Psychology and Health
August 2007; 22(6): 677–698

Routledge
Taylor & Francis Group

Does confrontation with potential goal failure promote self-regulation? Examining the role of distress in the pursuit of weight goals

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(Received 21 December 2005; in final form 12 September 2006)

Abstract
How do people maintain goal pursuit when confronted with the risk of failure? In two studies ($n = 62$ and $n = 49$), we investigated whether a threat of failure manipulation, either or not involving the self, would affect self-regulation in women who were concerned about their weight. We expected that potential goal failure would result in greater distress and influence strategies for goal pursuit and self-control. Study 1, involving normal weight women, found that self-relevant goal threat resulted in greater distress but that distress did not affect self-regulation. Study 2, involving both normal weight and overweight women, found similar results. However, women who were exposed to objective goal threat and at the same time received feedback that the self was not involved spent more time on planning strategies for goal pursuit and demonstrated higher self-control. It is concluded that information emphasizing both opportunities for goal achievement and the necessity to act is sufficient for engaging in self-regulation.

Keywords: *Self-regulation, self-control, emotional distress, goal failure, weight goals*

Introduction

Many studies assert that emotional distress may compromise self-regulatory behaviour (Leith & Baumeister, 1996; Tice, Bratslavsky, & Baumeister, 2001). The undermining role of distress in self-regulation has been explained in terms of the limited capacity for self-regulation (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven & Baumeister, 2000) or in terms of impaired motivation to continue striving for distal goals (Muraven & Slessareva, 2003). It appears that

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ISSN 0887-0446 print/ISSN 1476-8321 online © 2007 Taylor & Francis
DOI: 10.1080/14768320601020238

the majority of theories about the role of distress in self-regulation tend to emphasize its negative effects. By doing so, they may underestimate the possibility that some forms of emotional distress can also promote self-regulation. Evidence for the positive role of distress comes from the transactional theory of stress and coping, which highlights its role in creating 'action-preparedness' (Lazarus & Folkman, 1984). In this view, distress is a signal that something important to the person is threatened and promotes engagement in actions to protect these things. Although the majority of studies in this area have examined the way people react to distress, the activating role of distress has also been studied in the context of self-regulatory efforts to deal with potential threats to long-term goals (labelled as 'proactive coping'; Aspinwall & Taylor, 1997). Self-regulatory models like control theory (Carver & Scheier, 1982) and regulatory focus theory (Higgins, 1997) also emphasize the role of distress as a sign for action in terms of discrepancies between current and desired states. The aim of the present study is to further examine the role of distress in self-regulation by considering one particular form of distress – that is, distress as a result of learning that a personally important health goal (weight loss) may be difficult to achieve. Our main hypothesis states that potential goal failure creates distress, which in turn may affect attempts for self-regulation. We will first elaborate on the relationship between distress and self-regulation. Next, we will discuss to what extent potential goal failure is related to distress and self-regulation.

Self-control and long-term striving

A large body of literature has examined the effects of distress on self-regulation. In evaluating these effects, it is important to distinguish between different aspects of self-regulation. Although some studies equate self-control and self-regulation (e.g., Muraven & Baumeister, 2000), self-regulation consists of at least two components: self-control and processes related to goal striving. Self-control involves the inhibition of immediate impulses in the service of a future goal that is often associated with greater rewards, whereas goal-striving refers to processes such as determining or planning one's strategies for goal pursuit (Mischel, Cantor, & Feldman, 1996). In particular, planning or the ability to foresee which strategies are required for achieving one's goal is considered to be an essential element of the so-called 'planful' component of self-regulation (e.g., Carver, 2004). Two opposing views exist about the way self-control and goal striving are related. One theory is the limited capacity model, which emphasizes that self-regulation requires the exercise of self-control in the service of long-term goal striving. In this view, self-control involves the inhibition of urges or desires that would otherwise interfere with goal-directed behaviour (Baumeister et al., 1998). As the capacity for self-control is limited, goal striving may be compromised when people employ self-control for resisting temptation, leaving the individual depleted of resources that are required for long-term goal pursuit. The limited capacity model offers a good explanation of self-regulatory failure but makes it difficult to understand how people might successfully manage the potentially

competing demands of dealing with immediate temptations and long-term goal striving. As people rarely have the luxury of attending to their long-term goal only and are repeatedly confronted with distractions and frustrations during the process of goal striving, it seems plausible that immediate needs and long-term goals are not necessarily competitive but also may be mutually facilitative.

A second model of the relation between self-control and goal striving emphasizes these facilitative links and argues that dealing with frustrations and temptations is inherent in the pursuit of long-term goals (Brandtstädter & Renner, 1990; Mischel et al., 1996). According to this view, the stoic denial of frustrations and temptations does not necessarily benefit effective goal striving. In contrast, it is argued that momentary allurements may remind people of their long-term goals (Fishbach, Friedman, & Kruglanski, 2003; Trope & Fishbach, 2000) and make these goals more salient (Metcalfe & Mischel, 1999). In turn, salient goals are supposed to promote efforts for continued goal-striving.

These opposing views on the role of immediate temptations and consequently on the role of self-control in self-regulation have important consequences for understanding the role of distress in self-regulation. In the limited capacity model, distress is regarded to increase the competitive demands of immediate temptations and striving for goals and thus the main cause of self-regulatory failure. In contrast, in the facilitative model, some amount of distress is believed to strengthen the link between immediate demands and long-term strivings. This implies that (mild) forms of distress that are related to the goal one is striving for may make goals more salient and thus increase attempts for achieving the goal – for example, by premeditating one's plans for action (Carver, 2004). In the next section, we will examine how distress affects both components of self-regulation in the eating domain.

