

Why are Depressive Individuals Indecisive? Different Modes of Rumination Account for Indecision in Non-clinical Depression

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Abstract Individuals with depressive symptoms tend to adopt an abstract-analytical (A-A) rather than a concrete-experiential (C-E) mode of rumination. A large body of evidence shows that this leads to many deficits that are associated with depression (Watkins in *Psychol Bull* 134:163–206, 2008). In two studies, the present research examined whether indecision in a non-clinical population could also result from the mode of rumination adopted. In the first study, 174 participants completed measures of depressive symptoms, rumination, decision-making styles and indecision. The results of this study showed that indecision and one dysfunctional decision-making style (hyper-vigilance) significantly correlated with A-A rumination, even when controlling for depression. In a second study, 71 participants with mild to severe depressive symptoms (MSDs) and 49 participants with no to minimal depressive symptoms were trained to adopt either an A-A or a C-E rumination mode, and subsequently requested to make 10 choices. Consistent with the results of the first study, the results of the second study showed that participants in the A-A condition took longer to make their choice compared to participants in the C-E condition, irrespective of their level of depression. Moreover, the group of participants with MSDs experienced

slightly more difficulty in decision making when they were in the A-A mode than in the C-E mode. This suggests that the A-A rumination mode could be an antecedent of indecision, whereas the C-E mode predicts its reduction. These interpretations are in line with the idea that A-A rumination is maladaptive and C-E rumination is adaptive.

Keywords Rumination · Modes of rumination · Indecision · Depression

Introduction

The association between depression and indecision is well established, to the extent that indecision is considered as a core defining feature of depression (DSM-IV, American Psychiatric Association [APA.] 2000; ICD-10, World Health Organisation [WHO], 1992). Researchers have observed this association in both clinical and non-clinical populations. For example, Radford et al. (1986) found that, of the in-patients with psychiatric disturbances they observed, the depressed patients were particularly indecisive. These results were later replicated with an Australian depressed population, who exhibited maladaptive decision-making styles and showed greater stress when making a decision, compared to the non-depressed sample (Radford et al. 1991).

More recently, Leykin and DeRubeis (2010) found that depressive symptoms were associated with self-reported suboptimal decision-making styles in every-day life, greater dependence on other people, increased brooding and reduced reliance on one's own intuitions. In a following study, Leykin et al. (2011) provided depressed individuals with a number of different decision-making scenarios related to social situations, career situations,

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potential conflict, self-improvement, family, and relationships. Again, their results showed that depressive symptoms were associated with poorer decision-making (i.e. poorer rational reasoning and a poorer decision outcome), as well as reduced activity, lower self-efficacy in facing the decision task, less information gathering, and more intense negative emotions.

Although the studies just described provide some insights into the difficulties depressed individuals have in decision making, there exists little research on the causes of indecision in depression.

Another stream of research has examined factors related to indecision independently of depression. This research was galvanized following the work of Frost and colleagues, who coined the concept of Indecisiveness (Frost and Shows 1993), which is the personality trait associated with the inability to make decisions. Since then, researchers have focused primarily on personality correlates, demonstrating that indecisiveness is related to lower self-esteem (Burka and Yuen 1983; Ferrari 1991), neuroticism (Jackson et al. 1999), procrastination (Beswick et al. 1988), and perfectionism (Frost and Shows 1993). However, investigation of the antecedents of indecision remains neglected in this field as well. The present paper addresses this gap in the literature by examining whether indecision stems from the type of rumination that individuals with depressive symptoms adopt.

Two Rumination Modes

Rumination is a “repetitive, prolonged, and recurrent thought about one’s self, one’s concerns and one’s experiences” (Watkins 2008, p. 1). It is considered as a typical characteristic in individuals with depressive symptoms. Indeed depressed individuals typically use rumination as a way to deal with their symptoms, although paradoxically this process ends up exacerbating negative moods and, in the end, maintains the depressive symptoms (Nolen-Hoeksema 1991). Recently, authors have proposed that rumination should be considered as “a common mental process experienced by everyone” (Watkins 2008, p. 1), as it simply reflects the attempt to reduce discrepancies between a current state and desired goals or expectancies. In addition, they argue that adaptive or maladaptive outcomes largely depend on the mode of rumination adopted. Watkins and colleagues distinguish between an abstract-analytical (A-A) rumination mode and a concrete-experiential (C-E) mode (Moberly and Watkins 2006; Watkins 2008; Watkins and Moulds 2007; Watkins and Teasdale 2001; 2004; Watkins et al. 2008). In the A-A mode, individuals focus on higher-level causes and meanings of the experience. Their thoughts are centred on questions such as “What does this mean for my life?”, “Why do I always react this way?”. By contrast, in the C-E mode, individuals

focus on lower-level, specific details and emotional reactions. They tend to experience thoughts such as “How did this happen?”, “How could I intervene to fix this problem?”, and “What are my feelings here and now?”.

Numerous studies have shown that the C-E rumination style is more adaptive, as it reduces depressive symptoms, negative self-judgment (Watkins et al. 2009) and emotional vulnerability to stressors (Watkins 2004; Watkins et al. 2008). The A-A rumination mode, in contrast, is considered to be maladaptive as it increases negative global self-evaluations (Rimes and Watkins 2005), impairs social problem solving (Watkins and Baracaia 2002; Watkins and Moulds 2005) and prolongs emotional recovery from failure (Moberly and Watkins 2006). In addition, induced AA rumination was found to dampen executive processes in dysphoric young adults, in particular the capacity to inhibit irrelevant information during tasks that involve strategic processes (Philippot and Brutoux 2008).

