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Assessment and Measurement of Depressive Rumination

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The literature on rumination is very large and diverse. This is due, among others, to variations in the scope of processes involved, the status of rumination as a functional or a dysfunctional response and as a voluntary or an involuntary response, a preference for considering rumination as a state reaction or as a stable disposition, the specific populations studied (normative or clinical; within clinical populations, depressive symptomatology or anxious symptomatology, mostly in relation with worry, post-traumatic stress disorder or obsessive-compulsive disorder).

The present chapter will first review two instruments specifically related to depressive rumination as this is the central topic of the present book. The first instrument reviewed is the the Ruminative Style Questionnaire (RSQ), which derived from the Response Style Theory by Nolen-Hoeksema (e.g., 1987). A large emphasis is given to this measure as it is well-supported by a theoretical model and by a large number of empirical studies, mainly on its predictive validity. Then, a new instrument assessing depressive rumination (the Rumination on Sadness Scale) is presented. The second section of the chapter is dedicated to measures of meta-cognitions in ruminations. Meta-cognitions typically develop when people feel depressed as strategies to cope with depression. The instruments reviewed are the Thought Control Questionnaire (TCQ), the Meta-Cognitions Questionnaire (MCQ), diary methods, the Positive Beliefs about Depression Rumination scale (PBRS) and the Negative Beliefs about Depression Rumination scale (NBRS).

The third section will present effects of experimental inductions of rumination in the laboratory on depressed mood. In those experiments, rumination was directly manipulated, generally in contrast with a distractive condition. Most measures of rumination are based on self-

report scales. Although self-reports are very easy to administer they raise some important questions about how accurately they measure the frequency and the content of mental processes. The fourth section will present one indirect method for assessing rumination as alternatives to self-reports.

The fifth section briefly reviews two instruments initially developed in the context of anxious rumination but which were found to be also related to depressive rumination. The instruments are the Impact of Event Scale or IES) and the Distressing Thought Questionnaire or DTQ). We will conclude this chapter by looking at the convergence and divergence in measures of rumination. The tendency has been up to now to develop more new instruments rather than looking at the overlaps between the existing measures. A recent study addressed these issues and made interesting suggestions on the possibilities of aggregating scales.

For each instrument, we present sampled items, data on its reliability such as internal consistency and test-retest correlation, the factorial structure, validity measures (concurrent, convergent, discriminant, and predictive), and, when available, data on the sensitivity to change of the scales after a treatment has been administered. Finally, a critical evaluation concludes on the usefulness of the scale and the extent to which empirical investigations support the theoretical model.

Self-Reports Instruments for Assessing Depressive Rumination

The Ruminative Style Questionnaire (RSQ)

Background

The Ruminative Style Questionnaire (RSQ) derives from Nolen-Hoeksema's observation that women are twice more likely to become depressed than man (Nolen-Hoeksema, 1987). For

the author, the difference is explained by two antagonistic ways to respond to depressive mood. The first one is distraction, in which people focus their attention on external aspects, unrelated to their current mood state. The second one is rumination, in which people focus their attention on symptoms, meaning, causes and consequences of the dysphoric state. A large set of studies showed that women have a greater tendency to engage in rumination than men when in a depressive mood (for a review, see Nolen-Hoeksema, 1987). A ruminative thinking style will then maintain or reinforce the depressed mood previously instated.

Three mechanisms are suggested to account for the effects of ruminative responses on the maintenance of depressive mood (Nolen-Hoeksema, 1987). First, rumination interferes with attentional mechanisms and the initiation of instrumental behaviors (e.g., Kuhl, 1981). Second, depressed mood affects the recall of episodes stored in the autobiographical memory, the perception and the learning of new information. A classical effect is the increased accessibility towards negative information stored in autobiographical memory when a depressed mood has been induced (e.g., Bower, 1981). Third, a ruminative response style has an effect on the type of explanation provided to the current mood state. In a depressed mood, people will favor self-depreciating explanations which, in turn, will reinforce the depressive state (e.g., Abramson, Seligman, & Teasdale, 1978) (for more details see the chapter by Nolen-Hoeksema in this book).

