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# The Relationship between Rumination, Positive Future Goals and Cognitive Aspects of Future Goals as Predictors of Depression

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**Abstract**

This study investigated the role of rumination and positive future goals in predicting symptoms of depression in a clinical sample. First, associations of two aspects of rumination, i.e. brooding and reflection, with depression were tested. Secondly, a mediational model was tested that proposed that the relationship between rumination and depression is mediated by number of positive future goals formulated, perceived control over goal achievement and perceived likelihood of goal achievement. A sample of  $N = 200$  patients with depression was recruited from an outpatient mental healthcare clinic. The results showed that brooding, but not reflection, predicted depressive symptoms. Not all aspects of positive future goals were found to be predictors of depression; only perceived control over goal achievement was a mediator of the relationship between brooding and depression. Patients who engaged in brooding tended to perceive future goals as less controllable and experienced more symptoms of depression. Strategies to increase the subjective experience of control over achievement of future goals are a potential target for psychological treatment of depression. Limitations of the current study, suggestions for future research and implications of these findings for clinical practice were discussed.

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## 1. Introduction

In the Netherlands, 18.7 percent of the adult population suffers from depression over the course of their lives, making depression one of the main health problems in the Netherlands (De Graaf, Ten Have, & Van Dorsselaer, 2010). Depression has severe consequences for quality of life, such as reduced well-being, occupational and social disability (Spijker, De Graaf, Bijl, Beekman, Ormel, & Nolen, 2004). Depressive disorders are responsible for high economic costs for society in terms of reduced productivity caused by depression and the costs of treatment (Cuijpers, Beekman, & Reynolds, 2012). In order to develop and improve effective methods of treating depression, it is valuable to gain more insight into the mechanisms that cause and/or maintain depressive symptoms. Over the past decades, vulnerability factors and causal mechanisms of depression have been the subject of extensive research. Of these, rumination has received considerable attention.

Rumination has been conceptualized as a response style characterized by repetitive self-focused thoughts about negative feelings and their causes and/or consequences (Lyubomirsky & Nolen-Hoeksema, 1993). The content of ruminative thinking usually involves themes such as failure to achieve personal goals. Depressive patients often believe that rumination helps them find answers to solve their problems and prevent future mistakes and failures (Papageorgiou & Wells, 2001; Watkins & Moulds, 2005). However, research has shown that the tendency to ruminate on depressive feelings does not lead to understanding of the symptoms, but instead increases negative mood (Nolen-Hoeksema, 1991). A ruminative response style is linked to increased occurrence of depressive episodes and a longer duration of depressive episodes (Watkins, 2008; Thomsen, 2006). Not all types of rumination are associated with increased negative mood. Research using the Ruminative Response Scale (RRS), a widely used self-report measure of rumination, has found evidence to support a two-dimensional model of rumination. In this model, rumination is divided into two subcomponents, namely brooding and reflection (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Brooding is described as the process of passively comparing the current situation to unachieved standards, without thinking about possibilities to change the current situation. Reflection refers to deliberately looking inward and engaging in cognitive problem solving to reduce depressive symptoms (Schoofs, Hermans, & Raes, 2010). Burwell and Shirk (2007) studied an adolescent sample and found that, of the two components, brooding was relatively more maladaptive than reflection. In their study, brooding was related to both the current and future presence of depressive symptoms. Reflection was also related to present depressive

symptomatology, although the relationship was weaker than for brooding. Reflection was not related to the occurrence of depressive symptoms longitudinally. Important to note is that the tendency to ruminate on negative feelings appears to persist even after recovery from the depressive disorder (Nolen-Hoeksema & Davis, 1999). Rumination thus appears to be a trait rather than a state characteristic, suggesting that it is more likely to be a vulnerability factor in the etiology of depressive symptoms, rather than a consequence of the depressed mood.