Distress and self-regulation in the eating domain

Failures to inhibit one's urges have especially been reported in the eating domain, and emotional distress is regarded a major cause of decreased attempts for controlling food intake in restrained eaters who have adopted a pattern of intentional dietary restriction (Cools, Schotte, & McNally, 1992; Greeno & Wing, 1994). Whereas normal eaters tend to consume less during distress, restrained eaters are reported to overeat when emotionally upset. In many cases, a reciprocal pattern of escalating effects develops, in which distress causes eating, which leads to more distress as the person reflects on their dietary breakdown, which in turn triggers more eating (Heatherton, Striepe, & Wittenberg, 1998; Wallis & Hetheringon, 2004). Heatherton and Baumeister (1991) put forward escape theory to explain why people who are concerned about their diet overeat in the face of stressful situations, proposing that overeating is a motivated attempt to escape emotional distress. Consistent with this argument, it has been reported that failures to inhibit eating impulses are related to personally relevant stressors that impose a threat to the self. This type of ego-related distress has a stronger impact than non-personalized stress (Heatherton, Herman, & Polivy, 1991;

Heatherton et al., 1998). Thus, it seems that emotional distress that threatens the self compromises self-control when a personally important goal (dieting) is at stake. However, these studies have not examined how emotional distress that is typically linked to long-term goals affects self-regulation.

Studies that examine the facilitative link between goal-related distress and self-regulatory efforts are rare. Generally, these studies show that anticipation of failure to achieve a personally important goal creates distress and affects efforts for continued goal-striving (Grant & Dweck, 2003; Kaiser & Ozer, 1997; Pham, Taylor, & Seeman, 2001). In a series of experiments, Trope and Fishbach (2000) demonstrated that people who were confronted with the short-term costs that their long-term plans required, and thus likely to experience some kind of goal-related distress, were more prepared to exercise self-control (i.e., withstand immediate temptation). These effects were more pronounced when the long-term goal was more important. When people were made aware of the threats to their long-term goals posed by immediate temptation, counteractive control strategies were employed to offset the influence of temptations on their self-regulatory behaviour. In a subsequent number of experiments, Fishbach and colleagues (2003) replicated these findings in the dieting domain. They showed that priming women who were concerned about their weight to fattening foods reminded them of their diet goals and actually helped them make stronger dieting intentions as compared with women in a control group (Fishbach et al., 2003; Study 5). It seems that priming to forbidden foods, which is a probable cause of emotional distress in women who want to diet, made their goal more salient and helped them to withstand the immediate temptation of food. Taken together, these findings give credit to the counterintuitive idea that distress related to the specific goals that people find important may harness long-term striving and self-control.

The present investigation

The central idea of the present investigation is that confrontation with possible failure to achieve a personally important goal causes distress that is specifically linked to the goal. We assume that this type of distress (resulting from learning that attempts for goal attainment may fail) increases efforts to attain the goal (including determining strategies for goal attainment) and resist temptations that impose a threat for goal attainment. By examining the effects of failure-related distress on (making plans for) goal striving and resisting temptation, we distinguish between two types of potential goal failure, failure related to non-personal factors (objective goal threat) and failure related to personal factors (self-relevant goal threat).[1] Previous studies have demonstrated that self-relevant threat is more likely to affect self-control than threats that do not involve the self (Heatherton et al., 1991, 1998). However, the types of threat in these studies were unrelated to the goals individuals had adopted. In addition, these studies did not address the joint effects of objective threat and self-relevant threat. Consistent with previous findings, we hypothesize that self-relevant threat is related to higher levels of distress than objective threat. However, the mere experience of

self-relevant threat may not be sufficient to act upon a goal. We believe that particular combinations of both types of potential goal failure are more or less likely to affect self-regulation. When both types of threat are low it is unlikely that people will experience effects on self-control or long-term goal striving. In a similar vein, when both types of threat are high the risk of failure may become so overwhelming that there is no point in making attempts for goal achievement or exercising self-control. But what happens when a person learns that a goal might be difficult to achieve but that she is capable of making the effort or when she knows that a goal is relatively easy to attain but requires a major personal investment? We believe that these discrepancies between objective goal threat and self-relevant goal threat are particularly motivating to engage in self-regulatory efforts as they may create a sense of urgency to act upon the goal. In sum, this study aims to test two hypotheses. First, we hypothesize that potential goal failure leads to distress and engagement in self-regulatory effort. Moreover, we assume that the experience of distress mediates the effect of potential goal failure on self-regulation. Second, discriminating between two types of potential goal failure, we hypothesize that discrepancies between these two types of information is more likely to affect self-regulatory effort than congruent combinations.

Overview of the studies

We examined these hypotheses in two studies among women who were concerned about their weight. Both studies adopted the same bogus feedback procedure of informing women whether or not weight loss was a realistic goal (objective goal threat) and whether or not they would be able to afford the personal effort required for goal striving (self-relevant goal threat). The effects of this feedback procedure were assessed by examining the level of distress in terms of negative affect (Study 1) or in types of emotional distress (Study 2). The main dependent measures were the time spent on determining strategies for goal attainment as a measure of goal striving (both studies) and consumption of cookies as a measure of self-control either in the presence of the experimenter (Study 1) or without her presence (Study 2). Participants were either normal weight (Study 1) or normal weight and overweight (Study 2).

Study 1

Participants

A total of 65 female undergraduates who were concerned about their weight were recruited to participate in a study that was presented as examining the role of lifestyle in attempts to maintain or lose weight. Participants received 3€ for participation. One participant who wanted to gain weight as well as 2 participants who were obese were excluded (BMI > 30). Mean age of the final sample ($N = 62$) was 21.7 years (SD = 4.3). Most participants (87%) wanted to lose weight ($M = 3.6$ kg, SD = 2.36) whereas 13% wanted to maintain their

current weight. All participants had normal weight ($18 < \text{BMI} < 25$; $M = 21.44$, $\text{SD} = 1.72$).