Consistently, studies have shown that individuals with depressive symptoms tend to be more abstract in their ruminations than non-depressed individuals or recovered depressed individuals (Watkins and Moulds 2007). This tendency is correlated with other maladaptive traits that typically represent a risk factor for depression, such as alexithymia (Di Schiena et al. 2010) and perfectionism (Di Schiena et al. 2012). In the same line, it has been repeatedly shown that interventions aimed at reducing A-A and at increasing C-E thinking are effective in reducing depressive symptoms (Watkins et al. 2009; Watkins et al. 2012).

Rumination and Indecision in Depressed Individuals

In an extensive review, Watkins (2008) suggests that the A-A rumination style exacerbates and maintains depressive symptoms because it remains at a level that is too general: thinking about the meanings and implications of a certain situation does not provide solutions. In contrast, contextual details about the specific means, alternatives, and actions to solve the specific situation are only available at the C-E level.

Decision-making requires detailed and specific representations of what to do, a clear focus on available alternatives and actions to be undertaken. Because the C-E rumination style directly addresses these concerns, whereas the A-A rumination style does not, we hypothesized that an A-A rumination style would lead to more indecision, compared to a C-E rumination style.

Previous evidence collected in the field of depressive rumination is in line with this expectation, although in these studies the earlier conception of rumination was adopted, i.e. only self-focused thinking about symptoms was considered as rumination, and there was no distinction between the A-A and C-E modes of rumination.

Ward and colleagues, for example, found that decision makers who indulged in depressive rumination were less confident and committed in their decisions (Ward et al. 2003). Recently, van Randenborgh and colleagues assessed indecision in a realistic decision-making task, inducing dysphoric individuals to either ruminate about themselves and their symptoms, or to be distracted. Their results showed that the dysphoric participants in the rumination condition perceived the decision task as more difficult and felt greater uncertainty about their choice than the other groups (van Randenborgh et al. 2010).

A comparison of two different modes of thinking has been investigated only by McCrea et al. (2008), although applied to a different topic: i.e. task-procrastination. Participants were asked to accomplish a simple task such as filling in a questionnaire, and to send it back via e-mail within 3 weeks. Using a variety of manipulations, the task was presented either in an abstract or in a concrete mode. Results showed that participants were more likely to procrastinate when the scenario was represented in an abstract mode and that this effect did not depend on the attractiveness, importance, or on the perceived difficulty of the task. If we conceive that one manifestation of indecision is the postponement of choice, the results of McCrea et al. (2008) support the idea that an abstract mode of thinking promotes indecision.

Two studies were undertaken to test our hypothesis. Study 1 investigated the correlations among indecision, decision-making styles, modes of rumination and depressive symptoms. The first objective was to explore the specific association between modes of rumination and indecision or maladaptive decision-making styles. The second objective was to replicate earlier findings about the association between depressive symptoms and indecision or maladaptive decision-making, and between depressive symptoms and rumination modes.

Study 2 directly addressed issues of causality by experimentally inducing A-A and C-E rumination modes in both depressed and non-depressed individuals. We examined whether indecision varies as a function of the rumination mode induced. Following the definition provided by Germeijs and de Boeck (2002), indecision was assessed using measures of choice latency, perceived difficulty, and discomfort. This operational definition also allowed us to examine the behavioural, cognitive, and emotional facets of indecision.

Study 1

In this study we measured depressive symptoms, indecisiveness, and dispositional modes of rumination in a sample of undergraduate students. A measure of decision-making styles was also included, based on the theory of

Janis and Mann (1977), which identifies four different styles of decision making: vigilance, hyper-vigilance, procrastination and buck-passing. *Vigilance* consists in adopting deliberate attention and effort in deciding and being aware of all the issues at stake; *hyper-vigilance*, consists of an over-investment of cognitive resources in the act of deciding; *procrastination* and *buck-passing* represents defensive avoidance strategies, as they involve either postponing a choice, or passing the responsibility onto others due to an inability or unwillingness to make a decision. This classification has been empirically supported in previous studies, which further showed that vigilance should be considered as an adaptive style, as opposed to the other styles that represent different aspects of maladaptive decision-making (Mann et al. 1997).

Based on the above premises, the main objective of this first study was to investigate the association between rumination modes on the one hand, and indecisiveness or maladaptive decision-making styles on the other hand. We also aimed to control for depressive symptoms, to exclude the possibility that the variance in common with depression would inflate these associations. More precisely, we expected indecision to correlate positively with the A-A rumination style and negatively with the C-E rumination style. Consistent with this prediction, the same pattern was expected for the three maladaptive decision-making styles. Conversely, we expected the vigilance decision-making style to correlate positively with C-E rumination and negatively with A-A rumination.

In addition, other associations were expected based on the previous literature, and examined in the present dataset: i.e. the association between depressive symptoms and indecision (cf. Leykin et al. 2011), between depressive symptoms and maladaptive decision-making styles (*ibidem*), between depressive symptoms and rumination modes (Watkins 2008), as well as the reciprocal relationships among the different styles of decision-making and indecisiveness (Mann et al. 1997).