In addition to rumination, positive future-thinking is known to be reduced in people suffering from depression and is considered an important aspect of depression (Abramson, Alloy, & Metalsky, 1989). Reduced positive future-thinking can take different forms: less anticipation of positive experiences or more anticipation of negative experiences. The latter is generally seen in people suffering from anxiety symptoms, whereas a reduction in positive expectations for the future is more characteristic of people suffering from depression (MacLeod, Tata, Kentish, & Jacobsen, 1997). There are multiple explanatory theories on the reduction in positive future-thinking found in depression. The first is that, because of the incongruence with their current negative mood, it is difficult for people suffering from depression to access mental information related to positive future experiences (MacLeod & Salaminiou, 2001). Research in healthy individuals has found reduced fluency in generating positive future events after participants received a negative mood induction. Mood-incongruent events were also perceived as being more negative by participants who received a negative mood induction, suggesting that this cognitive bias is not unique to depression but also occurs in healthy individuals (Hepburn, Barnhofer, & Williams, 2006).

An alternative explanation is that individuals with depression often experience anhedonia, an inability to experience pleasure from activities that would normally be considered enjoyable. This can cause a reduction in positive future-thinking as possible future experiences might not be considered pleasurable in the mind of the currently depressed individual. It is likely that the reduction in positive future-thinking is a maintaining factor of depression. Thinking about positive future events is often needed to plan future experiences. Reduced positive future thinking can also reduce the number of positive events the depressed individual experiences (MacLeod & Salaminiou, 2001).

An important aspect of positive future-thinking is the ability to formulate goals and plans for the future. Goals for the future provide meaning and direction in life and can serve as a framework for interpreting life experiences (Schmuck & Sheldon, 2001). In the learned helplessness theory as well as the hopelessness theory of depression, the perception of future

outcomes as being uncontrollable by the individual plays a central role in the etiology and maintenance of depressive symptoms (Abramson, Seligman, & Teasdale, 1978; Abramson et al., 1989). Vincent, Boddana and MacLeod (2004) developed a measure to assess these positive future goals and cognitions related to those goals, such as perceived control and perceived likelihood of achievement. They conducted a study among parasuicidal individuals and a matched control group, designed to examine the ability to think of positive future goals and cognitions related to goal achievement. In this study, they found that parasuicidal individuals generated less specific future goals. Additionally, parasuicidal individuals gave lower ratings of perceived control and perceived likelihood of achieving those goals compared to the matched control group. The cognitions related to achieving positive future goals appear to be especially important. Further research on future goals showed that depressed individuals did not differ from non-depressed controls on the number of positive future goals they generated. However, they gave significantly lower ratings of their perceived control over these goals and were more pessimistic about the likelihood of achieving those goals (Dickson, Moberly, & Kinderman, 2011).

In multiple studies, rumination has been found to increase both negative mood and the cognitive biases that occur in depression (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Nolen-Hoeksema & Morrow, 1993; Watkins, Teasdale, & Williams, 2000). Considering that reduced positive future-thinking is an important cognitive factor in the etiology and maintenance of depression and that rumination influences both negative mood and cognitive processes, it is likely that rumination influences future-thinking in depression. However, the relationship between these two factors in affecting depressive symptoms has received little attention in research so far. Lavender and Watkins (2004) explored the relationship between rumination and future thinking in depressed patients. In their experimental study, they predicted that depressed patients induced to ruminate on negative feelings would generate less positive future events compared to patients induced to distract. However, they found that patients induced to ruminate generated more negative future events as well as positive future events compared to patients induced to distract. This finding could be explained by the theory that self-focused rumination activates self-related schemas (Andersen & Limpert, 2001). The authors argue that, for people with depression, negative future-event schemas are more elaborated and accessible than positive future-event schemas. However, they propose that rumination may activate self-related information in general more than distraction, and that this self-related information in turn aids the generation of possible positive future events

(Lavender & Watkins, 2004). It should be noted, however, that by experimentally inducing rumination, this study focused on state rumination. Research has shown that the trait tendency to ruminate more than state rumination is a vulnerability factor in the development of a depressive disorder (Spasojevic & Alloy, 2001).

