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## Psychology & Health

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/gpsh20>

### Improving diabetes self-management by mental contrasting

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Published online: 27 Feb 2012.

To cite this article: Marieke A. Adriaanse, Denise T. D. De Ridder & Iris Voorneman (2013) Improving diabetes self-management by mental contrasting, *Psychology & Health*, 28:1, 1-12, DOI: [10.1080/08870446.2012.660154](https://doi.org/10.1080/08870446.2012.660154)

To link to this article: <http://dx.doi.org/10.1080/08870446.2012.660154>

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## Improving diabetes self-management by mental contrasting

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*(Received 12 May 2011; final version received 19 January 2012)*

Diabetes patients often fail to adhere to self-management activities, such as losing weight by exercising and dieting. The present study tested the efficacy of a minimalist intervention consisting of only the self-regulation strategy ‘mental contrasting’ (Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition*, 18, 101–129) in promoting these self-management activities among a clinical sample of type 2 diabetes patients ( $N = 64$ ). Half of the participants were assigned to a positive indulging condition (fantasising about positive outcomes of losing weight) and the other half of the participants were assigned to a mental contrasting condition (fantasising about positive outcomes of losing weight and then contrasting these fantasies with obstacles in the present reality). Results showed that, one month later, participants in the mental contrasting condition had improved their diabetes self-management, and in particular their dieting behaviour, by a larger extent than participants who merely indulged in the positive future. It was concluded that although more elaborate interventions may yield stronger results, adding a mental contrasting exercise to their usual care may be a highly feasible, low-cost alternative to promote diabetes self-management.

**Keywords:** mental contrasting; diabetes; self-management; diet; exercise

Over the past decades, type 2 diabetes mellitus has developed into a major public health issue. For example, in the Netherlands there are over 600,000 patients known, a number which is estimated to increase by 33% over the next 20 years (RIVM, 2006). In the beginning, type 2 diabetes is an asymptomatic disease, but when left untreated, it can lead to life threatening complications including blindness, foot amputations, kidney failure, and cardiovascular disease (Heine & Stehouwe, 2001). The main goal of diabetes self-management is to control blood glucose levels and cardiovascular risk and to prevent long-term complications. Self-care activities include diet adherence, exercising, medication use, and self-monitoring activities like blood glucose testing (Hampson, Glasgow, & Toobert, 1990). The success of diabetes self-management depends heavily on patients’ ability to integrate these self-care activities into their daily routines.

As patients often have trouble adhering to these self-care activities (Thoolen, De Ridder, Bensing, & Rutten, 2008), numerous self-management interventions have

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been designed to support patients with diabetes in their adherence to these life-style changes (e.g. Norris, Engelgau, & Narayan, 2001; Thoolen, De Ridder, Bensing, Gorter, & Rutten, 2009). These interventions in which patients are taught self-regulatory skills have been found to be effective in increasing diabetes self-care, by bringing about changes in self-management activities or proactive coping skills (e.g. Norris et al., 2001; Thoolen, De Ridder, Bensing, Gorter, & Rutten, 2008).

To illustrate, the self-management intervention by Thoolen, De Ridder, Bensing, Gorter, et al. (2008) specifically targeted proactive coping skills. This intervention consisted of four group sessions and two individual sessions in which participants worked according to a five-step plan that included several self-regulation strategies (goal setting, identifying barriers, generating coping solutions, formulating implementation intentions, and evaluation of progress) that were expected to promote proactive coping skills. Results showed that this intervention had a moderate effect on diabetes self-care behaviours, which is in line with a recent meta-analysis (Fan & Sidani, 2009) that demonstrated that on average self-management interventions have a small to moderate (Cohen's  $D = 0.30 - 0.43$ ) effect on diabetes self-management behaviours.

Despite the large number of interventions that have been tested, and their overall positive results, it is, however, still unclear what the effective ingredients of these interventions are, because – as is also illustrated above – studies often combine a host of self-regulation strategies (Thoolen et al., 2009). Rather than testing a host of combined self-regulation strategies in one intervention, testing the effects of separate self-regulation strategies would help to shed more light on which strategies may be crucial in fostering diabetes self-management. Even more importantly, such an endeavour would help to identify whether ‘minimalist’ self-regulation strategies that do not require much additional time or costs (and that could thus be easily included in usual care regimens), but that still instill meaningful improvement in diabetes self-management exist.