Procedure and design

Participants were invited to the laboratory and examined individually. They were seated behind a computer and first answered questions about their age, length, weight, target weight, and whether or not they had eaten any food in the past 2 h, and completed the control measures (see 'Measures' section for details). Subsequently, participants were primed on their weight goal by having them think (for 1 min) about the pleasures of maintaining or losing weight. They then filled out the bogus Lifestyle and Health Knowledge Test (LHKT) with 25 questions about healthy lifestyle (e.g., 'Do you have breakfast every day?') and 20 questions about nutritional habits derived from a healthy food quiz developed by the Dutch Institute for Nutrition (e.g., '100 g of meat satisfies your daily nutritional requirements'). Items were designed in such a way that participants could not easily determine whether they had healthy or unhealthy habits. The LHKT, designed for the purpose of this study, was presented as a valid measure to assess health habits. Feedback was provided through information on the computer screen after 25,000 ms during which the program allegedly computed a personal score.

Participants were randomly allocated to one of four conditions in a 2 (high/low objective goal threat) × 2 (high/low self-relevant goal threat) design. In the high objective/high self-relevant threat condition participants were informed that: *'Your personal score is 27. Research shows that most attempts to maintain or lose weight fail. Thus, the chances for you to reach or maintain your target weight are low* (objective threat). *Constantly watching how much and what you eat requires a lot of effort. Your personal score on the Lifestyle and Health Knowledge Test shows that you are not sufficiently concerned about leading a healthy lifestyle. This means that you will not be able to invest the effort required to lose or maintain weight'* (self-relevant threat). In the low objective/low self-relevant threat condition participants received the following feedback: *'Your personal score is 87. Research shows that most attempts to maintain or lose weight succeed. Thus, the chances for you to reach or maintain your target weight are high* (objective threat). *Constantly watching how much and what you eat requires a lot of effort. Your personal score on the Lifestyle and Health Knowledge Test shows that you are sufficiently concerned about leading a healthy lifestyle. This means that it is likely that you will be able to invest the effort required to lose or maintain weight'* (self-relevant threat). In the two other conditions participants received feedback that was a mixture of both types of information.

Immediately after feedback, participants filled out a questionnaire on the subjective experience of distress. Next, they were asked to write down their strategies and plans for achieving their weight goal. It was emphasized that they could take as much time as they needed. After completing their plan, they were asked to evaluate it. To examine the impact of the manipulations on dealing with immediate goal threat, participants were presented with a large bowl of chocolate

chip cookies during the final stage of the experiment. In fact, participants were told that the experiment ended at this point but that some additional time (2 min) was required to feed the measures into the computer, and that, while the computer was saving the data, the participant could eat as many cookies as she wanted. Participants were then debriefed. None of them expressed suspicion of the manipulations.

Measures

Means, SDs and, where relevant, Cronbach's α of all variables under study are presented in Table I.

Control variables. To control for individual differences in self-regulatory competence participants completed the 14-item Goal Orientation Scale (Malouff et al., 1990). This scale measures the tendency to be goal oriented and make plans for the future. Sample items are 'I spend a substantial amount of time planning how to reach my goals' and 'I am goal oriented'. The scale was included because individual differences in goal orientation may affect the dependent variables related to planning and self-control. Self-esteem (Rosenberg, 1979) was measured to control for sensitivity to the goal failure manipulation (sample items: 'On the whole, I am satisfied with myself' and 'I feel that I have a number of good qualities'). Both the Goal Orientation Scale and the Self-Esteem scale were rated on a 5-point scale ranging from 1 ('not at all') to 5 ('very much').

Table I. Means, SDs, and where relevant, Cronbach's αs of the variables under study.

		Study 1			Study 2		
		M	SD	α	*M*	SD	α
1	Distress	1.42	0.51	0.86			
1a	Threat				2.28	0.92	0.82
1b	Loss				1.61	0.83	0.85
1c	Challenge				2.51	1.15	0.88
2	Planning time	85,279	55,135		107,394	76,969	
3	Evaluation plan	6.62	1.19	0.73	6.63	1.24	0.85
4	Effort goal	5.84	1.59		6.29	1.26	
5	No. of cookies*	0.73	0.91		0.57	0.96	
6	Intended weight loss	3.58[a]	2.36		5.37[b]	3.55	
7	Restraint Scale	1.55	0.52	0.73	1.54	0.54	0.79
8	BMI	21.44[a]	1.72		22.52[b]	2.78	
9	Self-esteem	3.90	0.75	0.93	3.93	0.68	0.93
10	Goal orientation	3.25	0.70	0.89	3.27	0.66	0.88
11	Importance of goal	5.77[a]	1.83		6.51$_b$	1.65	
12	Age	21.70	4.30		22.10	4.80	

Note: Means with different superscript differ from each other at least at $p < 0.05$. *Cookie consumption: raw variable (i.e., before transformation; Study 2).

A number of dieting and weight-related variables that have been shown to affect self-regulation attempts in the eating domain (Herman & Polivy, 2004) were included as potential control variables. First, the 10-item Restraint Scale (Polivy, Herman, & Warsh, 1978) was included to measure the extent to which participants were occupied by dieting and losing weight (sample items 'Do you have feelings of guilt after overeating?' and 'Would a weight fluctuation of 2.5 kg affect the way you live your life?'). Second, one item was included to assess how important reaching or maintaining weight was for participants (1 = not at all to 9 = extremely). Third, BMI (based on self-reported weight and height), intended weight loss and whether or not any food was consumed in the past 2 h were included as control variables.

Dependent variables. Subjective distress was assessed by the 10-item state version of the Negative Affect Scale of the PANAS (Watson, Clark, & Tellegen, 1988). All items were scored on a 5-point scale ranging from 1 'not at all' to 5 'very much' and were summed to form a scale. Time spent on planning was recorded by the computer and registered in milliseconds. Inspection of the plans revealed that all participants had written down weight loss strategies. Evaluation of the plan was assessed with three items (i.e., satisfaction with plan, confidence in plan, and motivation to execute plan). The items were scored on a scale ranging from 1 'not at all' to 9 'very much' and were summed to form a scale. In addition, one question was asked about how much effort the participant was willing to invest to attain her weight goal (same 9 point scale). The number of consumed cookies was recorded by the experimenter (by counting the cookies that were left on the plate) after participants had been debriefed and left the lab.

