

# Why we eat what we eat: the role of autonomous motivation in eating behaviour regulation

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## Summary

This paper addresses the issue of the self-regulation of eating from two different perspectives. One is strongly based on social cognitive theories, whereby it primarily emphasises functional and executive aspects of behaviour change, broadly named *self-regulatory skills*. The other assumes that humans are active and self-directed organisms and emphasises particular psychological processes associated with optimal functioning, with a special emphasis on motivation and perceived autonomy. Although these perspectives clearly do not represent opposing approaches, this article attempts to illustrate how they differ when applied to promoting health behaviour self-regulation, highlighting some implications for patient counselling. Primarily, this article demonstrates that motivation *quality* plays a central role in the capacity to adopt and, more importantly, to sustain healthful diets. Furthermore, it is asserted that health professionals can create more or less conducive environments to elicit patients' *autonomous* motivation. Long-lasting self-motivation is also described here as being closely aligned with the qualitative elements of motivation, namely the degree to which people perceive a sense of choice, find well-grounded meaning and feel volitional (*i.e.* make a conscious decision or choice) in their pursuits. Thus, interventions that include the essential elements of promoting a person's sense of 'ownership' over their eating routines, deeply valuing and identifying with the goals associated with eating choices, and displaying genuine interest in the *experiences* associated with selecting and preparing meals are most likely to succeed in the long-term. This paper presents empirical evidence that supports these propositions and suggests some resources for health professionals who may wish to explore these concepts further. Moving forward, it is hoped that readers may feel (volitionally!) engaged in exploring some of these ideas in future work, particularly when attempting to support patients and clients towards the successful self-regulation of their eating habits, their weight, and ultimately their health.

**Keywords:** autonomy, eating regulation, motivation, self-determination, self-regulation, weight management

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## The challenge of (eating) self-regulation

Over the past century, life expectancy has increased by an average of 30 years in the developed world. Although historically medical and public health efforts have focused on the length of life, increased health-care costs associated with improved longevity and so-called 'lifestyle diseases' place growing pressure on individuals to assume a more active role in managing their health and improving their quality of life. Whereas before people were called upon to *comply* or *adhere* to medical advice, current public health recommendations focus on disease *self-management* and on *self-regulation*, given that most chronic diseases are strongly influenced by voluntary health behaviours (Maes & Karoly 2005). Eating regulation is one such domain in which individuals can positively influence their own health and wellbeing, choosing diets based on nutritional recommendations for both content (*e.g.* favouring low energy density meals) and pattern (*e.g.* eating breakfast daily). Unfortunately, in the current environment, many people find it very difficult to successfully regulate eating behaviours in the long-term, thus contributing to the current high rates of obesity, type 2 diabetes and other chronic conditions.

Regulating eating behaviour is a very complex task, simultaneously influenced by physiology (*e.g.* appetite and satiety signalling), acquired preferences, norms, habits and environmental aspects such as food price, access, or exposure to advertising. Despite these competing forces that often work against eating regulation, understanding how a person *chooses to eat* and the psychological processes involved in implementing one's intentions are central in the quest to promote more mindful eating regulation. Here two ways of approaching individual-level eating self-regulation are discussed. One focuses on the functional and executive aspects of eating behaviours (the 'how to'), while the other addresses the underlying nature of motivation, including issues of purpose and volition (the 'why'). We propose that an excessive focus on one of these aspects, to the detriment of the other, may not bring about change (*e.g.* for lack of competency) or result in change that is unstable and short-lived (*e.g.* for lack of lasting meaning and value).

## Self-regulation as self-control

Self-regulation is an important personality process by which people seek to exert control over their thoughts, their feelings, their impulses and appetites, and their task performances. (Baumeister *et al.* 2006, p. 1773).