Method

One hundred and seventy-four undergraduates at a large French-speaking university (38 male, *Mage* = 21.40, *SD* = 3.44) completed a series of self-report questionnaires in exchange for 5 Euros. They were recruited via the mailing list of the Faculty of Psychology and asked to fill in a series of questionnaires as part of a larger survey.

The Zung Self-Rating Depression Scale (Zung et al. 1965; Brislin 1970) was used to measure depression levels. It is comprised of 20 items evaluating depression symptoms including bad mood, pessimism, asthenia, and suicidal ideas. Participants rated the frequency of each symptom on a 4-point scale, ranging from 1 (*rarely*) to 4

(always) “over the past several days”. The total score ranged from 20 to 80. Scores ranging from 20 to 49 indicate the absence of depressive symptoms, from 50 to 59 indicated a mild depression, from 60 to 69 indicate a moderate depression, and scores of 70 or more indicate severe depression. In the present study this scale displayed good internal consistency (Cronbach alpha = .86).

The French version of the Mini Cambridge-Exeter Repetitive Thought Scale (Mini-CERTs; Original version: Barnard et al. 2007; French version: Douilliez et al. 2010) was used to measure modes of rumination. This scale is comprised of 15 items, 8 measuring the C-E rumination mode and 7 measuring the A-A rumination mode. Participants were given the cue “When thoughts, feelings, situations or events about me come to mind...” and a list of phrases to complete the cue. For example, a C-E rumination mode response was “I seem to be engaged and directly in touch with what is going on around me”; whereas an A-A rumination mode response was “I focus on the causes and meanings of what happened”. Each item was rated on a 4-point scale (1 = *almost never*, 4 = *always*). Prior research has found good internal consistency across these items (Cronbach alpha levels of .77 and .80 for the C-E and A-A rumination subscales, respectively; Douilliez et al. 2010). We found similar levels of internal consistency in the present study (Cronbach alpha levels of .71 and .74 for C-E and A-A rumination scales, respectively).

The Melbourne Decision Making Questionnaire (MDMQ; Mann et al. 1997) is a 22-item questionnaire designed to measure the four different decision-making styles formulated by Mann and colleagues: vigilance, hyper-vigilance, procrastination, and buck-passing (Mann

et al. 1997). Participants indicated their level of agreement to each statement on a 3-point *Likert* scale (1 = *not true for me*, 2 = *sometimes true for me*, 3 = *true for me*). Vigilance consists of six items, hyper-vigilance of five items, procrastination of five items, and buck-passing of six items. The MDMQ has been demonstrated to have adequate internal consistency, construct validity, and predictive validity (Mann et al. 1997). In the present study, the questionnaire data yielded adequate Cronbach alphas: 0.90 for vigilance, 0.83 for hyper-vigilance, 0.85 for procrastination and 0.89 for buck-passing.

The Indecisiveness Scale (IS) by Frost and Shows (1993) was also used. It consists of 15 items reporting the frequent behaviour of indecisive individuals (e.g., “I try to put off making decisions”), rated on a 5-point *Likert* scale (1 = *strongly disagree*, 5 = *strongly agree*). The total score ranging from 15 to 75 is obtained by summing all item scores, with higher scores reflecting higher levels of indecisiveness. Previous validation studies showed adequate psychometric properties (Frost and Shows 1993; Rassin et al. 2007), which were replicated in the present data (Cronbach alpha = 0.89).

Results and Discussion

Correlation indexes and descriptive statistics for all variables are displayed in Table 1. While the mean depression score was 40.60, indicating, on average, a non-depressed sample, the standard deviation was quite large (9.14), with a maximum score of 68. Thus, there was enough variability in our sample to include individuals with depression; more precisely, twenty-seven out of a hundred and seventy-four

Table 1 Pearson-moment correlations between depressive symptoms (Zung-SDI), general indecisiveness (IS) decision making styles (MDMQ) and modes of rumination (CERTs) (N = 174)

	1	2	3	4	5	6	7	8
1. ZungSDI	1.00							
2. IS	.54***	1.00						
3. Vig.	-.07	.07	1.00					
4. Hyp.	.39***	.57***	.45***	1.00				
5. Procr.	.33***	.59***	.26**	.70***	1.00			
6. Buck-pass.	.33***	.55***	.36***	.69***	.67***	1.00		
7. A-A	.40***	.26**	-.02	.22*	.14	-.02	1.00	
8. C-E	0.45***	-.22*	.15	-.10	-.09	-.13	-.26**	1.00
<i>M</i>	40.60	44.16	17.80	10.74	9.49	12.20	2.49	2.33
<i>(SD)</i>	(9.14)	(10.73)	(4.08)	(3.62)	(3.59)	(4.27)	(.56)	(.49)

Means are in the last row, with standard deviations in parentheses. Due to missing values, the *N* ranged from 167 to 171

Zung-SDI = Self-Rating Depression scale. A-A = CERTs abstract-analytic mode of rumination sub-scale. C-E = CERTs concrete-experiential mode of rumination sub-scale (Barnard et al. 2007). IS = Indecisiveness Scale (Frost and Shows 1993). Vig., Hyp., Procr. and Buck-pass. stand for the Vigilance, Hyper-vigilance, Procrastination and Buck-passing subscales of the MDMQ (Mann et al. 1997). Partial correlations controlling for Zung-SDI are in italics

* $p < .01$, ** $p < .005$, *** $p < .001$

(15.52 %) passed the cut-off for the presence of depressive symptoms, which is consistent with the general rate of depression in developed countries being between 10 and 25 % for women and between 5 and 12 % for men (DSM-IV, American Psychiatric Association [APA.] 2000).