Analyses

Two (objective goal threat: high *vs*. low) × 2 (self-relevant goal threat: high *vs*. low) analyses of variance were conducted to examine the effects of the goal threat manipulations on subjective distress, time spent on planning, evaluation of plan, effort, and number of consumed cookies. Variables relating to weight goal and diet (having eaten in the past 2 h, intended weight loss, BMI, restraint eating, goal importance), self-regulatory competence (goal orientation), and self-esteem were included as covariates if they showed significant correlations with the dependent variable (Table II, upper half). If significant effects of the goal failure manipulations are found on distress and any of the other dependent variables, additional analyses will be performed to examine whether the effects of the manipulations were mediated by distress.

Results

Descriptive analyses. Of the participants, 63% scored 1.5 or higher on the Restraint Scale, and can thus be considered restrained eaters (1.5 or 15 in a summed scale is the conventional cutoff score in research using female undergraduates). Not surprisingly, women who wanted to lose more weight,

Table II. Correlations between the dependent variables and control variables (Study 1 and Study 2).

	Food 2h	Weight loss	RS	BMI	Goal importance	Self-esteem	Goal orientation
Study 1							
Distress	−0.02	−0.03	0.19	−0.07	0.17	−0.18	0.08
Plan time	−0.22^{+}	0.08	−0.01	0.05	−0.19	0.03	−0.02
Evaluation plan	0.03	−0.10	−0.06	0.02	−0.04	−0.10	−0.10
Effort goal	0.03	0.31*	0.42**	0.19	0.67***	−0.20	0.13
No. of cookies	−0.10	0.18	−0.08	0.25^{+}	−0.12	−0.09	−0.09
Food 2 h[a]		0.04	0.05	0.05	0.04	0.18	0.03
Intended weight loss			0.36**	0.60***	0.55***	−0.18	−0.16
RS				0.15	0.58***	−0.34**	−0.05
BMI					0.25*	−0.17	−0.26*
Study 2							
Loss	0.21	−0.03	0.29*	0.05	−0.07	−0.17	0.15
Threat	0.15	0.09	0.38**	0.12	0.21	−0.34*	0.14
Challenge	−0.33*	0.14	−0.14	0.18	0.14	−0.15	−0.02
Plan time	−0.18	0.38**	0.20	0.39**	0.14	−0.10	0.08
Evaluation plan	−0.21	0.23	−0.12	0.41**	0.51***	0.15	0.23
Effort goal	−0.32*	0.41*	0.20	0.43**	0.60***	−0.01	0.32*
No. of cookies[b]	0.40**	−0.05	−0.11	−0.09	−0.14	0.07	0.06
Food 2 h[a]		−0.16	−0.18	−0.15	−0.10	0.14	−0.12
Intended weight loss			0.25^{+}	0.85***	0.24^{+}	−0.12	0.07
RS				0.14	0.27^{+}	−0.54***	−0.10
BMI					0.30*	−0.17	0.10

Note: $^{+}p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$. [a]Eaten in past 2 h: 1 = yes, 2 = no (Study 1 and Study 2), [b]Cookie consumption: transformed variable (square root transformation; Study 2).

also scored higher on the restraint scale, had a higher BMI, and rated their weight goal as more important to them (Table II, upper half). Participants who scored higher on the restraint scale rated their weight goal as more important to them and scored lower on self-esteem. Finally, women with a higher BMI rated their goal as more important to them, but were less goal-oriented.

With respect to the correlations between the control variables and the dependent variables, Table II shows that women who wanted to lose more weight, who scored higher on the restraint scale, and who rated their weight goal as more important to them, were willing to put more effort into attaining their weight goal.

Effects of potential goal failure on distress. As expected, the 2×2 ANOVA with subjective distress as the dependent variable showed a significant main effect of self-relevant threat, $F(1, 58) = 27.21$, $p < 0.001$. Participants who received feedback that achieving their weight goal was unlikely because they would not be able to invest the required effort reported more distress ($M = 1.68$) than did those who did not receive such information ($M = 1.11$). Neither a main effect for objective goal-threat, nor an interaction effect between the two types of threat was found, F's < 0.24, ns.

Table III. Interaction effects between objective goal threat and self-relevant goal threat on planning time (in ms) in Study 1 and Study 2 and cookie consumption in Study 2.

		Objective goal threat	
		Low	High
Study 1 – Planning time			
Self-relevant goal threat	Low	61,797[a]	86,912[ab]
	High	106,824[b]	74,690[ab]
Study 2 – Planning time			
Self-relevant goal threat	Low	99,302[ab]	146,723[a]
	High	113,027[ab]	70,054[b]
Study 2 – Cookie consumption*			
Self-relevant goal threat	Low	0.52[a]	0.00[b]
	High	0.44[a]	0.72[ac]

Note: Means with different superscript differ significantly from each other at $p < 0.05$, per study per variable. *Cookie consumption: transformed variable (square root transformation).

Effects of potential goal failure on planning and evaluations of plans. Next, the effect of potential goal-threat on time spent on planning was analysed. Two subjects were excluded from the analysis because they responded with extremely long planning times (>2 SD's). Significant main effects of both types of threat were absent, F's < 1.66, ns. However, a significant interaction between objective threat and self-relevant threat was found, $F(1, 57) = 4.77$, $p < 0.05$. Table III shows that among participants in the low objective threat conditions, those exposed to high self-relevant threat spent more time on planning than did those who had been exposed to low self-relevant threat. An additional *post hoc* comparison showed that, as expected, the participants in the discrepant conditions spent more time on planning than did those in the congruent conditions ($M = 97{,}532$ ms *vs.* 68,868 ms), $t(59) = 2.20$, $p < 0.05$.