At present, the interventions that are tested generally involve multiple phases and various strategies which make them time-consuming and costly. Although it is to be expected that no minimalist intervention of only one strategy will be equally effective as previously validated interventions that comprise a host of effective strategies and that are administered by skilled health care providers, they might still provide practitioners with a less costly alternative that can be incorporated in patients' usual care. Therefore, in the present study, we tested the effectiveness of mental contrasting as a particularly promising (e.g. Oettingen, 2000; Oettingen, Mayer, Sevincer, Stephens, Park, & Hagenah, 2009; Oettingen, Pak, & Schnetter, 2001), easy to implement, and minimalist strategy for promoting diabetes self-management activities.

Mental contrasting is a motivational technique that helps people to translate their expectancies of success and the incentive value of being successful into ‘smart’ goal-striving. That is, for individuals with reasonable expectancies of being successful in attaining their desired goal, mental contrasting fosters commitment to this goal, while for individuals with low expectancies of success, mental contrasting leads people to disengage from the unattainable goal. The strategy of mental contrasting involves going through three consecutive steps. First, individuals identify a wish for behaviour change which they also expect to be able to attain (e.g. exercising more often). Then, they are asked to imagine and fantasise about the most positive outcome of realising this wish for behaviour change (e.g. being healthier and having

the energy to play with grandchildren again). Subsequently, they identify and reflect on the negative reality standing in the way of realising their wish (e.g. not having any time to go to the gym).

This procedure of first reflecting on the most positive outcome and then thinking about the negative reality standing in the way of this positive outcome makes the desired future and present reality simultaneously accessible and creates a strong association between them. The negative reality is then perceived as an obstacle that stands in the way of attaining the desired future and one becomes more aware of the discrepancy between the present reality and the desired future. Due to this experienced discrepancy, when expectations of being capable of reaching the future state are high, a person will experience a *necessity to act*, and in turn increase *goal commitment* to realise the desired future. As a result of this increased goal commitment there is an increased likelihood that this person act upon his/her goals (Oettingen, Honig, & Gollwitzer, 2000; Oettingen et al., 2001). In addition to fostering goal commitment, mental contrasting has been suggested to aid the *identification of obstacles* that hinder goal realisation, which in turn promotes goal-directed behaviours to overcome these obstacles (Oettingen et al., 2001; Oettingen, Mayer, & Thorpe, 2010; Stadler, Oettingen, & Gollwitzer, 2009).

Numerous studies have now indicated that when people aim to attain a desirable goal and have relatively high expectations regarding their ability to overcome their obstacles to attaining this goal, mental contrasting leads to strong goal commitment, more process simulation (see Taylor, Pham, Rivkin, & Armor, 1998, for evidence for the benefits of process over outcome simulation), and more successful goal-striving (e.g. Oettingen, 2000; Oettingen et al., 2009; Oettingen, Stephens, Mayer, & Brinkmann, 2010), for different types of goals (e.g. giving and receiving help, getting to know an attractive stranger, combining work and family life, and smoking reduction; Oettingen, 2000; Oettingen, Mayer et al., 2010; Oettingen, Stephens et al., 2010). It is important to stress that mental contrasting leads to 'smart', expectancy-dependent goal striving. This means that while this strategy is highly effective in promoting commitment and goal-striving for individuals who believe that they have a chance of attaining this goal (high expectancies of success), for individuals with low expectancies of success, mental contrasting leads people to disengage from the idea of realising the desired future ('smart disengagement').

In experimental studies on mental contrasting and behaviour change, the effectiveness of mental contrasting for individuals with positive expectations is generally pitted against a *positive indulging* condition, where people merely fantasise about the positive future related to attaining their goals. This fantasising about the future seduces people to mentally enjoy the future without performing any action towards their goals (Oettingen et al., 2001). Due to focusing on the desired future only, people fail to realise the discrepancy between the here and now and the desired future, and thus do not experience a necessity to act to attain this positive future. As a result, individuals with high expectations of success who merely indulge in the positive future do not show the increase in goal-commitment or goal-directed behaviour that is commonly observed in case of mental contrasting (Oettingen et al., 2001).

