



Research report

Improving compliance to meal-replacement food regimens. Forming implementation intentions (conscious IF-THEN plans) increases compliance[☆]

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ABSTRACT

Creating and changing habits around dieting behaviour can be a way to help consumers to consume more healthy products and to control their weight. Previous studies suggested that implementation intentions – deliberate plans on when, where and how – increase the likelihood that consumers perform the intended behaviour (Armitage, 2004; Gollwitzer & Sheeran, 2006; Jackson et al., 2005). This study investigated the effect of forming implementation intentions on compliance to a regimen based on a range of meal-replacement food products and snacks. Participants ($n = 57$) were allocated to one of two groups, either: (1) an implementation-intention group, who formed deliberate plans (implementation intentions) to consume the products – these implementation intentions were formed only once at the beginning of the study –, or (2) a control group who formed no implementation intentions. Participants were then instructed to follow a daily regimen, which included the consumption of foods from a range of meal-replacement products and snacks provided gratis for four weeks. Results showed that the implementation-intention group consumed significantly more meal-replacement food products per week ($p < 0.05$) and decreased their BMI score more than did the control group ($p < 0.05$). The effect of forming the implementation intentions was apparent for 18 days. These findings indicate that forming implementation intentions may assist individuals in their compliance to a meal-replacement product regimen.

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Introduction

The prevalence of obesity in both the United States and Europe has risen dramatically in recent years (CBS, 2007; CDC/NCHS NHANES, 2007). This is clearly a major concern, given the link between excess weight and cardiovascular disease, diabetes mellitus and certain cancers (Rashid, Fuentes, Touchon, & Wehner, 2003; Sicree & Shaw, 2007; Weiss et al., 2004). For some individuals, a possible strategy to treat these weight problems is the use of low-energy meal-replacement food products (hereafter called MR products). In the context of this paper, MR products include both those products designed to replace complete meals (e.g., meal bars, soups) as well as products that could also be used as snacks between meals (e.g., bars, shakes). MR products have repeatedly been shown to be effective for weight loss and long-term maintenance. Anderson, Luan, & Hoie (2004) showed in a

recent meta-analysis that different weight-loss approaches lead to different amounts of weight loss (and different associated health effects such as reductions in blood lipids and blood pressure). The use of two MR products per day and limited nutrition counselling was associated with an average weight loss of 9.1 percent of initial body weight. Other studies have shown that the accomplished weight loss is also sustainable for several years (Egger, 2006; Flechtner-Mors, Ditschuneit, Johnson, Suchard, & Adler, 2000; Noakes, Foster, Keogh, & Clifton, 2004; Rothacker, 2000).

However, although the use of MR products is considered effective, safe and acceptable as a proven weight-loss approach, consumers need to use such products on a regular basis in order to achieve their weight-loss goals (based on a healthy weight loss of 1 to 2 pounds per week). In other words, compliance to the MR products is critical to be effective and is recognized as perhaps the major determinant of weight-loss success, regardless of dieting approach that is taken (Heymsfield et al., 2007).

Creating habits around the consumption of MR products is one possible route to increasing compliance (Gollwitzer, 1999; Gollwitzer & Sheeran, 2006; Webb & Sheeran, 2006) and therefore facilitating weight loss. Habits can be defined as behaviours that are elicited automatically (Conner & Armitage, 2002). However, creating and changing habits is difficult. The Theory of Planned

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Behaviour (Ajzen, 1991) is often used to understand and predict consumer behaviours and habit formation. It proposes that consumers' intentions to perform a behaviour (e.g., to consume a MR product) are a strong predictor of actual behavioural performance (Ajzen, 1991; Fishbein & Ajzen, 1975).

However, evidence suggests that measures of intention typically account for only 25–30% of the variance in social and health behaviours (Sheeran, 2002; Sheeran & Orbell, 1999). There is a substantial "gap" of approximately 70% between consumers' intentions and their behaviours. Although the Theory of Planned Behaviour is clear about what motivates people (e.g., behavioural intentions), it is less clear about how motivation is translated into action. According to Gollwitzer (1993), motivation and intention to comply may be more likely to result in action if *implementation intentions* are formed. They can be defined as IF–THEN plans that connect anticipated situations with a certain goal-directed behaviour. The IF-component identifies a suitable situation in which to initiate the behaviour. The THEN-component of the plan identifies an effective goal-directed behaviour. Applied to the usage of MR products, an example of an implementation intention might be a deliberate plan to eat an MR product in a specific context with a specific cue in that context to trigger the consumption. For example, 'if it is 12 o'clock in the afternoon at home (context) and I feel hungry (cue), then I will eat my MR soup instead of my regular cheese sandwich (behaviour)'. Whereas a behavioural intention only indicates *what* one will do, an implementation intention goes further by specifying the *when*, *where* and *how* of what one will do. Specifying where and when one will carry out a particular behaviour leads to an 'automated action initiation' once the critical cue(s) is encountered. This, in turn, is said to encourage individual 'goal striving', protecting the ongoing goal pursuit from unwanted influences (Gollwitzer, 1993, 1999; Gollwitzer & Sheeran, 2006).