Current interventions aimed at improving eating regulation, such as those found in many weight-control programmes, appear to be based on two key principles: they rely heavily on a *self-control model* of human self-regulation (Baumeister *et al.* 2006), and they are primarily focused on immediate behaviour change, not on its integration into a person's day-to-day behaviour and long-term habits. In these programmes, goals such as restricting the intake of certain foods or adopting specific cooking patterns (*e.g.* low-fat meals) are selected essentially for their direct utility or expected benefits, such as weight loss. Additionally, emphasis is often placed on training participants in a number of techniques or *self-regulatory skills*, such as self-monitoring, stimulus control and contingency management, to support behaviour change (*e.g.* Wing *et al.* 2006; Gokee-Larose *et al.* 2009). Other cognitive-behavioural strategies such as forming implementation intentions (*i.e.* identifying a specific time or means by which a goal pursuit begins), mental contrasting (*i.e.* comparing present reality to a desired future) or action planning (*i.e.* making specific plans about how and when a goal will be implemented) have also been used to promote health behaviours (Stadler *et al.* 2009; Conner *et al.* 2010). More broadly, increasing self-confidence through verbal persuasion (*e.g.* convincing someone about the importance of adopting a goal) or modelling (*e.g.* demonstrating how various aspects of a goal could be implemented, often with real-life examples), facilitating information processing of mental tasks (*e.g.* increasing knowledge), and having clear and behaviour-contingent incentives (*e.g.* meeting weekly calorie intake goals) are also hallmarks of this general approach towards self-regulation (Bandura 2005; Baumeister *et al.* 2006).

Another defining feature of current behavioural interventions is that little attention is devoted to the psychological resources needed for long-term maintenance (*e.g.* sustained motivation, support for psychological needs) after some degree of behaviour change has been initiated. The motivation offered by incentives (*e.g.* weight reduction, external praise, improved self-esteem) often fades over time and in the absence of continued professional support, people tend to return to baseline behaviour patterns. Skills learned in the context of these interventions, such as how to self-monitor or set appropriate goals, are most likely remembered over time. Consequently, many researchers are turning to other factors that might explain the stark increase in behavioural attrition to long-term eating regulation, including a more in-depth analysis of the role of motivation in eating regulation (H. Patrick *et al.*, submitted manuscript; P. J. Teixeira *et al.*, submitted manuscript). In

fact, notably absent from many contemporary interventions (e.g. Powell *et al.* 2007) are principles and strategies (indeed, a theory) compatible with promoting long-lasting *self-motivation* for health behaviours. Questions such as *why* one should persist with new routines (especially when immediate incentives have ended) and *in what ways* the new lifestyle serves a person's broader goals and needs are often either minimally addressed or not addressed at all. Lifestyle change is a very personal and individual affair. Thus, people's life goals, their values, and even their needs for fulfilling their individual potential and developing a sense of self that is coherent and well integrated may need to be considered more actively in the behaviour change equation, especially when long-lasting change is the target.

Some examples of how eating self-regulation can be measured from a self-control perspective include the degree to which a person consciously restricts food intake to meet a certain caloric goal (*i.e.* the level of *cognitive restraint* employed) and the level of self-confidence to resist relapse and sustain one's diet plan in the face of challenging situations (*i.e.* *self-efficacy*). Interestingly, although cognitive restraint and eating self-efficacy are considered consistent predictors of weight control (Elfhag & Rossner 2005), both have been shown to correlate with short-term weight loss considerably better than with long-term weight loss maintenance (Linde *et al.* 2006; Teixeira *et al.* 2006, 2010). A similar pattern of association was recently observed in a meta-analysis of 34 interventions employing self-regulatory strategies for weight control in diabetic patients (Huisman *et al.* 2009). Given these data, perspectives on self-regulation that consider sustainable motivational sources and the role of personal values and needs may better elucidate the processes by which people transition from behaviour change initiation towards long-term maintenance.

### **Autonomous (self-)regulation and self-motivation**

When self-determined, people experience a sense of freedom to do what is interesting, personally important, and vitalizing ([www.selfdeterminationtheory.org](http://www.selfdeterminationtheory.org)).

As researchers and clinicians look for new ways to help individuals adopt and sustain healthier eating patterns, it is important to consider some limitations of the self-control approach described above. First, daily eating behaviour depends on numerous decisions, many of which may function at low levels of conscious awareness, thus bypassing higher-level deliberation and

control. Second, new eating behaviours may have little inherent value besides their contingent benefit (e.g. weight loss) and consequently no investment is made towards integrating them with other goals and values (e.g. improving nutrition and health for the entire family) or making them interesting experiences that are intrinsically motivating (e.g. enjoying eating together in a group, making meals special family time or creatively preparing healthy meals). Third, motivation itself is often considered merely in terms of amount (how much one has), to the detriment of more *qualitative* elements, many of which could influence motivation persistence. We believe that additional theoretical perspectives may be needed to complement the strengths of existing models of self-regulation. Building self-confidence and learning how to structure and implement the initial steps of a new behavioural course are certainly useful elements of successful interventions. The critical question, however, is how the psychological 'energy' that drives action (*i.e.* the motivation) can be maintained in the long-term. Self-control may not be the same as self-motivation. In turn, successful self-regulation may involve considering additional motivational resources along with using cognitive-behavioural techniques such as goal setting, self-monitoring, self-reinforcement (e.g. rewarding oneself for achieving all or part of a goal), etc. (Maes & Karoly 2005).