In view of the positive effects that have been reported for mental contrasting, the aim of the present study is to find out whether mental contrasting can also be successfully applied to promote self-management activities in diabetes patients. To the best of our knowledge, the effect of mental contrasting alone has

been studied in the health domain only once with regard to smoking cessation (Oettingen, Mayer et al., 2010), but not for any other health behaviours or in a clinical sample, nor for diabetes self-management specifically (but see: Stadler, Oettingen, & Gollwitzer, 2009, 2010, for studies combining MC with other self-regulation strategies in the health domain). The present study is thus the first to test the efficacy of mental contrasting in promoting self-management among a clinical sample of patients with type 2 diabetes.

Moreover, to the best of our knowledge, the present study is the first to test the effectiveness of such a minimalist intervention consisting only of one self-regulation strategy in the domain of diabetes self-management. If adding mental contrasting to their usual care regime would improve patients' self-care activities, this minimalist strategy could be easily incorporated into this regime, without requiring additional resources (such as time, money, or people) as is generally the case for intervention programs.

As outlined above, type 2 diabetes patients have to perform self-management activities on a daily basis to manage their disease well. This self-management consists of a variety of tasks ranging from checking their blood glucose levels and using medication on a regular basis to regular exercise and diet prescriptions. As many studies have indicated that diabetes patients often fail to adhere to these self-management activities despite having strong expectations of succeeding (Thoolen, De Ridder, Bensing, & Rutten, 2008), it was hypothesised that mental contrasting would be a particularly effective strategy for enhancing self-management activities. Following the line of reasoning that people with low expectations could disengage from their goals and stop trying to lose weight, only participants with high expectations will be recruited for the study, since it is not wishful for patients with type 2 diabetes to disengage from their health goals.

## Method

### *Participants and design*

We asked general practitioners from four different practices in the South of the Netherlands to send a letter to their patients with type 2 diabetes about the study. Eighty potential participants sent back a prepaid form in which they indicated that they met the inclusion criteria and agreed to receive a screening call. The willing participants were subsequently screened over the telephone before being included. The inclusion criteria were being motivated to lose weight, having a body mass index (BMI) above 25, having high expectations of weight loss while at the same time experiencing difficulties, and speaking Dutch fluently. We specifically recruited motivated participants who experienced relatively high expectations of success, because mental contrasting has been found to increase goal commitment and goal-directed behaviour only when the anticipated future is something that is perceived as desirable and feasible. A total of seven patients were excluded after completing the screening calls, leaving 73 patients. This meant that no additional patients needed to be recruited as even when taking into account a 10% drop out rate, this would still leave sufficient power (0.80) to detect a small to medium effect ( $f=0.15$ ).

Participants were invited to come to their general practice to fill out some questionnaires and to perform a short mental exercise on top of the usual care program they generally received at their general practice. Three patients dropped out

during the first session and two patients did not fill out the time 1 questionnaire. Of the remaining participants ( $N=68$ ), four patients who, despite previous efforts to include only patients with relatively high expectations, held low expectations ( $<3$  on one of two items assessing expectancies being successful in increasing their self-management activities; see Materials) were excluded from the analyses. This resulted sample of 64 participants who were included in the analyses. Participants were on average 61.05 years of age ( $SD=7.31$ ), had a BMI of 31.75 ( $SD=5.19$ ), and had been diagnosed with diabetes for 5.81 years ( $SD=3.74$ ). Of the participants, 56.2% were males.

### ***Procedure and design***

The study had a 2 Time (baseline vs. follow-up: within participants)  $\times$  2 Condition (indulging vs. mental contrasting: between participants) design. At baseline, participants were seen by the researcher in their own general practice. Participants' height and weight were measured according to the standard procedure used in their general practice, and they filled out a questionnaire including demographics (age, gender, years since diagnosis), and questions about their diabetes self-management activities. Participants were randomly assigned (alternating between conditions based on appointment time) to one of the two experimental conditions in which they were either asked to perform a mental contrasting exercise or to fantasise about the positive future only. After this exercise, an appointment was made for the 1-month follow-up at the general practice to fill out the diabetes self-management questionnaire and to be weighed again by a researcher blind to the experimental conditions.