Following Nolen-Hoeksema's view, rumination is a passive response to depressive mood which needs to be distinguished from adaptive emotion-focused coping responses, such as reappraisal or seeking social support. Rumination maintains all the available attention towards the symptoms of depression, which does not allow any space for emotion regulation, for instance in the form of emotion repair. Emotion repair represents all individual attempts to change a negative situation into positive outcomes such as imagining or planning something desirable.

Assessment

Items, reliability, stability and factor structure. Nolen-Hoeksema and Morrow (1991) developed a self-report questionnaire intended to assess four different types of reactions to negative mood. This initial version of the Response Style Questionnaire (RSQ) included 71 items measuring ruminative, distractive, problem-solving, and dangerous activities. Respondants were instructed to focus on their thoughts when they feel "sad, blue, or depressed". For each item, they indicate overall how often they experience each response on a 4-point scale ranging from 1 ("almost never") to 4 (almost always"). The problem-solving and the dangerous activities scale were dropped in further studies due to very low reliability coefficients.

The RSQ now comprises a Ruminative Responses Scale (RRS) and a Distracting Responses Scale (DRS). RRS is a 22 items scale evidencing very high internal reliability, with Cronbach's α ranging from .88 to .92 (Bagby et al., 1999; Just & Alloy, 1997; Nolan, Roberts, & Gotlib, 1998; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema, Parker, & Larson, 1994). Items focus either on the meaning of rumination ("I write down what I am thinking about and analyze it"), on the subjective feelings related to the depressed mood ("I think about how sad I feel"), on symptoms ("I think about how hard it is to concentrate"), and on consequences and causes of the

mood (“I think I won’t be able to do my job if I don’t snap out of this”). Recently, a short version of the scale has been developed (Nolen-Hoeksema & Jackson, 2001), which contains 10 items from the original list of 22. The scale was obtained by selecting the items that had the highest item-total correlations with the total score. Authors also made sure that they covered the range of self-focused and symptom-focused constructs (Nolen-Hoeksema, 2001, personal communication). The short version is highly related to the full version of the scale ($r = .90$) and has a high level of internal reliability (Cronbach’s $\alpha = .85$). The construct validity and the test-retest reliability of this short version still needs to be demonstrated, however.

Several studies support the view that the RSQ measures a stable tendency to ruminate. In a longitudinal study looking at people who lost a loved one (Nolen-Hoeksema & Davis, 1999), the RSQ was administered before the loss, and 1, 6, 13, and 18 months after the loss. The intraclass correlation across five times of measurement was high ($r = .75$). In another study with recently bereaved people, Nolen-Hoeksema et al. (1994) obtained a large test-retest correlation of the RSQ after a 6 month interval, $r = .80$. In a study looking at the effects of chronic strain, low mastery, and rumination style on depressive symptoms in men and women (Nolen-Hoeksema et al., 1999), 1,100 community-based adults were interviewed twice at 12 months interval. The test-retest correlation for the RSQ was $r = .67$. Just and Alloy (1997) found a lower correlation, however, in a group of clinically depressed people also after a 12 month interval, $r = .47$, $p < .001$.

The RRS is supposed to be independent of the scale measuring preferences for distracting activities (DRS). The DRS is a 13 items scale describing active, distracting responses to depression that are not dangerous or reckless. Examples of items on the DRS include “When I feel depressed I ... go to a favorite place to get my mind off my feelings” and “...I talk with

friends about something other than how I am feeling”. The assumption of independence between the RRS and the DRS is confirmed by a non-significant correlation between the scales in a clinical sample of severely depressed patients, $r = .08$ (Bagby et al., 1999), and in a sample of initially non-depressed freshmen followed longitudinally, $r = .14$ (Just and Alloy, 1997).