Research on the effects of implementation intentions on behaviour has shown that implementation intentions are effective in increasing various behaviours, such as completing a written report (Gollwitzer & Brandstatter, 1997), carrying out breast self-examination (Orbell, Hodgkins, & Sheeran, 1997), vitamin consumption (Sheeran & Orbell, 1999), attending cervical cancer screening (Sheeran & Orbell, 2000), purchasing organically produced food (Bamberg, 2002), recycling of drinking cartons (Rise, Thompson, & Verplanken, 2003) and engaging in physical activity (Luszczynska, 2006; Milne, Orbell, & Sheeran, 2002; Rise et al., 2003).

So far, only a few studies have explored the effect of implementation intentions on food consumption behaviours. For example, three studies showed that implementation intentions could help increase the intake of fruit and vegetables in adults (De Nooijer, De Vet, Brug, & De Vries, 2006; Kellar & Abraham, 2005) and children (Gratton, Povey, & Clark-Carter, 2007), whereas one study found no effect on fruit and vegetable intake (Jackson et al., 2005). In addition, four other studies found that implementation intentions significantly reduced dietary fat intake (Armitage, 2004, 2006; Luszczynska, Scholz, & Sutton, 2007) and increased healthy eating in general (Verplanken & Faes, 1999).

However, none of these studies has looked at compliance to MR food regimens. The aim of this study was to examine the effect of implementation intentions on compliance to a planned regimen involving the consumption of a range of MR products over 4 weeks. We hypothesised that forming implementation intentions would help MR product users to increase and/or sustain their compliance in usage of these products, and therefore lose weight. This study therefore tested whether making implementation intentions to eat MR products could (1) increase compliance to exclusive consumption of MR products and (2) augment weight-loss results.

Method

Participants

Subjects were 63 consumers recruited from a database of people who used a special website to register their interest in using MR products in the near future. These people were contacted via email and invited to participate in the study. Interested participants responded via return email and completed a screening questionnaire. Recruitment inclusion criteria were: having previously dieted with MR products, intending to lose weight in the near future, being willing to follow an eating regimen including these products again, and being mildly overweight to obese as defined by a BMI (kg/m^2) between 25 and 35. After screening and selection, subjects were randomised into two groups, the implementation-intention group and control group, and matched for gender, age and BMI. During the study, six subjects dropped out for personal reasons: their data were excluded from statistical analysis. Table 1 shows some characteristics of the remaining 57 subjects in the two groups. The study was approved by the Medical Ethical Committee of Wageningen University (NL).

Food products

A range of Slim-Fast branded MR products was used, including smoothies, shakes, soups, meal bars and snack bars. Participants bought the MR products themselves in locations convenient to them and the product costs were reimbursed on completion of the study.

Procedure and measures

Participants consumed a range of Slim-Fast branded MR products for a period of four weeks. Each participant was allowed to use one or more MR product at any time of the day and where they wanted (e.g., at home or at work). All participants were instructed to record their consumption of MR products in a diary for the 4-week study duration.

Participants were randomly assigned to one of two groups, either: (1) an implementation-intention group ($n = 26$), or (2) a control group ($n = 31$). The implementation-intention group made implementation intention(s), an activity conducted only once at the beginning of the study, i.e., they wrote down when, where and how they would use the MR product(s) throughout the day. The control group followed the same procedure as the implementation-intention group, except for the implementation intention. The implementation intention(s) consisted of:

- "If ..." – describe situation (location, time, and/or mood);
- "Then ..." – describe what to do (which product and the reason for using that specific product in that specific situation).

Participants returned their implementation-intention forms immediately after forming them. Participants made on average 5 implementation intentions each. For example:

Table 1

Subject characteristics classified per group (mean \pm SE; $n = 57$; BMI = Body Mass Index) at the start of the study.

	Control group	Implementation intention group
<i>n</i>	31	26
Sex (m/f)	7/24	5/21
Age (years)	35.2 \pm 1.9	41.6 \pm 2.9
Height (m)	171.0 \pm 1.3	169.6 \pm 1.4
Weight (kg)	79.6 \pm 2.1	78.1 \pm 2.1
BMI (kg/m^2)	27.2 \pm 0.5	27.1 \pm 0.6

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