### ***Mental exercise***

In the first part of the mental exercise, all participants were asked to name their weight loss goal ('My weight goal is to lose... kilogram'). In the second part of the mental exercise, all participants had to write down the most positive aspect that they associated with reaching this weight loss goal, and were then invited to mentally elaborate on this positive outcome for a few minutes by reporting the events and feelings they associated with this outcome. The instructions, which were derived from Oettingen (2000) were read out loud:

*What is the most positive aspect of reaching your weight loss goal? Write this down in one keyword. Try to depict this situation. What are thoughts, experiences and feelings that you can relate to this positive aspect? Mentally elaborate on these aspects and fantasize about them, and write them down.*

Examples of positive outcomes that participants provided are: '... being able to play with my grandchild...', '...less negative comments from others...', and '...being able to move around better...'. Participants in the positive indulging condition were then asked to elaborate on another positive outcome to let them indulge in the positive future. Participants in the mental contrasting condition, however, went through a different third phase. This third part of the exercise involved naming a situation in the present reality that stands in the way of attaining their weight loss goal, and elaborating on the events and feelings

associated with this obstacle (cf Oettingen, 2002; Oettingen et al., 2009; Oettingen, Stephens et al., 2010):

*Sometimes a wish does not become fully realized, regardless of how much one hopes it did and the effort one puts in achieving the goal. What would be the most important obstacle standing in your way of achieving your weight loss goal? Write this down in one keyword. Try to depict this situation. What are thoughts, experiences and feelings that you can relate to this obstacle? Mentally elaborate on these aspects and fantasize about them, and write them down.*

Examples of obstacles were: ‘...having candy in the house for when grandchildren visit...’, ‘...having an irregular eating pattern...’, and ‘...my job does not me allow to exercise regularly...’. The mental exercise was brought to an end by letting all participants, from both the indulging and the mental contrasting condition, write down their goal on a memory card they could take home and were asked to put this somewhere they would see it daily, and they were asked to explicitly think about the mental exercise.

### ***Diabetes self-management***

Diabetes self-management activities of the patients were measured using the widely used summary of the Diabetes Self Care Activities measure (DSCA; Toobert, Hampson, & Glasgow, 2000). The scale includes 10 items covering self-management of diet, exercise, blood glucose testing, and foot care. As the mental contrasting exercise was directed towards the goal of weight loss, for the present study only the seven items, regarding diet (five items) and exercise (two items) were included. Scores for each item (e.g. ‘On how many of the last SEVEN DAYS did you consume at least five portions of fruit and vegetables’) were given on 8 point-scales ranging from 0 to 7 days. An overall self-management score was calculated by taking the average of the seven items. In addition, separate diet self-management scores and exercise self-management scores were calculated by taking the average of the five (diet) or two (exercise) relevant items.

### ***Expectations***

Expectations of success in increasing their self-management activities was assessed by two items (How confident are you that you will be able to exercise four to five times a week/stick to your adhere to the dietary recommendations?) on 7 point scales ranging from 1 (*very low*) expectations to 7 (*very high*) expectations.

## **Results**

### ***Descriptives***

Participants on average wanted to lose 10.8% of their weight = 10.40 kg (SD = 7.50), and had strong expectations to be able to exercise four to five times a week ( $M = 5.84$ ,  $SD = 1.42$ ), and to be able to adhere to their diet ( $M = 5.75$ ,  $SD = 1.14$ ).

### **Randomisation check**

Separate ANOVAs for age, years since diagnosis, BMI, goal size (percentage of weight participant wanted to lose), diet expectations, exercise expectations, and diabetes self-management at T0 with Condition (indulging *vs.* mental contrasting) as the independent variable were performed to check whether randomisation was successful. None of the ANOVA's showed any significant effects, indicating successful randomisation, all  $p$ 's  $> 0.11$ .

### **Self-management activities**

A repeated measures ANOVA was performed with Time (baseline *vs.* follow up) as a within participants factor, Condition (indulging *vs.* mental contrasting) as between participants factor and overall self-management activity as dependent variable. This analysis yielded a significant effect of Time: participants scored higher on self-management activity at follow-up than at baseline,  $F(1,62)=4.50$ ,  $p < 0.04$ ,  $\eta_p^2=0.07$ . Importantly, there was also a significant Time  $\times$  Condition interaction,  $F(1,62)=3.84$ ,  $p=0.05$ ,  $\eta_p^2=0.06$ . Simple main effects indicated that the effect of Time was significant in the mental contrasting condition,  $F(1,35)=7.44$ ,  $p=0.01$ ,  $\eta_p^2=0.18$ , with participants scoring higher at follow-up than at baseline. However, the effect of Time failed to reach significance in the indulging condition,  $F < 1$ .