The present study aimed to build on the existing knowledge by examining whether the relationship between ruminative thinking and depression is mediated by positive future-thinking. More specifically, this study investigated the role of formulations of positive future goals and the perceived controllability and likelihood of achieving those goals in the relationship between rumination and depression. Firstly, the association between rumination and depression was examined. Based on literature that brooding is more maladaptive than reflection, it was hypothesized that brooding, but not reflection, predicts depression severity (Schoofs et al., 2010; Treynor et al., 2003). Based on the finding that rumination enhances negative mood and cognitive biases, it was expected that patients with a stronger tendency to ruminate would generate less positive future goals and perceive these goals as being less controllable and likely to achieve, which in turn was expected to be related to severity of depression (Dickson et al., 2011; Nolen-Hoeksema et al., 1993; Watkins et al., 2000; Lyubomirsky et al., 1998). Based on the results from the study by Dickson et al. (2011), it was expected that the cognitive aspects of future goals, perceived control and perceived likelihood of achievement, are relatively more important in predicting depression than the number of goals formulated. The overarching aim of this study was to increase understanding of cognitive processes involved in depression that might maintain the disorder and therefore could be targeted in treatment.

## **2. Method**

### *2.1. Participants*

Participants were patients of an Altrecht outpatient clinic specialized in the treatment of depression. After the intake procedure, all patients starting treatment for depression were asked to participate in the current study. A total of 200 patients volunteered to participate, 89 male and 111 female ranging in age from 23 to 63 years ( $M = 40.42$ ,  $SD = 10.23$ ). The mean age of the male patients was 42.13 years ( $SD = 10.11$ , range = 23-63), the mean age of the female patients was 39.05 years ( $SD = 10.15$ , range = 23-60). Level of education ranged from primary school to university, as presented in *Table 1*. Exclusion criteria were language

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barriers, low intelligence and a mental health state that was too severe to be able to participate in the study. Patients included met criteria for a depressive disorder according to the DSM-IV-TR (APA, 2007), determined using a non-structured interview, with variations in severity and number of episodes, as presented in *Table 2*.

Table 1. *Socio-demographic characteristics of the sample (n = 200).*

Highest completed education level	% Sample
Primary school	9.0%
LTS/LBO	11.5%
MAVO/VMBO	17.0%
MBO	36.5%
HAVO/VWO	9.5%
HBO/University	15.0%
Other	1.5%

Table 2. *Depression symptom severity and number of episodes in the sample (n = 200).*

Symptom severity	% Sample
Light	6.5%
Moderate	34.5%
Severe	59.0%
Course of depression	% Sample
First episode	26.0%
Second episode	10.5%
>2 episodes or chronic depression	63.5%

## 2.2. Measures

### 2.2.1. Inventory of Depressive Symptomatology – Self-report (*Zelfinvullijst Depressieve Symptomen; IDS-SR-NL 30*)

The IDS-SR is a self-report measure of depressive signs and symptoms developed by Rush et al. (1986). The IDS-SR contains 30 equally weighed items designed to measure specific symptoms of major depressive disorders as described in the Diagnostic and Statistical Manual

of Mental Disorders, Fourth Edition (DSM-IV). Items are rated on a scale of 0 to 3 and summed in a total score ranging from 0 to 84, in which a higher score corresponds to higher symptom severity. Only 28 items contribute to the total scores, as changes in weight and appetite are rated on increase *or* decrease. Psychometric evaluation of the IDS-SR using a  $N = 337$  sample of adult outpatients with a current depressive disorder and a  $N = 118$  sample of subjects with remitted depression and normal controls showed good internal consistency. Cronbach's alpha was .93 in the total sample (Rush, Gullion, Basco, & Jarrett, 1996). In the current sample, Cronbach's alpha was .87, which is considered good for research purposes (George & Mallery, 2003). The IDS-SR is useful in detecting symptom change, residual symptoms in patients recovering from depression and can be used to evaluate symptom severity (Rush, Carmody, & Reimitz, 2000).