A normality check was performed on all variables, considering skewness and kurtosis between -1 and $+1$ as a criterion of normality, and through graphical inspection of histograms. This check revealed that three subscales of the MDMQ were not normally distributed: procrastination, buck-passing, and vigilance. Therefore, a square root transformation was applied to these variables.

Table 1 shows that depressive symptoms positively correlated with dysfunctional decision making styles and indecisiveness, but not with vigilance. These results replicate previous work demonstrating the difficulty depressed individuals have in making decisions (Leykin and DeRubeis 2010; Leykin et al. 2011). Depressive symptoms were also positively correlated with A-A rumination and negatively correlated with C-E rumination (see Table 1). Again, these results are consistent with prior research in which A-A and C-E rumination modes have been found to lead to maladaptive and adaptive consequences, respectively (for a review, see Watkins 2008).

Furthermore, we found indecisiveness positively associated with all three maladaptive decision-making styles (hyper-vigilance, procrastination and buck-passing), whereas it was not associated with the vigilance decision-making style. This pattern further strengthens the claim that indecision reflects a maladaptive decision process. High inter-correlations between the three maladaptive decision-making styles, hyper-vigilance, procrastination and buck-passing ($.67 < r < .70$) suggest that these factors may actually represent a more general maladaptive attitude in decision making. Consistent with this, vigilance was not associated with any of these factors (cf. Mann et al. 1997).

Since A-A and C-E were both correlated with depression, when associations involved other variables also related to depression (i.e. indecisiveness, hyper-vigilance, procrastination and buck-passing), the Zung-SDI score was partialled out, to avoid the possibility that estimates could be inflated by this commonality. The resulting correlations were partly consistent with our expectations: the A-A rumination mode was positively correlated with indecisiveness and hyper-vigilance, whereas no association was found with procrastination or with buck-passing. No negative correlation with vigilance was found either. The C-E rumination style, on the other hand, was negatively correlated with indecisiveness, but no association was found with hyper-vigilance, procrastination or with buck-passing, nor was there a positive correlation with vigilance.

To summarize, these preliminary results showed that two aspects related to maladaptive decision-making

(indecision and hyper-vigilance) are also related to an A-A mode of rumination. Procrastination and buck-passing were also positively correlated with depressive symptoms, but the present data did not show that these associations are attributable to variation in the rumination mode.

As for the C-E rumination style, we found that it was negatively related to indecisiveness, confirming that individuals adopting a more C-E mode of thinking are less likely to be indecisive. However, the association with vigilance was null, and no negative association was found with any of the maladaptive decision-making styles. This suggests that C-E is still somehow related to indecision, but in a way that is not related to other variables considered here. A possible explanation could be that a more C-E style of thinking facilitates decision-making, as it provides more detailed action plans, and increases the capacity for imaging the scenario's options (Watkins 2008). However, since none of these aspects were investigated in the present study, it is up to future studies to test this theory.

Although these findings provide some insights into the relation between rumination styles and indecisiveness, they do not allow us to draw any conclusions about causality. To address the question of causality, we conducted a second study using an experimental procedure.

Study 2

In this study the rumination mode of participants was experimentally manipulated and participants were randomly assigned to an A-A rumination condition or to a C-E rumination condition. We then observed how such rumination modes affected the extent to which the participants were indecisive. In order to also test the direct effect of depression, and any possible interaction with rumination modes, two groups were created based on the severity of self-reported depression.

Method

Overview of the Procedure and Design

The study proceeded in three steps: The first step involved the *pre-selection of participants* based on their level of depressive symptoms, in order to create two groups: one with No to Minimal Depressive symptoms (NMDs group) and the other with Mild to Severe Depressive symptoms (MSDs group).

The second step involved the *manipulation* of the rumination mode. Pre-selected participants were contacted and induced to ruminate in an A-A or in a C-E mode in a laboratory-session, which involved reflecting upon 10 situations. Participants had to verbalize their thoughts aloud,

following different instructions depending on the condition to which they had been randomly assigned. Verbalizations were taped and transcribed for the manipulation check. Since rumination may also affect emotions, emotion measures were taken before and after the induction to control for any confounding effect of emotion variation.

The third step was the *choice task*. After the mode of rumination was primed, participants were presented with 10 fictitious dilemmas related to the ten situations of the induction procedure, presented in random order. For each dilemma we measured the latency of choice response, the level of perceived difficulty, and the level of discomfort.

This procedure resulted in a 2 (rumination style: C-E vs. A-A) \times 2 (depression group: NMDs vs. MSDs) between-participants experimental design, with choice latency, perceived difficulty and discomfort to fictitious dilemmas as the dependent variables. All steps are described in greater detail in the following section.

Pre-selection of Participants

Five hundred undergraduates from a French-speaking university were contacted and requested to fill in an online version of the Beck-Depression Inventory-II (Beck et al. 1996) as part of a general survey. *The Beck-Depression Inventory-II* (Beck et al. 1996; French version: Centre de Psychologie Appliquée 1996) assesses the extent to which individuals are depressed with 21 items, each rated on a scale from 0 (*no symptoms*) to 3 (*severe symptoms*). The total possible score ranges from 0 to 63. The diagnostic cutoffs are the following: 0–13: minimal depression; 14–19: mild depression; 20–28: moderate depression; and 29–63: severe depression. The BDI-II has shown excellent internal consistency and test–retest reliability with a diverse range of samples (Arnau et al. 2001; Steer et al. 2000).