A multivariate 2 × 2 analysis of variance was conducted with evaluation of plans and goal effort as the dependent variables. Intended weight loss, restrained eating and goal importance were included as covariates as these variables were significantly correlated with goal effort (Table II). No significant effects of the goal-threat manipulations were found in this analysis, all F's < 1.87, ns.

Effects of potential goal failure on self-control. It was expected that participants in the discrepant conditions would be better able to resist temptations that might compromise their weight goal compared with those in the congruent conditions. However, no interaction effect between the two types of goal threat was found, $F(1, 58) = 1.09$, ns. Instead, both main effects were significant. Participants who were told that reaching a weight goal is difficult ($M = 0.42$) ate fewer cookies than did those who were told that reaching a weight goal is relatively easy ($M = 1.03$), $F(1, 58) = 8.35$, $p < 0.01$. Participants who were told that they would not be able to invest the effort needed to reach their weight goal ($M = 0.48$) ate fewer cookies

than did those who were told that they would be able to invest the effort needed ($M = 1.00$), $F(1, 58) = 5.48$, $p < 0.05$. These results suggest that confronting participants with the possibility of failure may have boosted their dietary strategies. For explorative reasons, we examined whether the time spent on planning had affected the number of cookies consumed. The non-significant correlation between the two variables ($r = 0.13$, ns) suggests that no such depletion effect occurred (Muraven & Baumeister, 2000).

Mediation. Next, it was examined whether the effects of the goal failure manipulations were mediated by distress. Effects of the manipulations were found on planning time and cookie consumption, and on subjective distress. However, a correlation close to zero was found between subjective distress and time spent on planning ($r = 0.01$, ns), thereby ruling out distress as a mediator between the manipulations and time spent on planning.

A significant correlation between subjective distress and cookie consumption was indeed found ($r = -0.27$, $p < 0.05$): participants who were more distressed after the manipulations ate fewer cookies. Previously, it was shown that self-relevant threat, but not objective goal-threat, affected subjective distress, and that both types of threat affected cookie consumption. Hence, we had satisfied the first three requirements for establishing a relationship where subjective distress mediates the effects of the self-relevant threat manipulations on cookie consumption (Baron & Kenny, 1986). A fourth step in testing for mediation is to show that when distress is entered into the model predicting cookie consumption, the effect of the self-relevant threat manipulation becomes non-significant while the effect of distress remains significant. A hierarchical regression analysis showed that when distress was included in the analysis, the effect of self-relevant threat on cookie consumption became non-significant ($\beta = 0.20$, ns). However, distress also became a non-significant predictor of cookie consumption ($\beta = 0.20$, ns), thereby violating the fourth requirement (Baron & Kenny, 1986). The Sobel test (Sobel, 1982) provided additional confirmation that mediation did not occur ($z = 1.03$, ns).

Discussion

We assumed that confrontation with potential failure to reach a personally important goal would result in emotional distress and especially affect self-regulatory efforts when this information was presented in a way that was simultaneously reassuring (low objective or self-relevant threat) and threatening (high objective or self-relevant threat). Our findings largely confirm this assumption insofar as the time spent on planning strategies for achieving weight loss was concerned and only when self-relevant information was presented in combination with the possibility of successful goal achievement (low objective threat). No interaction effects of both types of threat were observed for self-control although the main effects of threat are in line with our hypothesis that potential goal failure may actually promote self-regulation. Participants who had

learned that their goal might be difficult to achieve were better able to withstand the temptation of chocolate cookies placed in front of them. Although these results generally support our hypotheses, some issues require further investigation. First, the role of distress needs clarification. We hypothesized that distress caused by potential goal failure might be the reason for engaging in self-regulatory efforts. However, mediation analyses revealed no such effects. Therefore, in the second study we will employ differential measures of distress in terms of threat, loss, and challenge to examine whether the potential mediating role of distress is related to the type of distress. Second, we included only participants who were concerned about their weight to make sure that the manipulation would be personally relevant. However, the relatively large amount of intended weight loss (3.6 kg on average) in women who were all in the normal weight range may have affected the extent to which they were seriously concerned with making weight loss plans. Therefore, in the second study, we will include overweight participants for whom weight loss might be more important. Finally, as predicted, participants who had been exposed to potential goal failure showed better self-control and consumed less cookies. Yet, the presence of the experimenter during this stage of the experiment may have inhibited those who received threatening information to give in to their desire to eat cookies (Herman, Roth, & Polivy, 2003). Therefore, we decided to examine the effects of potential goal failure on self-control without the presence of the experimenter in the second study.

Study 2

Participants

A total of 52 female undergraduates participated in the study for course credit. Participants who wanted to gain weight ($n = 1$), who were underweight (BMI < 18; $n = 1$), or obese (BMI > 30; $n = 1$) were excluded. Mean age of the final sample ($N = 49$) was 22.1 years (SD = 4.8). All except two participants with a goal of weight maintenance wanted to lose weight. On average participants wanted to lose 5.4 kg (SD = 3.6). Mean BMI was 22.52 (SD = 2.78); 16% ($n = 8$) were overweight (BMI > 25). Table I shows that participants in Study 2 differed significantly from participants in Study 1 on a number of weight-related characteristics. That is, women in this study had on average a higher BMI, wanted to lose more weight, and rated their weight goal as more important than did women in Study 1. Participants did not differ with respect to restrained eating, self-esteem, and goal orientation.

Procedure

The procedure for Study 2 was similar to the one employed in Study 1 with the exception of the way the cookies were introduced during the final stage of the experiment. To emphasize that they were unrelated to the study, cookies were introduced after the experiment had allegedly ended. The experimenter told that she had forgotten to administer an additional questionnaire and asked if the

participant would be willing to complete the questionnaire, presented her with cookies for making up the mistake, and left the room. After 2 min (the same period of time that was available for cookie consumption in the first study), the experimenter returned and ended the experiment. Participants were debriefed and reported no suspicion of the manipulations.