The factor structure of the RRS was examined in two college students sample (Roberts, Gilboa, and Gotlib, 1998). In the first sample ($N = 299$), an exploratory factor analysis yielded a three-factor solution which accounted for 55.7% of the variance. The first factor labeled “Symptom-based rumination” accounted for 17.4% of unique variance. It included seven items ($\alpha = .81$) such as “Think about how passive and unmotivated you feel” or “Think about how you don’t feel up to doing anything”. The second factor which was composed of five items ($\alpha = .84$) was labeled “Introspection/self-isolation” and accounted for 21.2% of the unique variance. Sampled items were “Go someplace alone to think about your feelings” or “Isolate yourself and think about the reasons why you feel sad”. The third factor (“Self-blame”) was composed of three items ($\alpha = .71$) and accounted for 17.1% of unique variance. Sampled items were “Think about a recent situation wishing it had gone better” or “Think about how angry you are with yourself”. Although the three factor solution accounted for a large part of the variance, six items were not retained in the final solution. The second sample ($N = 317$) was used to run a confirmatory factor analysis in order to test the replicability of the three factor solution obtained in the first sample. The solution was confirmed with the small modification that one item loaded on two factors. Indices of fit reached the criterion thresholds¹ (GFI = .910, AGFI = .874, and RMSEA = .046). Moreover, all factor loadings were statistically significant.

Despite these encouraging findings, six items from the RRS were not retained in the factorial analysis. Further studies need to test the replicability of the factor structure obtained by

Roberts et al. (1998). If the same structure is obtained, it would be worth only considering the 15 items which loaded on the three factors. The issue of the factor structure is also critical as regards the predictive validity of the scale, which will be developed in the next section. Indeed, the predictive validity of the RRS was always examined with the total score. One can wonder if the results would be replicated when using only the three interpretable factors and also which scale would evidence the highest relationships with depression.

Validity. The predictive validity of the RRS has been examined in a very large set of studies. The first part of this section examines studies conducted with non-clinical populations, while the second part extends it to clinically depressed patients.

In a first study with non-clinical populations, a group of students completed by chance the RRS and the DRS together with the Inventory to Diagnose Depression (Zimmerman, Coryell, Corenthal, & Wilson, 1986), a scale assessing depression severity, two weeks before a major earthquake (Nolen-Hoeksema & Morrow, 1991). The group was then followed-up ten days and seven weeks after the stressful event. A regression analysis revealed that the more people adopted a ruminative response style following the earthquake, the more severely depressed they were after 7 weeks, no matter their initial level of depression or their initial level of stress.

In another longitudinal study with recently bereaved people, Nolen-Hoeksema et al. (1994) examined additional predictors of depression severity six months after the death of a family member such as optimism measured by the Life Orientation Test (Scheier & Carver, 1985), and social support assessed by the Social Support and Activities Scale (O'Brien, Wortman, Kessler, & Joseph, 1989). The other predictors were the same as in the previous study (depression at 1 month, presence of additional stressors, score on the RSQ). Results from a multiple regression analysis showed that the propensity to ruminate measured by the RSQ made a

significant contribution in predicting depression severity over and above the contribution of depression at 1 month which was forced into the equation first. The other variables (optimism, social support and additional stressors) made only a small contribution in predicting depression severity. As concluded by Nolen-Hoeksema et al. (1994, p. 102) “The results of this study suggest that the ways people respond to their initial symptoms of distress following their loss may influence the long-term impact of the loss on their emotional well-being. Specifically, people who cope with those initial negative emotions with rumination have trouble adjusting to their loss and are at risk for long-term emotional difficulties.”

A recent study extended the predictive validity of the RRS for depression by including dimensions of the social context (Nolen-Hoeksema & Davis, 1999). A large group of people recently traumatized by the loss of a loved one were interviewed before the loss and then again 1, 6, 13, and 18 months following the loss. Results indicated that people scoring high on the RRS (high ruminators) were seeking more actively for social support. Although social support *per se* is generally beneficial, it also depends on the type of feedback offered by the social environment and the accuracy of the perception from the traumatized individual. The study revealed that high RRS scores were more sensitive to the type of feedback they received than low RRS scores. However, a high level of rumination was not systematically associated with a high level of subjective distress. When the social context was favorable (high level of emotional support, low level of social friction, and high level of comfort when discussing about loss), high RRS scores were less distressed throughout the 18 months following the loss as compared to high RRS scores for which the social network was critical about their reactions. Third, a strong negative relationship was observed, only among high ruminators, between score on the RRS and the subjective perception of the quality of social support received, after controlling for level of