Within this group of students, an equal number of subjects with high and low BDI scores was contacted to create the two groups. Among those, 141 agreed to take part in our experiment. Based on the clinical cutoffs, 70 participants with a BDI-II score of 13 or lower constituted the NMDs group, and 71 with a BDI-II score of 14 or higher constituted the MSDs group. To detect any change in their level of depression from the moment of the first contact to the moment of the experiment, the BDI-II was re-administered at the end of the laboratory session. This check revealed that 21 out of the 70 NMDs displayed BDI-II scores higher than 13 at the time of the experiment, and they were consequently eliminated from the analysis. On the contrary, none of the participants in the MSDs group displayed re-test scores that were below the depression cutoff. The resulting two groups had the following characteristics: 49 participants in the NMDs group (33 female, $MBDI = 6.08$, $SD = 3.73$, $Age = 22.45$, $SD = 3.37$); 71 participants in the MSDs

group (59 female; $MBDI = 20.98$, $SD = 7.57$; $Age = 22.13$, $SD = 3.22$). They were randomly assigned to one of two conditions: A-A rumination mode (37 MSDs, 22 NMDs) or C-E rumination mode (34 MSDs, 27 NMDs).

Manipulation

A 20 min induction procedure was adapted from Moberly and Watkins (2006) to induce C-E or A-A rumination. This induction consisted of asking participants to imagine possible future events in 10 situations likely to occur to students. Each situation was presented successively on a computer screen for 2 min. To avoid any possible emotional induction, the situations were balanced with respect to emotional valence (5 positive: *dinner with friends*, *surprise birthday party*, *successful presentation*, *successful job interview*, *discovering that one has a natural talent* and 5 negative: *being new at the university*, *stressful revising for a difficult exam*, *a fight with a close friend*, *having a bad day*, *being involved in a car accident*).

Participants in the C-E condition were instructed as follows: “Build up a detailed image of the situation, as if you were playing a movie of the event in your head. Spend a few moments imagining the scene as if you were really there, looking out into the scene. Imagine as vividly as possible what you could see, hear, feel, touch and experience in that situation.” Participants in the A-A condition, on the other hand, received the following instructions: “The description provided is only a summary of what happened. Try not to think about details, but reflect more generally on the meaning this situation has for you and your life. Think about why the situation occurred and what it means and implies”. All participants provided consent to participate and were assisted by the experimenter throughout the entire procedure to ensure they followed the instructions correctly. All the situations were taken from the Moberly and Watkins (2006) procedure, as well as the instructions, and translated onto French. We deviated from the original procedure by asking participants to verbalize their reflections aloud instead of providing a written report. These responses were audio recorded.

Participants’ state emotions were assessed before and after the induction, using Visual Analogue Mood Scales. These scales consisted of unipolar horizontal lines, measuring the extent to which people felt joy, anxiety, bad mood, anger, sadness, excitement, and good mood. Participants rated their responses on a scale of 1–9 (1 = *not at all*, 9 = *completely*).

We conducted a manipulation-check of the rumination modes by asking two independent judges to rate the recorded verbal reports on the following dimensions: (a) The extent to which the verbal report focused on concrete objects, sensory details, feelings and sensations and (b) The extent to which

the verbal report focused on causes, meanings and implications. These ratings were made on a 4-point scale (1 = *not at all*, 2 = *slightly*, 3 = *moderately*, 4 = *very much*). To further ensure the effectiveness of the manipulation, these recordings were transcribed and a software-based analysis was then run on the transcriptions using the Tropes program (Piolat and Bannour 2009). This software measures the number of words belonging to specific categories by means of specific indices. Based on the definition of the A-A and C-E rumination modes, we examined whether the C-E condition showed higher indices of verbs related to facts and actions, indications of places, and time connections. We also examined whether the A-A condition was characterized by higher indices of verbs referring to emotional meanings, declarative verbs, stating opinions and evaluative comparisons.

Choice Task

A series of ten dilemmas was created. Each dilemma consisted of two options related to trivial aspects in each scenario. To create a certain degree of conflict, options were selected based on a qualitative pilot study where groups of undergraduate psychology students discussed which options would have been more difficult to choose between. For both options, a pro-argument was added to balance the values. For example, with respect to the “surprise party” scenario, participants were asked to choose between calm versus rhythmic music: the former would have created a nice atmosphere in general, the latter would have made people who like to dance happy. For each dilemma, participants were instructed to select only one of the two options. They were provided as much time as necessary to make their choice and were informed that there was no best option.

The dilemmas were presented using E-prime software, which also randomized the order of presentation of the dilemmas. Each one was displayed on the screen until the participant selected the preferred option. The software recorded the latency of the choice response for each dilemma. Ratings of perceived difficulty (1 = *not difficult*, 7 = *extremely difficult*) and discomfort (1 = *not at all*, 7 = *very much*) were presented on the screen after each option was selected and before the following dilemma. These ratings were recorded by E-prime. After the procedure, participants were fully debriefed and informed about the objective of the study.