Measures and analyses

Apart from the assessment of distress, the same measures as in Study 1 were employed (Table I). Threat, loss, and challenge were each measured with three adjectives (Ferguson, Matthews, & Cox, 1999): Threat with 'upset', 'insecure', and 'unconcerned' (reverse scored); loss with 'depressed', 'sad', and 'discouraged'; and challenge with 'challenged', 'inspired', and 'encouraged'. All items were scored on a scale ranging from 1 'not at all' to 5 'very much'. As Table I shows, internal consistency for all three subscales was good.

Self-control was again assessed by counting the number of cookies that were eaten. However, in the present study, the distribution was highly skewed (skewness = 1.72, $z = 5.05$). Therefore, a square root transformation was used to reduce skewness to an acceptable level (skewness = 1.02, $z = 2.98$).

The same analyses as in Study 1 were performed in the present study. Control variables were again included as covariates if they showed significant correlations with the dependent variables (Table II).

Results

Descriptive analyses. Of the participants, 55% scored 1.5 or higher on the Restraint Scale and can thus be considered restrained eaters. The pattern of correlations between intended weight loss, restrained eating, BMI, goal importance, self-esteem and goal orientation, was in the same direction as in Study 1.[2] Correlations that were significant in Study 1 were significant in this study as well, or approached statistical significance ($p < 0.10$). The only exception was the correlation between BMI and goal orientation that was significant in Study 1 but not in this study. As in Study 1, women who wanted to lose more weight had a higher BMI, and tended to score higher on restrained eating and goal importance. Women who scored higher on restrained eating, scored lower on self-esteem, and tended to rate their goal as more important. Finally, women with a higher BMI rated their goal as more important.

With respect to the correlations between the control variables and the dependent variables, more correlations were significant in this study compared with Study 1. This may be due to the fact that weight was more of an issue for these women (i.e., they wanted to lose more weight, had higher BMI, and rated their goal as more important than did women in Study 1). Women who wanted to lose more weight spend more time on planning and were willing to invest more effort. The same was true for women with higher BMI. In addition, they were also more satisfied with their plan. Women who rated their goal as more important were more satisfied with their plan and were willing to put more effort into attaining

their goal. Women who scored higher on restrained eating reported more loss and threat, whereas women who scored higher on self-esteem reported less threat after the manipulations. Table II further shows that whether or not the participant had eaten food in the past 2 h was related to some of the dependent variables.

Effects of potential goal failure on distress. A multivariate 2 (objective threat) × 2 (self-relevant threat) analysis of variance was conducted with loss, threat, and challenge as dependent variables. Restrained eating, self-esteem, and whether or not the participant had eaten in the 2 h prior to the experiment were included as covariates (Table II). A significant multivariate effect was found for self-relevant threat, $F(3, 40) = 6.57$, $p < 0.001$. Participants who received feedback that achieving their weight goal was unlikely because they would not be able to invest the effort required reported more loss ($M = 1.99$) than did those who did not receive such information ($M = 1.20$), $F(1, 42) = 12.41$, $p < 0.001$. Participants in the high self-relevant condition also reported more threat ($M = 2.65$) than did participants in the low self-relevant condition ($M = 1.89$), $F(1, 42) = 8.31$, $p < 0.01$.

In contrast, participants in the low self-relevant threat condition reported more challenge ($M = 2.89$) than did participants in the high self-relevant threat condition ($M = 2.15$), $F(1, 42) = 5.86$, $p < 0.05$. No other effects were found, F's < 0.85, ns.

Effects of potential goal failure on planning and evaluation of goals. Next, the effect of potential goal threat on time spent on planning was analysed. Table II shows that participants who had a higher BMI and who wanted to lose more weight, spent more time on planning. As BMI and intended weight loss were highly correlated, only BMI was included as a covariate. Significant main effects of objective goal threat manipulations were absent, F's < 1.19, ns. However, a significant interaction effect between objective threat and self-relevant threat was found, $F(1, 44) = 4.25$, $p < 0.05$. Table III shows that among participants in the high objective threat condition, those in the low self-relevant threat condition spent more time on planning than did those in the high self-relevant threat condition. An additional *post hoc* comparison showed that, as expected, the participants in the discrepant conditions spent more time on planning than did those in the congruent conditions ($M = 129{,}201$ ms *vs.* 84,678 ms), $t(47) = 2.09$, $p < 0.05$.

A 2 × 2 MANOVA was conducted with evaluation of plans and goal effort as the dependent variables. BMI, goal importance, goal orientation and food eaten prior to the experiment were included as covariates (see Table II; intended weight loss was not included because of its high correlation with BMI). Neither main effects nor interaction effects were found, F's < 1.35, ns.

Effects of potential goal failure on self-control. Food eaten prior to the experiment was included as a covariate in the analysis with number of cookies as the dependent variable (see Table II). No main effects were found in this analysis, both F's < 2.32, ns. However, in line with the expectations an interaction effect

was found, $F(1, 44) = 5.14$, $p < 0.05$. Table III shows that when objective goal threat was low, participants in the low self-relevant condition ate as many cookies as did participants in the high self-relevant threat condition. However, when objective goal threat was high, participants in the low self-relevant threat condition ate fewer cookies (in fact they ate none) than did the participants in the high self-relevant threat condition.

As in Study 1, we examined for explorative reasons whether time spent on planning affected the number of cookies consumed. The correlation between the two variables was indeed significant ($r = -0.32$, $p < 0.05$), but in the opposite direction of a depletion effect. That is, participants who spent more time on planning ate fewer cookies.