The effect on overall self-management activities was also analysed for items regarding diet and exercise separately. Results for *diet* self-management showed a similar pattern compared to the results for overall self-management: A significant Time  $\times$  Condition interaction was found,  $F(1,62)=4.84$ ,  $p=0.03$ ,  $\eta_p^2=0.07$ , with higher scores at follow-up than at baseline. Simple main effects again indicated that this effect of Time was significant in the mental contrasting condition,  $F(1,35)=5.44$ ,  $p=0.03$ ,  $\eta_p^2=0.13$ , but not in the indulging condition,  $F < 1$ .

Results for *exercise* self-management only showed a significant effect of Time with overall higher scores at follow-up ( $M=4.24$ ,  $SD=1.96$ ) than at baseline ( $M=3.74$ ,  $SD=1.95$ ),  $F(1,62)=4.11$ ,  $p < 0.05$ ,  $\eta_p^2=0.06$ . Although, as expected, participants in the mental contrasting condition significantly increased their exercise self-management,  $F(1,35)=4.50$ ,  $p < 0.05$ ,  $\eta_p^2=0.11$ , whereas participants in the indulging condition did not increase their exercise self-management,  $F < 1$ , the Time  $\times$  Condition interaction was far from significant,  $p=0.60$ . There is thus only very limited evidence for a difference between the two conditions in exercise self-management which has to be interpreted with care as interpreting insignificant interactions may increase the chance for a Type I error. Means and standard deviations for overall self-management and for the two subscales separately can be found in Table 1.

### **Weight reduction**

Correlations between diabetes self-management (exercise + diet subscales) at T0 and T1 and weight loss (weight T0 – weight T1) were calculated to confirm the validity of the self-reported scores for diabetes self-management. As expected, T1 self-management was positively associated with weight loss,  $r=0.28$ ,  $p < 0.05$ , indicating that participants with higher scores for self-management had lost more weight than participants with lower scores for self-management. T0 self-management was not

Table 1. Means and standard deviations (*italics*) for self-management scores at T0 and T1.

		Self-management: overall	Self-management: diet	Self-management: exercise
Positive indulging	T0	5.22 <i>0.92</i>	5.67 <i>1.02</i>	4.09 <i>2.16</i>
	T1	5.24 <i>0.95</i>	5.56 <i>1.06</i>	4.45 <i>1.87</i>
Mental contrasting	T0	4.88 <i>1.10</i>	5.43 <i>1.27</i>	3.47 <i>1.74</i>
	T1	5.39 <i>1.05</i>	5.92 <i>1.04</i>	4.08 <i>2.04</i>

significantly associated with weight loss,  $r=0.09$ ,  $p=0.47$ . Moreover, when examining the correlation of T1 self-management and weight loss for both conditions separately, it was only significant in the mental contrasting condition,  $r=0.38$ ,  $p < 0.05$ , but not in the indulging condition,  $r=0.08$ ,  $p=0.67$ . The correlation of T0 self-management and weight loss was not significant in the mental contrasting condition,  $r=0.09$ ,  $p=0.61$ , nor in the positive indulging condition  $r=0.17$ ,  $p=0.39$ .

On average participants had lost 0.74 kg (SD = 1.92; range + 4.5–6.9 kg; 23.4% gained weight, 15.6% did not lose or gain weight and 61% lost weight), with participants in the mental contrasting condition losing more weight ( $M=0.96$ , SD = 2.06) than participants in the indulging condition ( $M=0.46$ , SD = 1.71). However, this difference between conditions was not statistically significant,  $p=0.30$ .

### General discussion

The goal of this study was to investigate whether the way patients with type 2 diabetes think about their weight loss goals has an effect on diabetes self-management for weight loss. Specifically, it was investigated whether mental contrasting, as opposed to indulging, is an effective, minimalist self-regulation strategy to promote diabetes self-management. Results indicated that, as expected, participants in the mental contrasting condition increased their diabetes self-management by a larger extent than participants who merely indulged in the positive future.