One approach increasingly used to understand and change health behaviour is based on strengthening people's sense of personal autonomy towards their newly adopted lifestyles (Ryan & Deci 2006). From this perspective, autonomy is defined as 'ownership' or accepting the regulation for change as truly one's own, where decisions are endorsed at a deep personal level and are congruent with all parts of the self. From this perspective, autonomy is not synonymous with independence; in fact, one can (very volitionally) choose to be dependent on others. People who act autonomously assume greater responsibility and feel accountable for their actions because they have personally endorsed their course. Examples of statements that reflect autonomous motivation might include: 'I chose (some behaviour) because it feels personally important to me to do so', 'I truly feel this is the best way to help myself', 'I do (some activity) for the pleasure of discovering and mastering it', 'I feel like I'm closer to myself when I'm involved in (this activity)', 'I feel that I *chose myself* every time I decide to (take some course of action)', 'this (course of action) nicely reflects what I value and who I am' or simply 'this (activity) really interests me and so I keep coming back'. Autonomously motivated behaviours are better maintained because they are either inherently enjoyable or are well internalized

into the person's behavioural repertoire and sense of self (Ryan *et al.* 2010).

Although individuals may have a natural tendency to progressively integrate less autonomously motivated behaviours, social environments and interventions can decisively promote (or thwart) the development of these more sustainable forms of motivation (Deci & Ryan 1985; Ryan & Deci 2000). For example, external incentives, especially when they are behaviour contingent (*e.g.* getting a reward such as a monetary bonus for achieving a particular weight-loss goal), tend to undermine the development of intrinsic motivation (Deci *et al.* 1999). Although external incentives may thwart intrinsic motivation, other characteristics of the social environment may facilitate intrinsic motivation. These include (1) providing a client or patient the opportunity to make her or his own choices about how to pursue her or his goals (*e.g.* 'you may want to keep a food diary so you know how much you are eating'); (2) limiting the use of pressure and control (*e.g.* avoiding deadlines, excessive 'surveillance' or threats); (3) creating optimally challenging contexts (*i.e.* tasks and goals that are sufficiently challenging but not overwhelmingly difficult); and (4) providing a warm and accepting interpersonal climate in which the client is accepted whether or not goals are achieved.

### Current research on autonomous motivation, eating behaviour and weight control

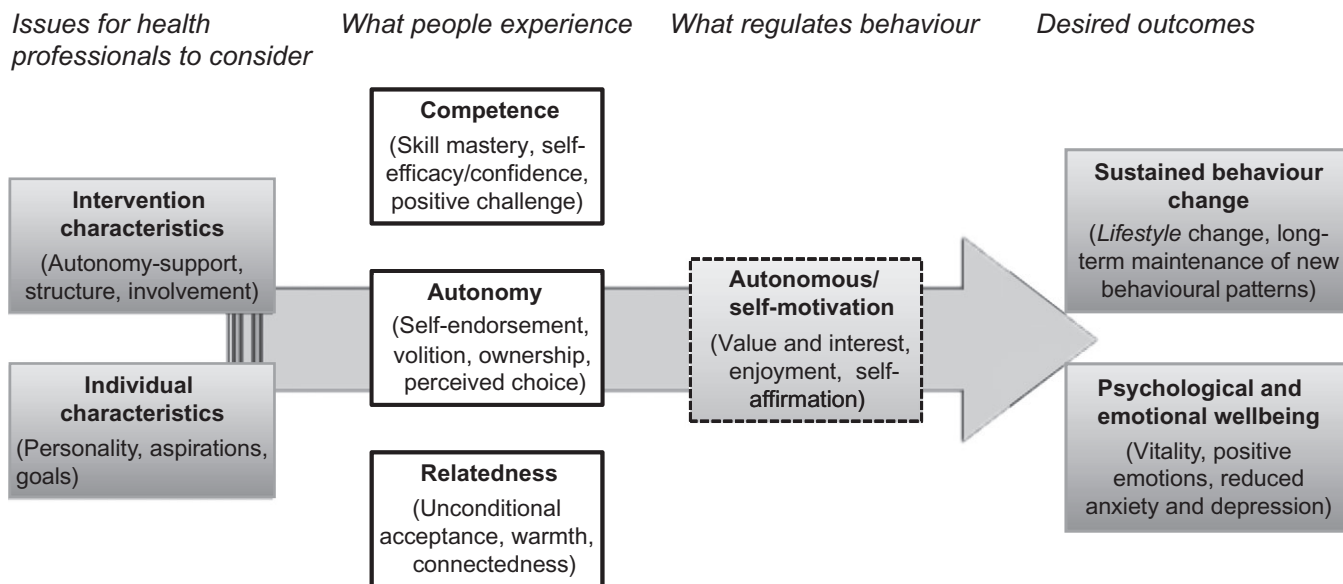
Self-determination theory provides empirically informed guidelines and principles for motivating people to explore experiences and events, and from that reflective basis, to make adaptive changes in goals, behaviours, and relationships (Ryan & Deci 2008).