Mediation. Next, it was examined whether the effects of the goal failure manipulations were mediated by distress. As in Study 1, effects of the manipulations were found on planning time and cookie consumption and on subjective distress. Also as in Study 1, the subscales of subjective distress were unrelated to time spent on planning (loss: $r = -0.03$, ns; threat: $r = 0.05$, ns; challenge: $r = 0.16$, ns), thereby ruling out subjective distress as a mediator between the manipulations and time spent on planning.

A significant correlation between challenge-related distress and cookie consumption was found ($r = -0.33$, $p < 0.05$): Participants who reported more challenge after the manipulations were less likely to have eaten one or more cookies. The correlations between threat or loss-related distress and cookie consumption were not significant ($r = 0.21$, ns, and $r = 0.22$, ns, respectively).

Previously, it was shown that self-relevant threat, but not objective goal-threat, affected challenge-related distress and that an interaction between self-relevant threat and objective threat affected cookie consumption. A consequence of the latter is that it is only useful to look for mediator effects within the group of participants in the high objective threat condition.

A hierarchical regression analysis with cookie consumption as the dependent variable, self-relevant threat entered at step 1 and challenge entered at step 2, showed that the effect of self-relevant threat remained virtually unchanged and significant when challenge was controlled for [β reduced from -0.63 ($p < 0.001$) to -0.59 ($p < 0.01$)]. This means that in the present study, the effects of self-relevant threat and challenge on cookie consumption were independent of each other.

Discussion

The findings in this study replicated those of the first study insofar as information about the objective chances to reach a goal did not affect distress while information about one's ability to reach a goal (self-relevant threat) had a significant effect on the experience of subjective distress in terms of challenge-related, loss-related, and threat-related distress. In contrast with expectations, discriminating between types of distress did not support our assumption that

feelings of distress are responsible for engaging in self-regulatory efforts. The effects of the potential goal failure manipulation on planning proved similar to the results of the first study, although the women in Study 2 were found to spend somewhat more time on planning than the women involved in Study 1(marginally significant; $t(109) = 1.76$, $p = 0.08$). In addition, a different type of discrepancy was involved. Whereas in the first study women who had received high self-relevant and low objective goal-threatening information spent the most time on planning strategies for weight loss, in the second study, the women who received high objective and low self-relevant goal-threatening information did so. In addition to spending more time on planning these women also ate the least cookies. In a sample of women including overweight participants, it thus appears that high objective goal-threat in combination with low self-relevant threat offers the best opportunities for engaging in self-regulatory efforts.

General discussion

We started this investigation under the assumption that goal-related distress does not necessarily undermine self-regulation but may actually increase engagement in self-regulatory effort. We hypothesized that confrontation with potential goal failure would lead to distress which in turn might activate efforts to invest in future goals and help in withstanding temptations that impose an immediate threat to the goal. We also hypothesized that potential goal failure presented in a non-congruent fashion, that is, in combinations of high self-relevant threat and low objective threat or vice versa, would provide the best opportunities for engaging in self-regulation. Our findings indicate that potential goal failure, when self-relevant, indeed creates some emotional distress, but also that feelings of distress are not responsible for increased self-regulation. It appears, then, that the mere experience of potential goal failure may be sufficient for increased self-regulatory effort but only when the risk of goal failure is accompanied with information that provides some sense of trust in being able to deal with it. As the risk of not being able to achieve an ambitious goal is inherent in self-regulation, these findings are important for improving our understanding of the relationship between potential goal failure and emotional distress, the role of distress in self-regulation, and the role of threatening information in combination with reassuring information in goal striving and resisting temptation. We will address each of these issues below.

Confrontation with the possibility of goal failure was associated with the experience of distress, although the level of distress was rather low regardless of whether it concerned negative affect (Study 1) or feelings of loss, threat or challenge (Study 2) (mean values lower than 2.51 on a 5-point scale). Consistent with previous studies, we found that possible goal failure that was self-relevant (raising doubt about one's ability to act upon a personal goal) is the primary cause of distress whereas more objective information about the risk of failure that does not involve the self was not related to distress. Even when discriminating between types of emotional distress in terms of loss, challenge, or threat we found

no effects of objective goal threat. This result may not sound surprising from the perspective of a large body of research on fear appeals, demonstrating that objective information about health threats is mostly processed in a defensive way (Witte & Allen, 2000). Nevertheless, we did not expect that participants would show no sign of being emotionally upset when exposed to such information.

Our research was driven by the idea that some amount of distress would be adaptive as it would create a sense of urgency to act upon the goal. However, even though confrontation with self-relevant threatening information was experienced as distressing, we found that feelings of distress were not responsible for engaging in self-regulatory effort. In Study 1, we found no evidence for a mediating effect of negative affect on planning of strategies or withstanding temptation. Therefore, we included different types of distress in Study 2 to examine whether specific forms of distress would mediate the effects on self-regulation. Previous studies have emphasized the differential role of different types of distress in self-regulation. Research by Carver and Scheier (1990), for example, suggests that negative affect resulting from slower-than-expected progress to a goal would increase efforts to reach the goal whereas positive affect, resulting from more rapid progress to a goal than expected, would impair self-regulation because of coasting effects. However, although women in the high self-relevant threat condition reported higher levels of negative affect (feelings of loss and threat) and lower positive affect (feeling challenged), mediation analyses showed that these feelings did not affect self-regulation in any way (Study 2). It has been suggested that low arousal forms of distress like sadness might impair attending to long-term goals as these forms of distress would focus attention to the here and now (Leith & Baumeister, 1996). However, Study 2 suggests no mediating effects of sadness on either planning strategies for distal goals or resisting immediate temptation. Our study may be different from previous studies as we intended to manipulate a specific form of goal-related distress but still the results seem to allow only one conclusion, namely that there are no mediating effects of distress in the relationship between potential goal failure and self-regulation. A similar conclusion was drawn in a recent study by Baumeister and colleagues investigating the mediating role of emotional distress in the effects of social exclusion on self-regulation (Baumeister, DeWall, Ciarocco, & Twenge, 2005). The absence of a mediating role of distress in self-regulation makes sense from the recently proposed model of two systems being involved in self-regulation, which states that the 'hot' stress system dealing with immediate temptations and frustrations reacts independently from the 'cool' system that is engaged in planning and goal striving (Metcalfe & Mischel, 1999).