A closer examination of the results revealed that mental contrasting was especially effective for promoting a healthy diet: the Time  $\times$  Condition interaction was significant for diet, but not for exercise self-management. However, when looking at the means for exercising, there are some reasons to suspect that the lack of significant effects for exercise self-management was probably due to a ceiling effect. Participants in both conditions exercised between 4 and 4.5 days a week in the follow-up period (but note that at baseline patients in the mental contrasting condition exercised approximately 0.6 times a week less than patients in the positive indulging condition). This is a lot, and probably even as much as can be expected from type 2 diabetes patients. In fact, the American Diabetes Association (2011)

recommends that type 2 diabetes patients engage in 150 min per week of moderate to vigorous exercise, which is equivalent to five days in which patients exercise 30 min (the item used in the DSCA is 'On how many of the past seven days did you engage in physical activity for at least 30 min?').

Taken together, our results thus indicate that to promote diabetes self-management (in particular sticking to one's diet), patients should not only focus on the positive outcomes of attaining these goals, but also make sure to mentally contrast these positive outcomes with obstacles in the present reality. The difference of engaging in these two modes of thoughts is only subtle, but yields quite different results: Patients who only indulge in the positive future are not able to increase their diabetes self-management, but patients who contrast this positive future with the present reality on average adhere to their diabetes self-management activities on 0.6 extra days per week compared to before the exercise.

The effect of mental contrasting on diabetes self-management activities is particularly noteworthy considering the fact that this is a minimalist self-regulation intervention that requires little input by a behavioural change agent, and that can thus be easily added to patients' standard care. Obviously, an intensive professionally guided intervention that incorporates a multitude of self-regulation strategies or behaviour change techniques could potentially yield much stronger effects. However, the objective of the present study was not to create a more effective intervention than those that are presently available, but rather a minimalist intervention that is inexpensive and easily administered and that results in meaningful changes in diabetes self-care.

However, the present findings are not only important from the perspective of providing a minimalist intervention that constitutes an easy to implement, cost-effective alternative to costly interventions when these are not available or feasible. The observation that mentally contrasting fantasies about a positive future with obstacles from the present reality results in better outcomes than positive fantasising alone also has important theoretical implications, in particular in light of the dominant positive psychology movement (e.g. Wood & Tarrrier, 2010; Rasumussen, Scheier, & Greenhouse, 2009; Duckworth, Steen, & Seligman, 2005; Seligman, 2002). According to many psychologists, to live a more fruitful, productive, and healthy life, or even to beat cancer or cope with chronic diseases, it is essential to keep a positive outlook (Aspinwall & Tedeschi, 2010). Our results, however, show, in line with previous findings by Oettingen and colleagues (e.g. Oettingen, 2000; Oettingen et al., 2001, 2009) and critics on positive psychology (Coyne & Tennen, 2010; Coyne, Tennen, & Ranchor, 2010; Gibson & Sanbonmatsu, 2004; Held, 2002; 2004), that although positive thinking may be good, to promote goal-attainment it is important not to overlook the barriers in the present reality.

A limitation of the present research is that only participants with strong expectations of success were included. This was done because mental contrasting is not expected to promote goal striving for individuals with low expectations of success. Rather, as mental contrasting promotes expectancy dependent, 'smart', goal striving, for these individuals contrasting the positive future with the negative reality is supposed to lead to reduced goal striving, and potentially even to goal disengagement. Although most type 2 diabetes patients generally have very high expectations of being able to control their disease through exercising and eating healthily (Thoolen, De Ridder, Bensing, & Rutten, 2008), still, for some patients a self-efficacy boosting intervention may thus be required before mental contrasting

may be beneficial. For example, patients could be provided with information in which it is emphasised that altering their eating (exercise) behaviour is relatively easy and in which opportunities for making healthy choices (exercising), as well as skills that may be helpful to make healthy food choices (engage in exercising) are listed (e.g. Van't Riet, Ruiters, Smerecnik, & de Vries, 2010).