### 2.2.2. *Ruminative Response Scale (RRS-NL)*

The Dutch translation of the *Ruminative Response Scale (RRS-NL)* is a self-report questionnaire that assesses responses to depressed mood, such as ruminating on the causes and/or consequences of depressed mood. It includes 10 items that are rated on a 4-point likert scale ranging from 'almost never' to 'almost always' (Raes, Hermans, & Eelen, 2003). Treynor et al. (2003) identified two subscales, *brooding* and *reflection*, consisting of 5 items each. Cronbach's alpha was .78 for the brooding subscale and .75 for the reflection subscale in an  $N = 432$  student sample (Schoofs et al., 2010). In the current sample, internal consistency of the reflection subscale was acceptable,  $\alpha = .76$ . Internal consistency was questionable for the brooding subscale,  $\alpha = .60$  (George & Mallery, 2003).

### 2.2.3. *Measure to Elicit Positive Future Goals and Plans (MEPGAP)*

The MEPGAP is a semi-structured interview developed by Vincent et al. (2004) to elicit information about an individual's ability to generate future positive life goals. Participants are first given an open-ended cue to generate as many positive goals for the future as they can for one minute. After this, participants are asked to formulate goals in relation to seven different life domains: home life, work/education, finances, social life, close relationships, health/fitness and emotional well-being. Following the identification of positive goals, participants select the six most important goals and rate the controllability and likelihood of achievement of these goals. Controllability is rated on a scale of 1 ('not at all within my control') to 7 ('completely within my control'). Likelihood is rated on a similar scale of 1



(‘highly unlikely’) to 7 (‘certain’). The number of goals is scored in total and for each of the seven life domains. Information concerning the psychometric qualities has not been found.

### 2.3. Procedure

All patients starting treatment for a depressive disorder were asked to participate in the current study. The current study was performed as part of a specialized depression assessment (coined “*Gespecialiseerd Depressie Assessment*”; GDA). During the appointment, the aim of the current study was briefly explained and participants provided written informed consent. First, a semi-structured interview on depression staging and profiling information was conducted, followed by the MEPGAP. Then, participants were asked to complete a number of pen-and-paper questionnaires, including the RRS-NL and IDS-SR-NL. Completion of the GDA took one to one and a half hours on average. For each individual participant, a brief report concerning the GDA results was included in the electronic patient’s file to provide the therapist with additional information about the client. Therefore, the GDA provided information for research purposes as well as clinical practice.

### 2.4. Design and statistical analyses

The current study used a cross-sectional, correlational design to assess the relationship between the brooding and reflection subtypes of rumination, positive future goals, controllability over goals, likelihood of goal achievement and depression severity. Statistical analyses were performed using IBM SPSS Statistics 22.0. To test the hypothesis that brooding, but not reflection, predicts depression symptoms, a multiple regression analysis was conducted with IDS-SR scores as the dependent variable and brooding and reflection as independent variables. A regression analyses was preferred over correlations as regression can be used to control for the overlap between aspects of rumination: brooding and reflection. Prior to testing the hypothesized mediational model, Pearson correlations were calculated for the associations between each of the predictor variables and depression scores in the IDS-SR. Mediational analyses were performed using an add-on procedure named “Process”, version 2.16, developed by Hayes (2012). Independent variables were brooding and rumination scores, the dependent variable was severity of depressive symptoms. Positive future goals were hypothesized to mediate the relationship between rumination and depression and were divided into three mediating variables: number of goals, controllability and likelihood of achievement.

### 3. Results

#### 3.1. Data inspection

Prior to testing the hypotheses, potential outliers were identified by exploring extreme values in the data using stem-and-leaf plots. There were no outliers in the data that needed to be removed. The histogram of standardized residuals and the normal P-P plot of standardized residuals indicated that the assumption of normally distributed errors was met. The scatterplot of standardised residuals showed that independence of errors, homoscedasticity and linearity were not a cause for concern.