distress. This result suggests that despite a greater desire for social support, high ruminators perceive their social support as poor and not fulfilling their expectancies. As noted by Nolen-Hoeksema and Davis (1999, p. 812): “People may be less supportive of ruminators because ruminators go over and over their loss and persistently discuss their feelings and grief-related symptoms without making much progress toward “resolving” their loss.” On the other hand, the impact of social support on subjective distress was only of small magnitude in the low ruminators group.

The respective contribution of a ruminative response style and social conditions in the prediction of depression was investigated in two recent studies (Nolen-Hoeksema et al., 1999, Nolen-Hoeksema & Jackson, 2001). Social conditions were related to chronic strain (e.g., lack of affirmation in close relationships, housework or childcare inequities), and to lack of control (or low mastery). The study was conducted with a large community sample. Results from structural equation modeling showed that while the level of preference for a ruminative response style measured by the RRS was directly related to the level of depression severity, the level of strain and the level of mastery had only an indirect effect on depression, both being mediated by the score on the RRS (Nolen-Hoeksema et al., 1999). This suggests that low mastery and high level of strain would only contribute to depression severity when associated with a high preference for rumination. Results showed that low mastery and high level of strain are more prevalent in women than in men. Women generally experience more chronic strain by feeling less valued in their family and working role, and they are also more likely to feel a chronic lack of control over their environment.

The mediating effect of low mastery on the gender difference in rumination was recently replicated by Nolen-Hoeksema and Jackson (2001) who found that women believe more than

men that negative emotions are difficult to control and that they feel responsible for maintaining positive social relationships. The study highlights that particular beliefs related to social status and emotion regulation in women would reinforce ruminative tendencies in that group, which in turn is likely to increase proneness to depression. For instance, the study showed that women care more than men for maintaining positive relationships with others. This hypervigilance bias towards own and other's emotions would then lead to ruminative preoccupations about how to respond to these emotions and about feeling responsible for the emotional tone of their relationship. In turn, more ruminations are likely to contribute to maladaptive responses when the person experiences a stressful situation. Finally, alternative explanations for the higher prevalence of rumination in women such as differences in distress, emotional expressivity, or the tendency to give more socially desirable responses were rejected.

The data reviewed up to now support the predictive validity of the RRS for non-clinical, untreated individuals with mild to moderate depression. A study conducted in a group of patients diagnosed with a primary unipolar, non-psychotic major depression did not provide the expected relationship between the score on the RRS and neither the number of previous depressive episode ($r = .01$), nor the duration of current depressive episodes ($r = -.05$) (Bagby et al., 1999). Just and Alloy (1997) also failed to find that the amount of ruminative responses would predict the duration of depressive episodes in a longitudinal prospective study with initially nondepressed freshmen. These studies suggest that the effects of ruminative style on depression severity are restricted to non-clinical populations².

Contrasting with these results, two recent studies with clinically depressed participants have shown that a preference for ruminative responses represents a vulnerability factor to depression (Nolan et al., 1998; Roberts et al., 1998). First, they indicated that elevated levels of

rumination were found in currently and previously dysphoric individuals but not in never dysphoric participants. Results from Roberts et al. (1998) also indicated that rumination tendencies measured by the RRS is associated with prolonged episodes of depression. Nolan et al. (1998) then showed that elevated scores of both neuroticism and rumination and not a previous history of depression are the best predictors of subsequent elevated depressive symptoms. A path model analysis also indicated that neuroticism does not directly affects mood state. Rather, high levels of neuroticism determine a specific cognitive style which involves a particular attentional focus on depressed mood. In turn, this cognitive style increases the probability of developing a ruminative style which then directly contribute to predict subsequent depression.

