind) in order to examine myself from a distance.	1	2	3	4
18. I'm concerned about what other people think of me.	1	2	3	4
19. I'm quick to notice changes in my mood.	1	2	3	4
20. I'm usually aware of my appearance.	1	2	3	4
21. I know the way my mind works when I work through a problem.	1	2	3	4
22. Large groups make me nervous.	1	2	3	4

3. Regulation of Eating Behaviors Scale

WHY DO YOU REGULATE WHAT YOU EAT?

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 1	Corresponds very little 2	Corresponds slightly 3	Corresponds moderately 4	Corresponds well 5	Corresponds very well 6	Corresponds exactly 7

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 (fits in well) with other aspects of my life.	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

4. Intentions to Control Body Weight

How important is it for you to control your body weight? (i.e., to lose weight or to engage in efforts to maintain your current weight)

Not important at all	Unimportant	Of little importance	Moderately important	Important	Very important	Extremely important
1	2	3	4	5	6	7

5. Weight Goals Orientation (Based on the Aspirations Index; Kasser & Ryan, 1996)

The following statements enumerate various GOALS you might have with weight management. Please indicate the extent to which you find each one important with regards to weight.

When thinking of controlling your weight, how important are these goals to you:

Not important at all 1	2	3	Moderately important 4	5	6	Extremely important 7
1. be beautiful				1	2	3	4	5	6	7
2. grow and learn new things				1	2	3	4	5	6	7
3. have my name known by many people				1	2	3	4	5	6	7
4. successfully hide the signs of aging				1	2	3	4	5	6	7
5. be physically healthy				1	2	3	4	5	6	7
6. be admired by many people				1	2	3	4	5	6	7
7. have people comment often about how attractive I look				1	2	3	4	5	6	7
8. feel good about my body				1	2	3	4	5	6	7
9. keep up with clothing fashions				1	2	3	4	5	6	7
10. keep myself healthy and well				1	2	3	4	5	6	7
11. achieve the look I've been after				1	2	3	4	5	6	7
12. be free from sickness				1	2	3	4	5	6	7
13. have an image that other find appealing				1	2	3	4	5	6	7
14. have a healthy lifestyle				1	2	3	4	5	6	7

APPENDIX B

PRIMARY MEASURES USED IN STUDY 3

1. PARTICIPANT SELECTION (FROM EATING DISORDERS INVENTORY; GARNER, OLMSTED, & POLIVY, 1983)

Never	Rarely	Sometimes	Often	Very Often	Always
1	2	3	4	5	6

I think about dieting	1	2	3	4	5	6
I am terrified of gaining weight	1	2	3	4	5	6
I am preoccupied with the desire to be thinner	1	2	3	4	5	6

2. POST-MANIPULATION QUESTIONS

I do not agree at all			I agree moderately			I agree completely
1	2	3	4	5	6	7

I felt the experimenter was honest and truthful with me in describing the study.	1	2	3	4	5	6	7

Below are statements that deal with some thoughts and feelings you may have had during the experiment. Please indicate to what extent you agree with each statement.

I felt aware of my thoughts and feelings during the task	1	2	3	4	5	6	7
During the task, I was quick to notice changes in my mood	1	2	3	4	5	6	7

APPENDIX C

PRIMARY MEASURES USED IN STUDY 4

1. PARTICIPANT SELECTION

How important is it for you to control your body weight? (i.e., to lose weight or to engage in efforts to maintain your current weight)

Not important at all	Unimportant	Of little importance	Moderately important	Important	Very important	Extremely important
1	2	3	4	5	6	7

2. PRE-MANIPULATION

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

I am hungry.	1	2	3	4	5	6	7

2. POST-MANIPULATION

Feelings about the task

Below are statements that deal with some thoughts and feelings you may have had during the experiment. Please indicate to what extent you agree with each statement.

I do not agree at all			I agree moderately			I agree completely
1	**2**	**3**	**4**	**5**	**6**	**7**

During the task…

I generally paid attention to my inner feelings	1	2	3	4	5	6	7
I felt more conscious of my physical appearance	1	2	3	4	5	6	7
I was concerned about what other people could think of me	1	2	3	4	5	6	7

I felt the experimenter was honest with me in describing the study	1	2	3	4	5	6	7