Results

Manipulation Check

Participants in the A-A condition provided more A-A rumination responses ($M = 3.91$, $SD = 0.43$) than the

individuals in the C-E condition ($M = 1.42$, $SD = 0.40$), $t(133) = 34.96$, $p < .001$. On the other hand, participants in the C-E condition provided more C-E rumination responses ($M = 3.89$, $SD = 0.40$) than individuals in the A-A condition ($M = 1.26$, $SD = 0.51$), $t(133) = 33.31$, $p < .001$. A second judge randomly rated 10 % ($n = 12$) of the verbal reports, equally distributed across conditions. This yielded an inter-rater agreement of $r = .94$ for the C-E rumination condition and of $r = .93$ for the A-A condition (both $ps < .001$).

Tropes-based analyses were run on a sub-sample of transcribed verbal reports corresponding to one positive and one negative scenario of 66 participants equally distributed among the four cells of the design. As expected, individuals in the C-E condition displayed higher indices of verbs referring to facts, $t(66) = 4.96$, to actions, $t(66) = 3.163$, indications of places, $t(66) = 3.55$, and time connections, $t(66) = 4.38$, all $ps < .05$. Alternatively, individuals in the A-A condition displayed higher indices of verbs referring to personal emotional states, $t(66) = -2.09$, declarative verbs, $t(66) = -2.97$, stated opinions, $t(66) = -5.02$, and evaluative comparisons, $t(66) = -2.22$, all $ps < .05$. These results show that the manipulation was effective in inducing different modes of rumination.

Emotion Measures

To rule out the confounding effect of emotional change following the training, a series of $2 \times 2 \times 2$ mixed ANOVAs with Time (before the induction vs. after the induction) as a within-subjects factor and rumination modes (A-A vs. C-E) and depression (NMDs vs. MSDs) as between-subjects factors was run. The VAMS measures (joy, excitement, good mood, anxiety, bad mood, anger, and sadness) were the dependent variables. We found no main or interaction effects. Thus, emotional states did not influence our current results.

Effects of Rumination Modes on Indecision (Latency of choice, Perceived difficulty, and Discomfort)

Overall, participants took on average 12.02 ($SD = 7.60$) seconds in making their choice, rated the difficulty of decision-making to be 2.71 ($SD = 1.70$), and felt a discomfort with the dilemmas of 2.19 ($SD = 1.49$). All three of these indicators were significantly correlated after controlling for dilemmas random effect (choice latency and perceived difficulty: $r = .44$, choice latency and discomfort: $r = .32$, perceived difficulty and discomfort: $r = .55$, all $ps < .001$, two-tailed). These results suggest that this measure of indecision was internally consistent. It should be noted, however, that the perceived difficulty and discomfort were rated quite low.

As in Study 1, we assessed whether variables were normally distributed. Only choice latency was particularly left-skewed and was then corrected by a logarithmic transformation, as is common practice for reaction time distributions (DeCoster 2001).

To examine the effects of group and condition, we conducted a mixed model analysis with Condition (A-A vs. C-E) and Group (NMDs vs. MSDs) as fixed factors and Dilemma (10) as a random factor. For this analysis, all dependent variables were listed for the 10 dilemmas in a restructured matrix, resulting in 1,200 cases. Two outlying cases were removed and discarded from the NMDs group, one in the A-A and the other in the C-E condition. Thus, in total, we had 1,198 remaining cases.

The mixed model analysis revealed a main effect of rumination modes on choice latency. Participants in the A-A condition took significantly longer in making their choice ($M = 12.63$, $SD = 7.79$) than the participants in the C-E condition ($M = 11.42$, $SD = 7.36$), $F(1, 1177) = 17.29$, $p < .001$. No other main or interaction effect was found on this variable (see Fig. 1).

For perceived difficulty, we found an interaction between rumination style and depression that was trending towards significance, $F(1, 1177) = 3.29$, $p = .07$: MSDs participants perceived slightly higher difficulty in the A-A rumination condition ($M = 2.89$, $SD = 1.72$) than in the C-E rumination condition ($M = 2.62$, $SD = 1.65$), whereas no difference was observed within the NMDs group (C-E: $M = 2.67$, $SD = 1.73$; A-A: $M = 2.58$, $SD = 1.66$) (see Fig. 2).

Concerning discomfort, a significant interaction was found, but in an unexpected direction: No differences were observed within the MSDs group, while within the NMDs

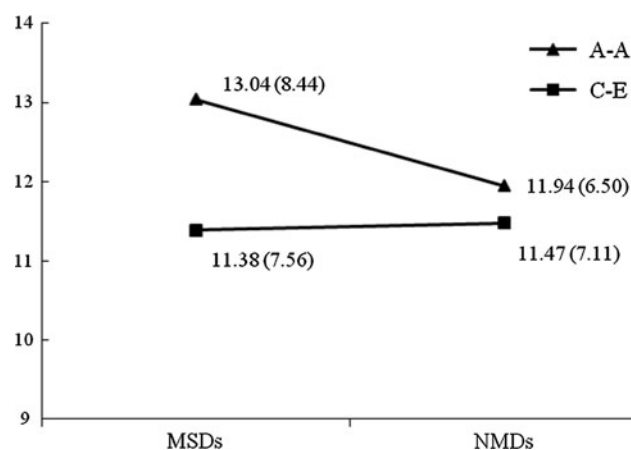


Fig. 1 Means and standard deviations of “choice latency” in the choice task, as a function of depression group and rumination mode condition. *Note:* Means and SD are displayed in seconds. A-A = abstract-analytic rumination mode condition; C-E = concrete-experiential rumination mode condition; MSDs = mild to severe depressive symptoms; NMDs = no to minimal depressive symptoms