Finally, a recent prospective study suggests that rumination can predict depression severity among clinically depressed people (Nolen-Hoeksema, 2000). The first goal of the study was to test the relationship between ruminative responses measured by the RRS and depressive severity 1 year later in a large community sample ($N > 1100$). Depression was assessed by the Beck Depression Inventory (BDI, Beck et al., 1961), the Hamilton Rating Scale for Depression (HRSD, Hamilton, 1960) and the Structured Clinical Interview for DSM-IV, Axis I Disorders (First et al., 1995). Separate analyses with people clinically depressed and people non depressed at time 1 showed that ruminative response score on the RRS predicted depression severity at time 2 over and above depression severity at time 1 in both groups.

A second purpose of the study was to examine if a propensity to ruminate could predict anxiety and mixed anxiety/depression symptomatology. Content analysis of ruminator's thoughts indicate that uncertainty over whether important situations are controllable and manageable is a central component of their cognitive activity (Lyubomirsky, Tucker, Cladwell, & Berg, 1999). At

the same time, several theorists argued that uncertainty about being able to control one's environment is a key feature of anxiety (e.g., Alloy, Kelly, Mineka, & Clements, 1990). Taken together with the propensity of ruminators for negative evaluations of the self and hopelessness about the future (Abramson, Metalsky, & Alloy, 1989), these data suggest that people scoring high on the RRS would also be particularly prone to a mixed anxiety/depression syndrome. Four groups (no-symptom, depression only, anxiety only, mixed anxiety/depression) were created based on their score of depression and anxiety (measured by the Beck Anxiety Inventory; Beck & Steer, 1990). Results revealed an identical pattern at both times of measurement with the mixed depression/anxiety group having a significantly higher RRS score than the three other groups. The depression only and the anxiety only groups did not differ from each other but were significantly higher than the no-symptom group. These results show a similar relationship between ruminative response style on the one hand and depressive and anxious symptomatology on the other hand. Moreover, when depression and anxiety are combined they seem to make ruminative cognitions even more pervasive. As a consequence, the instructions for completing the RRS have been recently revised (Nolen-Hoeksema & Jackson, 2001). Instead of asking people to think of situations when they feel "sad, blue or depressed" the new instructions refer to situations when people feel "upset – sad, blue, nervous". In that way, the RRS now includes situations in which people feel depressed and/or anxious.

Although these results need further replications, they raise the question of the specificity of the RRS to predict depressive symptoms. If a ruminative style predicts both anxiety and depression this would suggest that a propensity for rumination represents a vulnerability factor for emotional disorders in general .

The convergent and the discriminant validity of the RRS has been examined in various studies. First, the assumption of a moderate relationship with depressive symptoms have been consistently supported. Roberts et al. (1998) showed that the three factors of the RRS (Symptom-based rumination, Introspection/self-isolation, and Self-blame) were correlated with current depressive symptoms measured by the Inventory to Diagnose Depression (IDD, Zimmerman et al., 1986) ($r_s = .23$ to $.43$, all $p_s < .001$), worst lifetime depressive symptoms measured by the IDD-Lifetime Version (Zimmerman & Coryell, 1987) ($r_s = .34$ to $.45$, all $p_s < .001$) and neuroticism measured by the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1964) ($r_s = .16$ to $.19$, $p_s < .01$ for “Introspection/isolation”, $r_s = .33$ to $.41$ for “Symptom-base rumination”, $p_s < .001$ and $r_s = .43$ to $.44$ for “Self-blame”, $p_s < .001$). High correlations were also found between the total RRS score and current depressive symptoms measured by the IDD ($r_s = .53$ to $.57$, both $p_s < .001$), worst lifetime depressive symptoms measured by the IDD-Lifetime Version ($r = .61$, $p < .001$) and neuroticism measured by the EPI ($r = .57$ $p < .001$) (Nolan et al., 1998).