A second limitation of the present research is that our measure of diabetes self-care activities, on which we found a significant difference for condition, is based on self-report. In the present study, no effects were found on objectively measured weight loss, but this was probably due to the relatively short time frame of the study. While the present results provide some first evidence that mental contrasting may be an effective strategy for promoting diabetes self-management activities, future research should thus be conducted to provide more conclusive evidence on whether these self-reported benefits for self-care are indeed predictive of weight loss on the long term. Moreover, future research could benefit from including more detailed measures of eating and exercise behaviour or ideally even diabetes specific outcomes such as blood glucose. Importantly however, it should be noted that self-management at follow-up was significantly related to weight loss, which strengthens confidence that the results for self-management are a valid indication of participants dieting and exercising behaviour. Moreover, the correlation between self-management at follow-up and weight loss confirms earlier findings that self-management activities are important to promote weight loss in diabetes patients.

A third limitation is the lack of a control group. In future research both of the intervention conditions should be compared to a control condition to see if there were any benefits to thinking about future positive outcomes compared to no intervention at all. Finally, it has to be noted that from the present data it cannot be discerned whether writing down the positive future and barriers from the present reality or mentally rehearsing these aspects was the active component of the intervention. In case mental contrasting would be incorporated in diabetes education programs or diabetes care regimens it would be wishful to first determine the optimal format of this procedure.

Although mental contrasting already yielded beneficial outcomes in this study, it should be noted that recent research has shown that mental contrasting can successfully be combined with the formation of implementation intentions to form an even more effective strategy than mental contrasting alone (e.g. Stadler et al., 2009, 2010). Implementation intentions are simple action plans that link good opportunities to act on one's goals to specific goal-directed actions (Gollwitzer, 1993, 1999). In case of combining mental contrasting with the formation of implementation intentions, these plans specify the barrier that was elaborated upon during mental contrasting and link these to a behaviour that is instrumental in dealing with this barrier. In doing so, execution of these behaviours becomes highly efficient as it no longer requires conscious effort or intent. Investigating the utility of this combined strategy for diabetes self-management seems like an important avenue for future research.

In conclusion, notwithstanding the above-outlined limitations, the present study is one of the first to successfully apply mental contrasting in the health domain (Oettingen, Mayer et al., 2010). Moreover, the present findings demonstrate for the first time that mental contrasting can be effectively used in a clinical sample in general, and to promote self-management activities in a sample of type 2 diabetes patients specifically. This is an important finding, as mental contrasting is

a self-regulation strategy that does not require much additional time or costs. Although a more comprehensive intervention that includes additional self-regulation strategies (i.e. implementation intentions) might be even more effective, the results of the present study indicate that merely asking patients to mentally contrast their weight loss wishes with obstacles, that stand in the way of realising their wishes, provides practitioners with a less costly, effective alternative that may be easily included on top of patient's usual care regimens.

## References

- American Diabetes Association (2011). Executive summary: Standards of medical care in diabetes – 2011. *Diabetes Care*, *34S*, S4–S10.
- Aspinwall, L.G., & Tedeschi, R.G. (2010). The value of positive psychology for health psychology: Progress and pitfalls in examining the relation of positive phenomena to health. *Annals of Behavioral Medicine*, *39*, 4–15.
- Coyne, C.C., & Tennen, H. (2010). Positive psychology in cancer care: Bad science, exaggerated claims, and unproven medicine. *Annals of Behavioral Medicine*, *39*, 16–26.
- Coyne, C.C., Tennen, H., & Ranchor, A.V. (2010). Positive psychology in cancer care: A story resistant to evidence. *Annals of Behavioral Medicine*, *39*, 35–42.
- Duckworth, A.L., Steen, T.A., & Seligman, M.E.P. (2005). Positive psychology in clinical practice. *Annual Review of Clinical Psychology*, *1*, 629–651.
- Gibson, B., & Sanbonmatsu, D.M. (2004). Optimism, pessimism, and gambling: The downside of optimism. *Personality and Social Psychology Bulletin*, *30*, 149–160.
- Fan, L., & Sidani, S. (2009). Effectiveness of diabetes self-management education intervention elements: A meta-analysis. *Canadian Journal of Diabetes*, *33*, 18–26.
- Gollwitzer, P.M. (1993). Goal achievement: The role of intentions. *European Review of Social Psychology*, *4*, 141–185.
- Gollwitzer, P.M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, *54*, 493–503.
- Hampson, S.E., Glasgow, R.E., & Toobert, D.J. (1990). Personal models of diabetes and their relations to self-care activities. *Health Psychology*, *9*, 632–646.
- Heine, R.J., & Stehouwe, C.D.A. (2001). Diabetes mellitus. In J. van der Meer & C.D.A. Stehouwer (Eds.), *Interne geneeskunde* (pp. 737–758). Houten/Diegem, the Netherlands: Bohn Stafleu van Loghum.
- Held, B.S. (2002). The tyranny of the positive attitude in America: Observation and speculation. *Journal of Clinical Psychology*, *58*, 965–992.
- Held, B.S. (2004). The negative side of positive psychology. *Journal of Humanistic Psychology*, *44*, 9–46.
- Norris, S.L., Engelgau, M.M., & Narayan, K.M.V. (2001). Effectiveness of self-management training in type 2 diabetes. *Diabetes Care*, *24*, 561–587.
- Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition*, *18*, 101–129.
- Oettingen, G., Hönig, G., & Gollwitzer, P.M. (2000). Effective self-regulation of goal attainment. *International Journal of Educational Research*, *33*, 705–732.
- Oettingen, G., Mayer, D., Sevincer, A.T., Stephens, E.J., Pak, H., & Hagenah, M. (2009). Mental contrasting and goal commitment: The mediating role of energization. *Personality and Social Psychology Bulletin*, *35*, 608–622.
- Oettingen, G., Mayer, D., & Thorpe, J. (2010). Self-regulation of commitment to reduce cigarette consumption: Mental contrasting of future and reality. *Psychology and Health*, *25*, 961–977.