Progress has been swift in testing the applicability of the principles described above, which are derived from self-determination theory (SDT), to the context of health behaviour change. For instance, autonomous motivation for eating has been cross-sectionally associated with healthier eating patterns (Pelletier *et al.* 2004; Pelletier & Dion 2007). In these studies, participants who reported higher scores on items like 'it is fun to create meals that are good for my health', 'eating healthy is part of the way I have chosen to live my life', 'eating healthy is congruent with other important aspects of my life' and 'eating healthy is a way to ensure long-term health benefits' were more likely to eat a significantly healthier diet, based on the Canadian Food Guide recommendations (eating more vegetables, fruits and grains; less fat, saturated fat and cholesterol; restricting foods such as chips, choco-

late, fried, white sugar). These findings are in agreement with a very consistent body of research indicating that long-term adoption of exercise and physical activity is also predicted by autonomous forms of motivation, such as intrinsic motivation (*e.g.* exercising because it is enjoyable or because it is consistent with other goals and values, such as a goal for improved health) (Hagger & Chatzisarantis 2008). Autonomous motivation is also commonly associated with improved psychological health and emotional wellbeing (Deci & Ryan 2008; Vieira *et al.* 2011). This is important for biomedical ethics but may also carry functional significance for individuals trying to initiate and maintain lifestyle change as it may additionally facilitate long-term self-regulation and behaviour change (Palmeira *et al.* 2009, 2010). Indeed, some authors view emotions at the centre of successful behavioural self-regulation (*e.g.* Kuhl *et al.* 2006). Figure 1 shows the general self-determination process model applied to lasting health behaviour change, including eating behaviour.

Experimental research is critical in testing how autonomy-promoting environments can be created in health-care settings and in evaluating the role of autonomous motivation as a potential *mediator* of behaviour change, including diet and weight control; in fact, longitudinal mediation studies provide the highest level of evidence for identifying the processes or *mechanisms* responsible for desired outcomes. Several randomised controlled trials have recently been completed targeting autonomous motivation for eating, physical activity and/or weight control (see M. S. Fortier *et al.*, submitted manuscript; P. J. Teixeira *et al.*, submitted manuscript). In one trial, nearly 250 overweight or obese women participated in a 1 year group-based weight control programme based on SDT (Silva *et al.* 2008, 2009). Results showed that autonomous motivation for physical activity at the end of the intervention mediated physical activity level at 2 years, which in turn mediated 3 years weight control (Silva *et al.* 2010, in press). At the 3 years follow-up, women who had initially received the SDT intervention reported almost 90 min per week more moderate and vigorous physical activity than the control women. Interestingly, autonomous motivation (for physical activity and for participating in treatment) also positively influenced a number of key eating behaviour variables such as emotional eating and eating self-efficacy, with potential cumulative effects on weight control (Mata *et al.* 2009; Andrade *et al.* 2010). More broadly, the application of SDT to understanding eating behaviour, from eating disorders to weight control, is a very promising area of research (H. Patrick *et al.*, submitted manuscript).