#### 3.2. Sample characteristics

The mean score on the RRS-NL was 2.88 ( $SD = .65$ ) for brooding and 2.23 ( $SD = .61$ ) for reflection. Mean scores for both scales ranged from 1.00 to 4.00. The total number of goals generated by participants ranged from 0 to 34,  $M = 11.71$ ,  $SD = 6.04$ . Perceived control over goal achievement ranged from 1 to 7, with a mean score of 3.31 ( $SD = 1.51$ ). Perceived likelihood of goal achievement ranged from 1 to 7, with a mean score of 3.94 ( $SD = 1.41$ ). Depression symptoms as reported on the IDS-SR ranged from 1 to 74, with a mean score of 44.95 ( $SD = 13.46$ ). This score represents the presence of severe symptoms of a depressive disorder as studied in a psychometric evaluation in a chronically depressed participant group (Rush et al., 2003). A Pearson correlation showed that there was a significant correlation between brooding and reflection,  $r = .36$ ,  $p < .001$ .

#### 3.3. Regression analysis of brooding and reflection as predictors of depression scores

The assumption of error independence was met, *Durbin-Watson* = 2.003. Multicollinearity was not a cause of concern, *Tolerance* = .87, *VIF* = 1.15. A significant regression equation was found,  $F(2, 194) = 12.06$ ,  $p < .001$ ,  $R^2 = .11$ . Consistent with the hypotheses, brooding was found to significantly predict depression,  $\beta = .346$ ,  $p < .001$ . Depression scores were not predicted by reflection,  $\beta = -.045$ ,  $p = .53$ .

#### 3.4. Correlations

Results of a Pearson correlation matrix including all variables relevant for the analyses are presented in *Table 3*. A significant positive correlation was found between brooding and depression,  $r = .33$ ,  $p < .001$ . Number of future goals was not correlated with depression,  $r = -.08$ ,  $p = .29$ . Perceived control over goals was negatively correlated with depression scores,  $r$

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= -.54,  $p < .001$ . Similarly, perceived likelihood of goal achievement was negatively correlated with depression scores,  $r = -.36$ ,  $p < .001$ .

Table 3. *Correlation matrix RRS brooding, RRS reflection, IDS-SR, number of positive future goals, perceived control and perceived likelihood of achievement*

	1	2	3	4	5	6
1. RRS brooding	-					
2. RRS reflection	.361*	-				
3. IDS-SR-NL	.330*	.079	-			
4. Number of goals	.096	.124	-.075	-		
5. Perceived control	-.151*	.114	-.540*	.235*	-	
6. Perceived likelihood	-.063	.076	-.363*	.249*	.555*	-

Note: 1 and 2: RRS = Ruminative Response Scale, 3: IDS-SR-NL = Inventory of Depressive Symptomatology Self-Report, Dutch translation, 4: Total number of goals formulated on the MEPGAP (Measure to Elicit Positive Goals and Plans), 5: Mean perceived control over achievement of goals formulated on the MEPGAP, 6: Mean perceived likelihood of achievement of goals formulated on the MEPGAP.

\* correlation is significant,  $p < .05$ .

### 3.5. Mediation analyses

Considering that reflection was not found to significantly predict depression scores, the mediational model was only conducted using brooding as an independent variable. First, a series of simple mediational analyses were conducted for each of the hypothesized mediators. As could be expected based on the finding of no significant correlation between number of goals and depression, no indirect effect of brooding on depression scores through number of positive future goals was found,  $b = -.28$ , 95%  $CI [-1.000, 0.062]$ . Perceived control over goal achievement was found to be a mediator of the relationship between brooding and depression,  $b = 1.55$ , 95%  $CI [0.005, 3.424]$ . No indirect effect of perceived likelihood of achievement on depression scores was found,  $b = .45$ , 95%  $CI [-.571, 1.666]$ . Second, a multiple mediation analysis was conducted that simultaneously examined the mediating effects of the three hypothesized variables. No unique indirect effects were found of brooding on depression through either number of goals, perceived control over goal achievement or perceived likelihood of achievement.