As regard discriminant validity, the RRS was found to be negatively related to dispositional optimism measured by the Life-Orientation Test (LOT; Scheier & Carver, 1985), r ranging from $r = -.30$ to $-.36$, $p < .001$ and to social support measured by the Social Support and Activities Scale (O’Brien et al., 1989), $r = -.38$ to $-.40$, $p < .001$ (Nolen-Hoeksema et al., 1994). These results suggest that people with low dispositional optimism and poor social support are more likely to report ruminative coping. Within the social support measure, RSQ was particularly related to two-subscales labeled “Isolation” measured by items such as “Have you felt isolated from others?” and “Friction” measured by items such as “Have people in your personal life gotten on your nerves?”.

Finally, a ruminative response style is related to different beliefs about emotion coping. People who ruminate more as measured by the short version of the RSQ (Jackson & Nolen-Hoeksema, 1998) think that rumination is a response they should have following symptoms of negative emotion ($r = .38, p < .001$). Higher scores on the short version of the RSQ is also associated with a lower belief of control over experiencing negative emotions ($r = -.21, p < .001$) and to a lower sense of mastery about people's own lives ($r = -.44, p < .001$) (Nolen-Hoeksema & Jackson, 2001).

Finally, sensitivity of the RRS to change was examined in one study looking at the effectiveness of Attention Training (Wells, 1990) in the treatment of major depression (Papageorgiou & Wells, 2000). ATT is based on the Self-Regulatory Executive Function (S-REF; Wells & Matthews, 1994) which assumes that modifications of metacognitive dimensions are beneficial in the treatment of recurrent depression. In ATT, patients are encouraged to practice auditory monitoring exercises that require progressively greater attention. Three specific phase are distinguished: selective attention, attention switching, and divided attention. Patients were first assigned to no-treatment baseline for 3 to 5 weeks. They were then administered 5 to 8 weekly sessions of ATT, and followed up at 3, 6, and 12 months post-treatment. Measures of the short form of the RRS at pre- and posttreatment and follow-up showed substantial decrease at post-treatment which was maintained in the three follow-ups.

Another study examined sensitivity to change in a group of patients diagnosed with unipolar depression or dysthymia (Siegle, Sagrati, & Crawford, 1999). Patients completed the RRS and the BDI before therapy and after 15 to 20 sessions of cognitive behavior therapy for depression. Results showed that higher RRS scores were associated with a longer time to recovery and that the association was mediated by the initial severity of depression. Both a

preference for rumination and initial severity of depression would make harder to learn positive ways of thinking about information. Both aspects are thus important to assess in determining how many sessions of cognitive behavior therapy for depression an individual should receive.

Critical Evaluation

From the observation of a higher prevalence of depression in women, Nolen-Hoeksema developed a theoretical model which can account for these differences. She showed that women consistently orient more their responses toward a ruminative style when feeling depressed than men. This orientation toward depression leads to the maintenance or even to the growth of depressive symptoms. On the other hand, men would favor distractive responses which take the attention away from the stress source. Two scales were developed to measure these orientations, the Ruminative Responses Style (RRS) and the Distractive Responses Style (DRS). A large set of studies support the reliability of the RRS, with high scores of internal consistency and test-retest stability. The factor structure of the scale has not been investigated systematically, however. Further studies using confirmatory factor analyses need to be conducted to test the replicability of the three factor solution suggested by Roberts et al. (1998). If that structure is confirmed it means that six items need to be removed from the existing 22-items version of the scale. Conway, Csank, Holm, & Blake (2000) also emphasized that one factor of the RRS (“Symptom-based rumination”) is more related to previous symptoms of dysphoria than to rumination, suggesting some problems of content validity.

The predictive validity of the scale was demonstrated by a large set of studies showing its ability to predict depression at follow-up, over and above other variables such as initial depression or additional stressors. Further studies showed that particular beliefs related to social status and emotion regulation in women also have an effect on depression. This effect is indirect,

however, being mediated by the score on the RRS. The predictive validity of the RRS for clinical populations with major depression has been questioned by some authors. A recent prospective study suggests, however, that the scale predicts depression severity at 12 months over and above depression severity at onset. Finally, recent findings question the specificity of the relationship between a preference for a ruminative style and depression by showing that scores on the RRS are higher for mixed depression/anxiety than for depression only. One very important step for the validation of the RRS will be to conduct experimental studies which will allow to draw direct inferences on the causal effect of rumination on depression and anxiety severity as most of the present studies were cross-sectional or longitudinal.