- Oettingen, G., Pak, H., & Schnetter, K. (2001). Self-regulation of goal setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology*, *80*, 736–753.
- Oettingen, G., Stephens, E.J., Mayer, D., & Brinkmann, B. (2010). Mental contrasting and the self-regulation of helping relations. *Social Cognition*, *28*, 490–508.
- Rasumussen, H.N., Scheier, M.F., & Greenhouse, J.B. (2009). Optimism and physical health: A meta-analytic review. *Annals of Behavioral Medicine*, *37*, 239–256.
- RIVM (2006). *Hoe vaak komt diabetes mellitus voor en hoeveel mensen sterven eraan?* Retrieved from [www.rivm.nl/vtv/object\\_document/o1259n17502.html](http://www.rivm.nl/vtv/object_document/o1259n17502.html).
- Seligman, M.E.P. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. New York: Free Press.
- Stadler, G., Oettingen, G., & Gollwitzer, P.M. (2009). Physical activity in women: Effects of a self-regulation intervention. *American Journal of Preventive Medicine*, *36*, 29–34.
- Stadler, G., Oettingen, G., & Gollwitzer, P.M. (2010). Intervention effects of information and self-regulation on eating fruits and vegetables over two years. *Health Psychology*, *29*, 274–283.
- Taylor, S.E., Pham, L.B., Rivkin, I.D., & Armor, D.A. (1998). Harnessing the imagination: Mental simulation, self-regulation, and coping. *American Psychologist*, *53*, 429–439.
- Thoolen, B., De Ridder, D.T.D., Bensing, J., Gorter, K., & Rutten, G. (2008). Beyond good intentions: The development and evaluation of a proactive self-management course for patients recently diagnosed with type 2 diabetes. *Health Education Research*, *23*, 53–61.
- Thoolen, B.J., De Ridder, D., Bensing, J., Gorter, K., & Rutten, G. (2009). Beyond good intentions: The role of proactive coping in achieving sustained behavioural change in the context of diabetes management. *Psychology & Health*, *24*, 237–254.
- Thoolen, B.J., De Ridder, D.T.D., Bensing, J., & Rutten, G. (2008). No worries, no impact? A systematic review of emotional, cognitive and behavioral responses to the diagnosis of type 2 diabetes. *Health Psychology Review*, *2*, 65–93.
- Toobert, D.J., Hampson, S.E., & Glasgow, R.E. (2000). The summary of diabetes self-care activities measure. *Results from 7 studies and a revised scale*. *Diabetes Care*, *23*, 843–950.
- Van't Riet, J., Ruiter, R.A.C., Smerecnik, C., & De Vries, H. (2010). Examining the influence of self-efficacy on message-framing effects: Reducing salt consumption in the general population. *Basic and Applied Social Psychology*, *32*, 165–172.
- Wood, A.M., & Tarrier, N. (2010). Positive clinical psychology: A new vision and strategy for integrated research and practice. *Clinical Psychology Review*, *30*, 819–829.