### 3.6. Additional analyses

The performed analyses revealed associations between positive future goals variables and depression scores. Perceived control was found to mediate the relationship between brooding and depression, however the hypothesized indirect effects of total number of positive future goals and perceived likelihood of achievement were not confirmed. This gave rise to the idea that depression could possibly be predicted directly by number of goals, perceived control and perceived likelihood of achievement. Accordingly, in addition to the mediational analyses and correlations that were performed, a multiple regression analysis was conducted to examine the direct effects of future goals, perceived control and perceived likelihood of achievement on depression. The Durbin-Watson test showed that the assumption of independent errors was met, *Durbin-Watson* = 2.19. Multicollinearity tests showed that this was not a cause of concern for number of future goals (*Tolerance* = .92, *VIF* = 1.08), perceived control over goals (*Tolerance* = .68, *VIF* = 1.47) and for perceived likelihood of achievement (*Tolerance* = .68, *VIF* = 1.48). A significant regression equation was found,  $F(3, 194) = 27.65, p < .001, R^2 = .30$ . Depression scores were not predicted by number of future goals,  $\beta = .083, p = .19$ . Perceived control over goal achievement significantly predicted depression,  $\beta = -.49, p < .001$ . Depression scores were not predicted by perceived likelihood of goal achievement,  $\beta = -.11, p = .14$ .

## 4. Discussion

In an effort to further clarify the relationship between rumination, positive future thinking and depression, the present study focused on two main research questions, the first concerning the relationship between rumination and depression. Treynor et al. (2003) and Schoofs et al. (2010) proposed two subcomponents of rumination, brooding and reflection, of which brooding was described as relatively more maladaptive. The hypothesis that brooding, but not reflection, predicts depression severity was supported by our data. Consistent with earlier research, participants who reported a higher tendency to engage in brooding also reported more symptoms of depression (Burwell & Shirk, 2007; Treynor et al., 2003; Schoofs et al., 2010). In addition to previous research, the results in the current study further confirm this distinction in a clinically depressed patient sample.

The second and main research question in this study concerned the role of positive future goals in the relationship between brooding and depression. The relationship between

rumination and positive future thinking in predicting symptoms of depression has not received much attention in previous research. Based on the theoretical background on rumination, positive future goals and depression, a mediational model was proposed in which an indirect effect of brooding on depression symptoms through positive future goals was hypothesized (Nolen-Hoeksema et al., 1993; Watkins et al., 2000; Lyubomirsky et al., 1998). Three aspects of positive future goals were examined: number of goals, perceived control over goal achievement and perceived likelihood of achievement. In line with research from Dickson et al. (2011), cognitive aspects of positive future goals, perceived control and likelihood of achievement, were expected to be more important in predicting depression symptoms than the number of goals formulated.

The proposed mediational model was not fully supported by the data. The results showed that perceived control over goal achievement was indeed a mediator of the relationship between brooding and depression, but number of positive future goals formulated and perceived likelihood of achievement were not. In part, this is consistent with the hypothesis that cognitive aspects of positive future goals are important predictors of depression symptoms, however this was only found for perceived control and not for perceived likelihood of achievement. In this study, patients who tend to engage in brooding behavior, perceive the achievement of positive future goals as less controllable and experience more symptoms of depression. Schoofs et al. (2010) described brooding as the passive process of comparing the current situation with unachieved standards, without considering possibilities for change. Earlier research has found that brooding and reflection are associated with different coping strategies. In line with the definition by Schoofs et al. (2013), brooding was related to passive coping strategies such as avoidance, fleeing and denial. Reflection was associated with adaptive coping strategies such as active problem-solving (Burwell et al., 2007). These findings point at the process of cognitive problem-solving as a possible explanation of the role of perceived control over goals on the relationship between brooding and depression. Earlier research has shown that people who engage in dysphoric rumination generate less effective solutions to interpersonal problems (Lyubomirsky & Nolen-Hoeksema, 1995). While this study uses experimentally induced state rumination and a problem-solving task, it does show a relationship between rumination and impaired problem-solving. These results were replicated by Watkins and Baracaia (2002). In these studies, rumination was not differentiated into brooding and reflection. However, since brooding is a passive cognitive process that is not characterized by considering ways to

change the current situation, it can be assumed that this more maladaptive component of rumination is more likely to be related to impaired cognitive problem-solving strategies. Possibly, this impairment in problem-solving strategies may prevent the individual from thinking of constructive actions to achieve future goals and therefore increase the perception that potential future events are uncontrollable.

