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# Effects of a best-possible-self mental imagery exercise on mood and dysfunctional attitudes



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## ABSTRACT

Dispositional optimism has been related to positive physical and mental health outcomes, increased positive mood ratings and cognitions about the future. In order to determine the causal relation between optimism and mood and cognitions optimism should be manipulated experimentally. The current study tested the effects of a best-possible-self mental imagery exercise on affect and mood ratings and dysfunctional cognitions following a sad mood induction in undergraduate students ( $N=40$ ). Participants in the experimental condition wrote about their best possible self in the future for 15 min and engaged in a mental imagery task about their best possible self in the future for 5 min in order to experimentally induce optimism. Participants in the control condition wrote about a typical day for 15 min and engaged in mental imagery about a typical day for 5 min. We assessed affect, mood and dysfunctional cognitions before and after the experimental manipulation. Participants in the experimental condition had higher positive mood ratings and higher positive affect compared to participants in the control condition. Participants in the control condition reported decreased dysfunctional cognitions whereas dysfunctional cognitions in the experimental group remained unchanged. Future studies should replicate these findings in clinical groups with more profound levels of negative affect and dysfunctional cognitions.

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## 1. Introduction

Cognitive theories of depression emphasize the role of dysfunctional cognitive processing in the development and maintenance of depression (Beck, 1964; Abramson et al., 1978). In Beck's cognitive model of depression, negative beliefs about the self, the world, and the future are at the core of depression, whereas the reformulated learned helplessness theory emphasizes the importance of a pessimistic attributional style, defined as interpreting negative events as internal, stable, and global. Numerous studies have shown that depressed individuals are characterized by increased dysfunctional attitudes (Haaga et al., 1991), whereas relatively fewer studies have investigated the impact of positive biases such as increased optimism about the future (Taylor and Brown, 1988) on mood and dysfunctional cognitions.

Optimism can be defined as a tendency for generalized positive outcome expectancies in the future (Carver et al., 2010). Previous studies have established positive relations between optimism and physical and mental health outcomes (Segerstrom et al., 1998; Taylor et al., 2000; Rasmussen et al., 2009). For example, Segerstrom et al. (1998) found that dispositional and situational

optimism was related to more positive mood ratings and more positive immune parameters in college students. Moreover, longitudinal studies have shown that increased optimism is related to a lower incidence of depression symptoms (Giltay et al., 2006).

While these studies suggest that there is a positive relation between optimism and mental and physical health, the correlational design of these studies does not allow for any causal interpretations of the relation between optimism and outcomes. In order to establish a causal relation optimism needs to be manipulated experimentally. It has been shown previously that the vividness of positive mental imagery of the future is associated with optimism, suggesting that imagery exercises are a powerful way to increase optimism and thereby mental wellbeing (Blackwell et al., 2013). In line with this, previous experimental studies that used imagery exercises to induce optimism found that imagery of positive future events indeed increased optimism and positive mood ratings (Sheldon and Lyubomirsky, 2006; Peters et al., 2010; Meevissen et al., 2011). Moreover, one previous study has shown that a negative mood induction decreases optimism in women, suggesting that the relation between mood and optimism is bi-directional (Lewis et al., 1995). Meevissen et al. (2011) investigated the effects of daily practicing a positive future imagery exercise over a period of 2 weeks on participants' mood. In this study participants were instructed to imagine themselves in the future when everything has turned out in the best possible

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way. It was shown that the imagery exercise led to increased optimism already after the first session and at the 2 week follow-up assessment (Meevissen et al., 2011).

While previous studies suggest that optimism has a positive effect on mood, the impact of optimism on negative cognitions remains unclear. One way to study the impact of optimism on dysfunctional cognitions in healthy participants is to trigger dysfunctional cognitions by means of a negative mood induction paradigm. Previous studies have shown that mood induction paradigms reliably increase negative mood (Martin, 1990) and trigger dysfunctional thinking patterns in people vulnerable for depression (Miranda et al., 1990; Scher et al., 2005). Yet, to the best of the authors' knowledge, no published study to date has addressed the impact of optimism on mood or dysfunctional attitudes following a sad mood induction procedure. Thus while previous studies have shown that optimism has an effect on positive affect (e.g., Peters et al., 2010), it remains unclear whether optimism can reinstate positive affect following a sad mood induction.

The aims of the current study were to replicate and extend previous findings by studying the effects of a best-possible-self (BPS) mental imagery exercise on affect, mood and dysfunctional cognitions in healthy participants that were experimentally set into a negative mood state. Previous studies have already shown that the BPS exercise reliably increases optimism (Peters et al., 2010; Meevissen et al., 2011; Hanssen et al., 2013; Peters et al., 2013). To the best of the authors' knowledge the current study is the first to test the effects of the BPS exercise on the reinstatement of positive affect, mood and dysfunctional attitudes following a sad mood induction. We hypothesized that (1) following a sad mood induction, participants in the BPS condition would report higher levels of positive affect/mood and lower levels of negative affect/mood compared to participants in the control condition. Moreover, we hypothesized that (2) following a negative mood induction, participants in the BPS condition report lower levels of dysfunctional attitudes, compared to participants in the control condition, as measured by the dependency and perfectionism subscales as well as by the total score of the Dysfunctional Attitudes Scale.