If it is not distress that is the reason for engaging in self-regulatory effort when confronted with possible goal failure, what is? Our studies suggest that it may be the mere experience of learning that a goal is threatened while at the same time receiving some reassurance in prolonged goal engagement. In Study 1, exposure to low objective threat and high self-relevant threat resulted in significantly longer planning times although no such interaction effect was observed for

resisting temptation. In Study 2, a similar pattern was observed in women who were exposed to high objective and low self-relevant threatening information. These women devoted more time to planning their strategies, and were also better able to exert self-control. Interestingly, the results for self-control in Study 2 revealed no depletion effect of planning on resisting temptation as more time spent on planning was related to decreased cookie consumption, suggesting that considering one's strategies for future goal pursuit may have boosted self-control. This contradicts previous research examining the effects of a task requiring self-control (Muraven & Baumeister, 2000) but is consistent with other studies examining depletion effects (Martijn, Alberts, & De Vries, 2006). There was no indication of a preload effect either. In many studies on restrained eaters, it appears that eating a small portion elicits an inhibitory breakdown (e.g., Heatherton, Polivy, & Herman, 1990). As a significant proportion of women participating in Study 2 were restrained eaters, but did not show any sign of increased cookie consumption, it appears that thinking about goal achievement may have protected them from disinhibited eating.

It thus seems that both studies provide some evidence for the idea that receiving information that is both threatening and reassuring may boost self-regulatory efforts, although the effects in Study 2 were more consistent across self-regulation measures, which probably relates to sample characteristics. Whereas the women in Study 2 were more often overweight, had more ambitious weight loss goals, and generally found weight loss more important, the normal-weight women in Study 1 may have been less seriously concerned about their weight. For these normal-weight women weight loss might have been a genuine goal but not one they really bothered about. Overall, they spent less time on planning their strategies than the participants in Study 2 and appeared to be less distressed by the goal failure manipulation (although we were unable to test the latter because of different stress variables in both studies). The women in Study 1 may be representative of the large group of young women who are preoccupied with dieting even though there seems to be no clear reason for worry about their weight or their eating habits (Rozin, Bauer, & Catanese, 2003). It may, therefore, be that especially these women responded to the condition of low objective goal threat and high self-relevant threat because they were more concerned about their ability to diet than about their weight. Interestingly, both in Study 1 and Study 2 no effects of goal failure manipulations were found for evaluation of plans and willingness to spend effort for executing these plans, suggesting that the behavioural effects of potential goal failure in terms of planning and self-control are not related to motivation for self-regulation or feeling good about having made a plan.

Together, these findings suggest that the effects of confrontation with potential goal failure on self-regulation are primarily related to contrasting an opportunity to reach the goal with the necessity to act, thus emphasizing the adaptive role of some goal frustration. Research by Oettingen and colleagues on mental contrasting of an ambitious goal with the negative reality supports this line

of reasoning. In a series of studies, they found that participants who were asked to consider their goals from the perspective of the present negative reality identified better strategies for goal achievement and increased their efforts to achieve the goal (Oettingen, Pak, & Schnetter, 2001). These effects were also found in a sample of obese women who wanted to lose weight (Oettingen & Wadden, 1991). In a similar vein, research on defensive pessimism suggests that considering a good opportunity while also considering the possibility of failure may increase self-regulation (Cantor & Norem, 1989). Our studies have also shown that some goal frustration may be adaptive in a sense that it may promote efforts for continued goal pursuit, but only when goal frustration is accompanied by the possibility that one is able to manage this frustration. Future studies should examine more explicitly in what way dealing with goal frustration help to maintain goal striving (De Ridder & Kuijer, 2006). The implications of this line of reasoning for the promotion of health behaviour are obvious. Whereas many health promotion efforts tend to emphasize the benefits of health behaviour in the long run (longevity, absence of disease), often without success, they typically do not provide individuals with smart strategies to deal with the immediate temptations that may violate their goal. More emphasis in health promotion efforts to teach individuals to cope with the inherent frustration in the pursuit of ambitious goals may, therefore, prove a more successful strategy.

Limitations of these studies should be mentioned. First, both studies involved relatively small sample sizes. However, since we were able to demonstrate significant effects on self-regulation in these small samples, our findings suggests that potential goal threat is a promising concept for future research on self-regulation. Second, only 55% (Study 2) to 63% (Study 1) of the women in this study considered themselves to be restrained eaters, which may have affected their willingness to consider their long-term weight goals. However, our findings suggest no critical role for the concept of restraint as both restrained and unrestrained eaters proved to benefit from contrasting information about risks and opportunities for regulating their eating behaviour in the future. Further research should examine whether confrontation with contrasting information might counteract the compromising role of distress in restrained eaters (Heatherton et al., 1990). Third, it should be noted that we only measured immediate responses to the goal threat manipulations without considering how they might affect self-regulation attempts in the long run. Although it is not common to investigate prolonged effects in experimental studies, it may be worthwhile to examine in what way confrontation with potential goal threat still influences self-regulation after some time in future studies. Bearing these limitations in mind, we may conclude that potential goal failure improves self-regulation in terms of increased willingness to invest in long-term goals and decreased succumbing to temptations and that these effects are not mediated by emotional distress even though potential goal failure is experienced as somewhat upsetting.

Notes

[1] We thank one of the reviewers who noted that 'objective goal threat' may be similar to the concept of 'goal difficulty' and 'self-relevant threat' bears resemblance to the concept of 'self-efficacy'.

[2] The correlations between the control variables in the two studies were compared using Fisher's z-transformations (J. Cohen & P. Cohen, 1983). No significant differences were found.

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