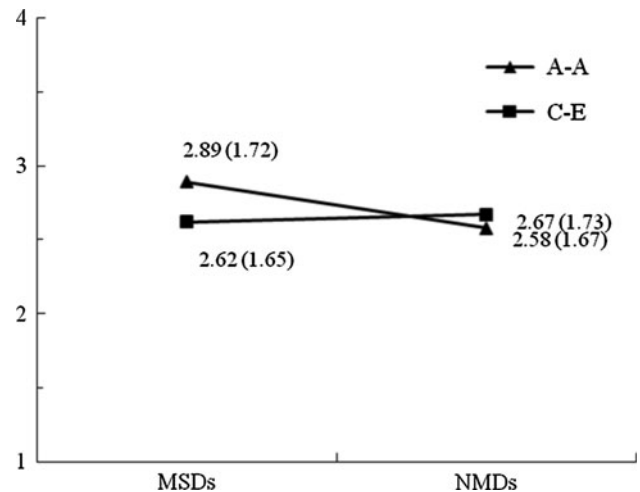


Fig. 2 Means and standard deviations of “perceived difficulty” in the choice task, as a function of depression group and rumination mode condition. *Note:* Means and SD are measured on a self-report 1 to 7 scale. A-A = abstract-analytic rumination mode condition; C-E = concrete-experiential rumination mode condition; MSDs = mild to severe depressive symptoms; NMDs = no to minimal depressive symptoms

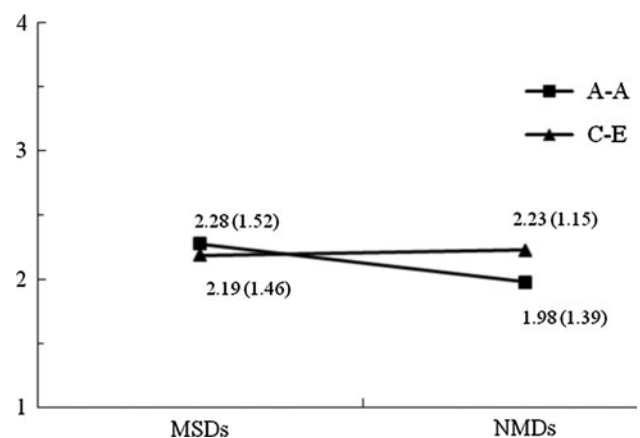


Fig. 3 Means and standard deviations of “perceived discomfort” in the choice task, as a function of depression group and rumination mode condition. *Note:* Means and SD are measured on a self-report 1 to 7 scale. A-A = abstract-analytic rumination mode condition; C-E = concrete-experiential rumination mode condition; MSDs = mild to severe depressive symptoms; NMDs = no to minimal depressive symptoms

group participants felt less discomfort in the A-A condition ($M = 1.98$, $SD = 1.39$) than in the C-E condition ($M = 2.23$, $SD = 1.54$), $F(1, 1177) = 4.11$, $p < .05$ (see Fig. 3).

Discussion

As expected, participants were significantly slower in making a decision when they adopted an A-A rumination mode; results also showed that they perceived decision-making to be slightly more difficult under this mode, but

only if they were already depressed. It should be noted, however, that this last effect was only approaching significance, thus interpretations that will be proposed below must be taken with caution. Concerning discomfort, surprisingly only the non-depressed group was affected by the rumination mode manipulation, although in an unexpected direction, as they felt less discomfort in the A-A rumination mode condition than in the C-E rumination mode condition.

First, the decision-making process was faster in the C-E than in the A-A mode of rumination. This effect might reflect that the focus on concrete details of the specific decision scenario provides all the necessary elements to come up with a choice and resolve the uncertainty, whereas in the A-A mode the focus on meanings and implications might bring about a representation of the scenario that transcends the specific situation. Such general representations are then less suggestive of concrete outcomes and actions and consequently less helpful than concrete elements in order to reach a concrete decision. Furthermore, the fact that depression did not have an impact at this level indicates that the role of other depression-related mechanisms, such as general behavioral slowness, can be excluded on this purely behavioral aspect of indecision.

In contrast, the marginal difference between the two rumination modes on perceived difficulty, although in the expected direction, interacted with depressive symptoms. Assuming that this difference is reliable and could possibly become significant in a clinically depressed population, this effect suggests that the A-A (C-E) rumination mode does not, in and of itself, alter the impression of difficulty in the decision-making-process. Rather, other factors related to depression interact with rumination to modulate perceived difficulty in decision-making. The recruitment of executive functions might be such a factor, because it is notably deficient in individuals with depressive symptoms (for a review see Elliott 1998; Fossati et al. 2002), and it is important in the decision-making process, as this activity requires a high degree of cognitive control (Tranel et al. 1994), in particular for the inhibition of irrelevant information (Del Missier et al. 2010). Earlier research showed that the induction of an A-A mode of rumination dampens executive functions in depressive but not non-depressive individuals (Philippot and Brutoux 2008; Watkins and Brown 2002), a result that parallels what was observed in the present study on perceived difficulty in decision making. Based on these premises, we argue that the group with depressive symptoms has found the decision task more difficult, presumably because their executive functions were dampened in the AA condition. Consistent with this, it is possible that individuals in the C-E mode were focused on the elements of the decision scenario, and thus did not need to inhibit irrelevant information concerning general

meanings and implications for their life that may have intruded in their decision making process. However, since no measure of executive functions was available in the study, this interpretation remains speculative and the effect itself needs to be replicated and validated on a more depressed population in order to clarify its significance.