## 2. Methods

### 2.1. Participants

Participants were forty undergraduate students from Maastricht University (32 women, eight men; age range 19–38 years,  $M=22.1$ ). The study protocol was approved by the local ethics committee and all participants included in the study provided written informed consent.

### 2.2. Materials

#### 2.2.1. Dysfunctional Attitude Scale (DAS)

The DAS (Weissman and Beck, 1978) is a 40-item self-report questionnaire designed to measure dysfunctional attitudes on a 7 point scale ranging from 1 = "fully disagree" to 7 = "fully agree". For each statement, participants are asked to indicate in how far they agree with that statement in general. In the present study an abbreviated, 17-item version of the DAS (de Graaf et al., 2009) was used that measures dysfunctional attitudes along two subscales: perfectionism and dependency. An example of a perfectionism item is "If I do not do well all the time, people will not respect me" (item 4 of the original 40-item DAS). An example of a dependency item is "My value as a person depends greatly on what others think of me" (item 19 of the original 40-item DAS). The perfectionism subscale has 11 items with scores ranging from 11–77 and the dependency subscale has six items with scores ranging from 6 to 42. In the present study the scale was adapted to a 100 mm Visual Analog Scale (VAS) to prevent memory effects during repeated administration. Good scale score reliability (coefficient alpha=0.91) and convergent validity of the DAS-17 has been reported (de Graaf et al., 2009). In the current study reliability coefficient alpha was 0.81 for the perfectionism subscale and 0.77 for the dependency subscale.

#### 2.2.2. Positive and Negative Affect Schedule (PANAS)

The PANAS (Watson et al., 1988) consists of 10 positive and 10 negative adjectives that are rated on a Likert-Type scale. In the current study the Dutch version of the PANAS was used (Engelen et al., 2006) and the scale was adapted to a 100 mm VAS to prevent memory effects during repeated administration. Participants were asked to rate the degree to which they feel at this specific moment for each item on a VAS scale ranging from "very slightly or not at all" to "extremely". We used the state version of the PANAS. The specific instructions that the participant received were "Please indicate how you feel at this specific moment." In the present study reliability coefficient alpha was 0.85 for the positive affect scale and 0.91 for the negative affect scale.

#### 2.2.3. Mood scales

VAS were used to measure current mood state of participants. The four mood scales measured mood on a bipolar continuum between positive and negative, dull and glad, anxious and secure, and happy and sad. Participants rated their relative position between each of these pairs on a 100 mm scale. These four scales were chosen in order to capture broader aspects of positive and negative mood states.

#### 2.2.4. Negative mood induction

The negative mood induction consisted of mood suggestive music ("Adagio for Strings" by Samuel Barber) in combination with autobiographical recall. All participants were instructed to recall a sad event from their lives while listening to the music via a headphone for 10 min. During the mood induction procedure the experimenter was sitting behind a room divider and was not visible to the participant. Mood suggestive music in combination with autobiographical recall is a reliable method to induce short lasting negative mood states (Martin, 1990).

*Best-possible-self imagery exercise.* In order to experimentally manipulate optimism we used a mental imagery task that has previously been validated as an effective paradigm to manipulate optimism (Peters et al., 2010). Participants in the experimental condition were instructed to imagine their BPS in the future whereas participants in the control condition were instructed to imagine a typical day. In both conditions participants were first instructed to think about the task for one minute. Then participants in the experimental condition were asked to write about their BPS for 15 min whereas participants in the control condition were asked to write about a typical day for 15 min. In both groups participants were instructed to keep writing and if necessary repeat what they already wrote. Finally, participants were asked to engage in mental imagery about their best possible self in the future/a typical day for 5 min. Participants were explicitly instructed to visualize their mental image as vividly as possible and with as much detail as possible. A more detailed description of the optimism induction paradigm and the specific instructions are provided by Sheldon and Lyubomirsky (2006) and by Peters et al. (2010).

### 2.3. Procedure

Participants who responded to written advertisements of the study were invited to a behavioral lab at the University and randomly assigned to either the optimism condition or to the control condition. After informed consent participants completed the first set of the PANAS and the mood scales. After completion of these questionnaires, all participants received the negative mood induction consisting of mood suggestive music in combination with autobiographical recall for 10 min. Following the negative mood induction participants again completed the PANAS and the mood scales as well as the DAS. Next the experimental manipulation was conducted. Participants in the experimental condition received the BPS instructions whereas participants in the control condition received the instructions for the control condition. Following the experimental manipulation, the PANAS, mood scales and DAS were again administered. At the end of the experiment participants received a gift voucher of 7.50 Euro.

### 2.4. Statistical analyses

Paired sample *t*-tests were used to determine the effect of the mood induction (manipulation check). Moreover, we conducted a repeated measures ANOVA on the affect/mood scales with time as within group factor (pre-mood induction to post-mood induction) and condition as between group factor. The purpose of these analyses was to determine whether the mood induction had a similar impact on mood and affect in the two conditions. To determine the effect of the BPS exercise on positive and negative affect (hypothesis 1), two one-way ANOVAs with the positive and negative affect change score as dependent variables and condition as a between-subjects factor were conducted. The same analyses were conducted with the mood scales as dependent variable. To determine the effect of the BPS exercise on dysfunctional attitudes three one-way ANOVAs with the dependency and perfectionism subscales and the DAS total score as dependent variable and condition as between subject factor were conducted.

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