**Figure 1** Model for lasting health behaviour change and psychological wellbeing, based on self-determination theory.

## Conclusions

Health professionals, such as primary care physicians, dietitians and physical activity specialists, who are interested in adopting more autonomy-supportive practices may wish to follow some key guiding principles in their interaction with patients, some of which have been briefly addressed above [described in greater length elsewhere (*e.g.* Resnicow & McMaster, in press; Patrick & Williams, in press)]. For example, relying on the extensive use of rewards and incentives may not be compatible with a counselling approach that aims to promote patients' intrinsic motivation (Deci *et al.* 1999). Similarly, programmes that are based on continued external expert support (sometimes for years) or on the provision of prepared meals or supplements (*e.g.* Rock *et al.* 2010) may work well while they last but undermine the development of a participant's own motivational resources, which will likely be needed for lifetime self-management. Health professionals are also advised to seek out formal training opportunities where the principles and the practice of autonomy promotion are covered. Motivational interviewing is a formalised client-centred approach to counselling and eliciting behaviour change, which 'assumes, respects, and implicitly relies on volition to instigate self-regulation' (W. H. Miller & S. Rollnick, submitted manuscript). Despite their distinct origins (Vansteenkiste *et al.* in press), the ideas underlying motivational interviewing and its associated practical techniques are by and large compatible with SDT and with promoting autonomous motivation for change (Rollnick & Miller 1995; Markland *et al.*

2005). Both SDT and motivational interviewing have extensive resources available on their websites (<http://www.selfdeterminationtheory.org> and <http://www.motivationalinterviewing.org>).

## Conflict of interest

The authors have no conflict of interest to disclose.

## References

- Andrade AM, Coutinho SR, Silva MN *et al.* (2010) The effect of physical activity on weight loss is mediated by eating self-regulation. *Patient Education and Counseling* 79: 320–6.
- Bandura A (2005) The primacy of self-regulation in health promotion. *Applied Psychology: An International Review* 54: 245–54.
- Baumeister RF, Gailliot M, DeWall CN *et al.* (2006) Self-regulation and personality: how interventions increase regulatory success, and how depletion moderates the effects of traits on behavior. *Journal of Personality* 74: 1773–801.
- Conner M, Sandberg T & Norman P (2010) Using action planning to promote exercise behavior. *Annals of Behavioral Medicine: A Publication of the Society of Behavioral Medicine* 40: 65–76.
- Deci E & Ryan R (2008) Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology* 49: 14–23.
- Deci EL, Koestner R & Ryan RM (1999) A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin* 125: 627–68. Discussion 692–700.
- Deci EL & Ryan RM (1985) *Intrinsic Motivation and Self-Determination in Human Behavior*. Plenum Press: New York.
- Elfhag K & Rossner S (2005) Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss

- maintenance and weight regain. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity* 6: 67–85.
- Gokee-Larose J, Gorin AA & Wing RR (2009) Behavioral self-regulation for weight loss in young adults: a randomized controlled trial. *The International Journal of Behavioral Nutrition and Physical Activity* 6: 10.
- Hagger MS & Chatzisarantis NL (2008) Self-determination theory and the psychology of exercise. *International Review of Sport and Exercise Psychology* 1: 79–103.
- Huisman SD, De Gucht V, Dusseldorp E *et al.* (2009) The effect of weight reduction interventions for persons with type 2 diabetes: a meta-analysis from a self-regulation perspective. *The Diabetes Educator* 35: 818–35.
- Kuhl J, Kezén M & Koole SL (2006) Putting self-regulation theory into practice: a user's manual. *The Journal of Applied Psychology: An Internal Review* 55: 408–18.
- Linde JA, Rothman AJ, Baldwin AS *et al.* (2006) The impact of self-efficacy on behavior change and weight change among overweight participants in a weight loss trial. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association* 25: 282–91.
- Maes S & Karoly P (2005) Self-regulation assessment and intervention in physical health and illness: a review. *Applied Psychology* 54: 267–99.
- Markland D, Ryan R, Tobin V *et al.* (2005) Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology* 24: 811–31.
- Mata J, Silva MN, Vieira PN *et al.* (2009) Motivational 'spill-over' during weight control: increased self-determination and exercise intrinsic motivation predict eating self-regulation. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association* 28: 709–16.
- Palmeira AL, Markland DA, Silva MN *et al.* (2009) Reciprocal effects among changes in weight, body image, and other psychological factors during behavioral obesity treatment: a mediation analysis. *International Journal of Behavioral Nutrition and Physical Activity* 6: 9.
- Palmeira AL, Branco TL, Martins SC *et al.* (2010) Change in body image and psychological well-being during behavioral obesity treatment: associations with weight loss and maintenance. *Body Image* 7: 187–93.
- Patrick H & Williams GC (2011) Self-determination theory: its application to health behavior and complementarity with motivational interviewing. *International Journal of Behavioral Nutrition and Physical Activity* (in press).
- Pelletier LS, Dion S, Slovinec-D'Angelo M *et al.* (2004) Why do you regulate what you eat? Relationships between forms of regulation, eating behaviors, sustained dietary behavior change, and psychological adjustment. *Motivation Emotion* 28: 245–77.
- Pelletier LS & Dion SC (2007) An examination of general and specific motivational mechanisms for the relations between body dissatisfaction and eating behaviors. *Journal of Social and Clinical Psychology* 26: 303–33.
- Powell L, Calvin J III & Calvin J Jr. (2007) Effective obesity treatments. *American Psychologist* 62: 234–46.
- Resnicow K & McMaster F (2010) Motivational interviewing: moving from why to how with autonomy support. *International Journal of Behavioral Nutrition and Physical Activity* (in press).
- Rock CL, Flatt SW, Sherwood NE *et al.* (2010) Effect of a free prepared meal and incentivized weight loss program on weight loss and weight loss maintenance in obese and overweight women: a randomized controlled trial. *Journal of the American Medical Association* 304: 1857–8.
- Rollnick S & Miller W (1995) What is motivational interviewing? *Behavioural and Cognitive Psychotherapy* 23: 325–34.
- Ryan R & Deci E (2000) Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist* 55: 68–78.
- Ryan RM & Deci EL (2006) Self-regulation and the problem of human autonomy: does psychology need choice, self-determination, and will? *Journal of Personality* 74: 1557–85.
- Ryan RM & Deci EL (2008) A self-determination theory approach to psychotherapy: the motivational basis effective change. *Canadian Psychology* 49: 186–93.
- Ryan RM, Lynch MF, Vansteenkiste M *et al.* (2010) Motivation and autonomy in counseling, psychotherapy, and behavior change: a look at theory and practice. *The Counseling Psychologist* 32: 193–260.
- Silva MN, Markland D, Minderico CS *et al.* (2008) A randomized controlled trial to evaluate self-determination theory for exercise adherence and weight control: rationale and intervention description. *BMC Public Health* 8: 234.
- Silva MN, Markland D, Vieira P *et al.* (2010) Helping overweight women become more active: need support and motivational regulations for different forms of physical activity. *Psychology of Sport and Exercise* 11: 591–601.
- Silva MN, Vieira PN, Coutinho SR *et al.* (2010) Using self-determination theory to promote physical activity and weight control: a randomized controlled trial in women. *Journal of Behavioral Medicine* 33: 110–22.
- Silva MN, Markland D, Carraça E *et al.* (in press) Exercise autonomous motivation predicts 3-year weight loss in women. *Medicine and Science in Sports and Exercise*: DOI: 10.1249/MSS.06013e3181f3818f.
- Stadler G, Oettingen G & Gollwitzer PM (2009) Physical activity in women: effects of a self-regulation intervention. *American Journal of Preventive Medicine* 36: 29–34.
- Teixeira PJ, Going SB, Houtkooper LB *et al.* (2006) Exercise motivation, eating, and body image variables as predictors of weight control. *Medicine and Science in Sports and Exercise* 38: 179–88.
- Teixeira PJ, Silva MN, Coutinho SR *et al.* (2010) Mediators of weight loss and weight loss maintenance in middle-aged women. *Obesity (Silver Spring)* 18: 725–35.
- Vansteenkiste M, Resnicow K & Williams GW (in press) Toward systematic integration between self-determination theory and Motivational Interviewing as examples of top-down and bottom-up intervention development: autonomy or volition as a fundamental theoretical principle. *International Journal of Behavioral Nutrition and Physical Activity* (in press).
- Vieira PN, Mata J, Silva MN *et al.* (2011) Predictors of psychological well-being during behavioral obesity treatment in women. *Journal of Obesity*: DOI: 10.1155/2011/936153.
- Wing RR, Tate DF, Gorin AA *et al.* (2006) A self-regulation program for maintenance of weight loss. *The New England Journal of Medicine* 355: 1563–71.