In the past decades, the relationships between goal-setting and depression have been a frequent subject of research (Street, 2002). The present study adds to this knowledge through further specifying the importance of perceived control in relation to brooding and depression. Past research specifically linked the trait tendency to ruminate to depression, which was confirmed by the present study (Ciesla & Roberts, 2007; Moulds, Kandris, Starr, & Wong, 2007; Nolen-Hoeksema & Davis, 1999). This trait tendency to ruminate generally tends to persist after recovering from depression. Since trait tendencies such as rumination are generally resistant to change, positive future goals, specifically perceived control over goal achievement, could be a more useful target in the treatment of depression. Possibly, increasing perceived control over the achievement of future goals can prevent people from developing depressed symptoms as a result of brooding on their current situation. The implementation of strategies to increase perceived control into psychological treatment of depression could therefore be beneficial. Perceived control over goal achievement could possibly be targeted directly through cognitive interventions. Cognitive-behavioral therapy (CBT) is the most studied psychotherapeutic intervention used in the treatment of depression and its effectiveness has been demonstrated in a large number of studies (Cuijpers, Berking, Andersson, Quigley, Kleiboer, & Dobson, 2013). In CBT, the aim is to evaluate, challenge and modify dysfunctional beliefs. This core element of the treatment is also referred to as cognitive restructuring (Cuijpers, Andersson, & Van Oppen, 2008). Possibly, cognitive restructuring aimed at maladaptive cognitions such as not being in control over goal achievement, could modify these cognitions and therefore increase perceived control. A second possibility is to target perceived control indirectly. Speculatively, perceived control could be increased by teaching patients ways to take constructive action to achieve goals and encourage them to take these steps. This might fit into the framework of behavioral treatments of depression. Past research has found that interventions focused on behavior, such as activity scheduling, are effective in treatment of depression (Cuijpers, Van Straten, & Warmerdam, 2007). Applying activity scheduling methods to goal-setting, such as breaking goals into sub goals and planning actions to work towards goal achievement, might increase the experience

of control over goal achievement. Future research is needed to explore methods to implement this aspect of future-thinking into the treatment of depression and determine their efficacy.

There are a number of limitations to the current study. Firstly, it is important to consider the key limitation of using a cross-sectional study design. The current study hypothesized a causal relationship between rumination as a predictor of depression based on insights from previous research. However, trait rumination, depression and positive future goals were assessed at the same time. Because of this, the study does not pose evidence for the temporal order or direction of the relationship between brooding, positive future goals and depression. Future research using an experimental or longitudinal design is needed to determine the direction of the relationship. A second limitation of the present study is the use of the MEPGAP (Vincent et al., 2004) as a measure for assessing positive future goals, perceived control and perceived likelihood of achievement. The standardization of this instrument was likely limited and, to our knowledge, its reliability has not been evaluated using interrater reliability estimation or other methods. Therefore, the administration of this semi-structured interview could have been susceptible to experimenter differences such as asking additional questions during administration, that possibly influenced the answers of the patients. There is also little information on the reliability and validity of this interview. Efforts to further standardize the instrument are needed to ensure its reliability and validity as a measure of future goals. Lastly, the results in the present study could be influenced by the participant sample. Although the naturalistic sample of patients recruited from a mental healthcare facility is a strength of the study, it could limit the generalizability of the findings. Patients included in the study mostly suffered from a moderate to severe depression and experienced recurrent episodes. As in many patient groups in specialized mental healthcare, the participants in this study often had more than one psychiatric diagnosis. Patients with co-morbid disorders such as anxiety disorders, PTSD, personality disorders and developmental disorders were also included in the study. Possibly, the results in our study are influenced by symptoms from psychiatric conditions other than depression. Therefore, generalization of the findings to nonclinical groups or clinical groups not suffering severe depression or co-morbid psychiatric conditions remains an issue of further study.

The present study offers more insight in the relative role of aspects of rumination and aspects of positive future thinking in predicting depression. The key finding that perceived control is a mediator of the relationship between brooding and depression points at a potential intervention target. Future research efforts aimed at exploring methods to increase perceived

control over goal achievement should be conducted to further clarify its potential use in the treatment of depression.

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