As for discomfort associated with decision-making, a significant unexpected result was observed that is worth discussing: the group of non-depressed in the A-A condition reported significantly less discomfort than the other groups. This result may stem from a number of factors that were not measured in the present study, but that differentiate depressed from non-depressed individuals. One such factor may be the need for cognition, which has been shown to be higher in non-depressed individuals than in depressed individuals (Epstein et al. 1996). It is possible, for example, that non-depressed individuals instructed to choose based on general meanings and implications for their life found this activity less stressful because this style of rumination was consistent with their higher need for cognition.

Over and above these considerations, the presence of two interactions signals that the severity of depressive symptoms is an important variable to take into account when trying to understand and predict the impact of the two modes of rumination on indecision. For these reasons, these findings should be clarified with clinically depressed individuals in an experimental setting.

General Discussion

The present research aimed to investigate whether different modes of rumination are related to indecision in depression. There is substantial agreement about the fact that indecision is a common characteristic among individuals with depressive symptoms; this notion is based on the clinical literature (DSM-IV; APA 1994), as well as on later correlational and cross-sectional studies (Leykin et al. 2011; Radford et al. 1991). Besides this, there is a large literature showing that an A-A mode of rumination is an important factor in depression maintenance (Watkins 2008), whereas a C-E type of rumination reduces these symptoms (Watkins et al. 2009, 2012).

Consistent with our hypotheses, in the first study we found an association between indecisiveness, hyper-vigilant decision-making and A-A rumination.

In our second study, we found that modes of rumination affected choice latency and decision difficulty, although this last effect was marginal and interacted with depressive symptoms.

In summary, results of these two studies help to elucidate the role rumination styles play in explaining

indecisiveness in depression, a research topic that has so far been neglected in the field of depression research. Additionally, they raise new questions about how specific aspects of depression may interact with rumination modes.

However, some methodological limitations are worth mentioning and will be discussed in order to improve and advance future research. As Study 2 addressed the limitations of Study 1, we will focus our discussion on the limitations of Study 2.

Firstly, the absence of a reference condition, or a baseline measure of indecision before the training, implies that additional work is required for a more precise estimation of the direction of the effects. Although we were able to detect a difference in the expected direction on some aspects of indecision, it remains unclear whether this difference was due to the A-A rumination increasing indecision or to the C-E rumination decreasing indecision. Unfortunately, in the present procedure the creation of a baseline measure or of a control group was not feasible as the choice task involved scenarios that participants had already familiarized themselves with in the induction. We recommend that future research addresses this limitation by including a baseline condition.

Secondly, the dilemmas used were fictitious, so their consequences could only be imagined and had no real impact on the life of the participants, which might explain why all groups on average experienced a low level of both difficulty and discomfort. To overcome this problem of ecological validity, we recommend that future studies test the effects of this type of manipulation on real choices capable of producing consequences in the actual experience of the participants.

Thirdly, the samples were in both studies composed mostly of female undergraduates, which limits the possibility to generalize the present results to other populations. There is much evidence showing that females react to their depressed mood with a ruminative response style, focusing on their symptoms, causes and implications (Nolen-Hoeksema 1991), compared to their male counterparts that opt rather for distraction. Based on this effect, we might assume that the exploration of gender differences could reveal different patterns of associations between depression and indecision that we did not consider here.

Lastly, many participants in the mild to severe depressive symptoms group had non-clinical depression scores, based upon a self-administered depression questionnaire. We presume that results observed here might become more contrasted if a similar procedure is applied on a clinically depressed population, however, until further evidence is collected one should exercise caution in generalizing these findings to clinical populations.

Notwithstanding the above limitations, these results still have clinical implications. For example, they suggest that

cognitive interventions tailored to reduce abstract thinking, or to increase concrete thinking, should help depressed individuals to deal with their difficulties in decision-making. Concreteness training (CNT), for example, is a novel treatment that attempts to directly target this tendency, and repeated practice of CNT exercises can help people to shift their thinking style (Watkins et al. 2009, 2012). Similarly, mindfulness-based therapy is also designed to reduce evaluative and generalized thinking and to increase awareness of concrete details of the specific situation; it has been described as “bringing one’s complete attention to the present experience on a moment-to-moment basis” (Marlatt and Kristeller 1999, p. 68 in Baer 2003). Previous research has already showed the benefits of CNT (Watkins et al. 2009) and mindfulness-based therapies (Segal et al. 2002; Teasdale et al. 1995) on other depression-related aspects, such as working memory and general negative affect (Jha et al. 2010; Way et al. 2010; Williams 2010). More directly relevant to the present question, rumination training has been shown to decrease A-A rumination and increase C-E thinking, and to develop the capacity to access concrete and specific representations in autobiographical memory (Heeren and Philippot 2011; Heeren et al. 2009). Such treatments might also ameliorate the decision-making process. However, until the present investigation is applied to a clinical population and treatment studies, the above suggestions for clinical practice remain speculative. At the present moment, it is hoped that this study stimulates such investigation, and encourages further exploration of mechanisms underlying indecision in psychopathology.

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