Although the predictive validity of the RRS is well supported, there are too few studies, however, which have assessed its convergent and discriminant validity to make valid conclusions on this issue. The lack of studies examining the relationships between rumination scales will be emphasized later in this chapter. Conclusions about the DRS are more difficult to draw as only a few studies have included the scale. This can be explained by the lack of empirical support for the assumption of a higher level of distractive responses in men when in a depressed mood and the assumption that a higher preference for the distractive style would reduce depression severity (e.g., Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1993). As a matter of fact, Nolen-Hoeksema and colleagues did not include the DRS in their most recent studies.

The Rumination on Sadness Scale (RSS)

Background

A new scale has been recently developed and validated which intends to assess specifically rumination on current feelings of distress (Conway et al. , 2000). These authors define rumination on distress as “repetitive thoughts concerning one’s present distress and the

circumstances surrounding the sadness” (Conway et al., 2000, p. 404). They make an important distinction with Nolen-Hoeksema’s view on rumination by excluding social sharing on sadness as part of rumination, while for Nolen-Hoeksema rumination includes disclosing feelings of sadness to others.

Items, reliability, stability, and factor structure

Items of the RSS were derived from a conceptual basis with the goal of assessing various aspects of rumination specifically related to sadness and distress. For each item, people are asked to refer to situations in which they feel sad, down, or blue. Responses are recorded on a 5-point scale ranging from “not at all” to “very much”. The RSS includes items measuring the intensity and repetitive quality of ruminative thoughts (“I repeatedly analyze and keep thinking about the reasons for my sadness”), the difficulty with stopping ruminative thoughts (“I have difficulty getting myself to stop thinking about how sad I am”), the attempts at understanding the nature of one’s distress (“I search my mind repeatedly for events or experiences in my childhood that may help me understand my sad feelings”), and the lack of instrumental goal orientation (“I lie in bed and keep thinking about my lack of motivation and wonder about whether it will ever return”).

Internal consistency was found to be very high ($\alpha = .91$) in a sample of 220 students. Test-retest reliability was satisfactory ($r = .70$), although it was assessed over a short time interval (2 to 3 weeks). A principal component analysis revealed a one-factor solution (Conway et al., 2000, study 1), which was replicated in a second sample of 201 students (Conway et al., 2000, study 2).

Validity. Evidence for the concurrent validity of the scale was provided by a high correlation with the RSQ, $r = .81, p < .001$ (Conway et al., 2000). The convergent and discriminant validity of the RSS was assessed by examining its relationship with a large set of other constructs (ibidem). An expected high relation was found with depression severity assessed by

the BDI (Beck et al., 1961), $r = .56, p < .001$. Partial correlations were also computed to assess the amount of unique variance shared between the RSS and the RRS on the one hand and the severity of depressive symptoms on the other hand. Results showed that the partial correlation between the RSS and the BDI when controlling for the RRS remained significant, $r = .30, p < .001$, while the correlation between the RRS and the BDI when controlling for the RSS was no more significant, $r = .08, ns$. This is an indication that the RSS share more unique variance with depression than the RRS.

The relationship between the RSS and the Five-Factor Model was assessed by using the NEO-FFI (Costa & Mc Crae, 1989). A strong positive correlation was found with neuroticism, $r = .66, p < .001$ and a moderately strong negative correlation was found with extraversion, $r = -.39, p < .001$. Low negative correlations were also found with agreeableness, $r = -.26, p < .001$ and with conscientiousness, $r = -.24, p < .01$. As suggested by Conway et al. (2000, p. 422) these last three results suggest that “individuals are more likely to ruminate to the extent that they are more introverted, more antagonistic toward others, and less oriented in a disciplined manner toward goal achievement”. Low but significant positive relationships were also observed with the tendency for habitual use of imagery, $r = .21, p < .05$, and for vividness of dreams, daydreams, and imagination, $r = .23, p < .01$, both assessed by the Individual Differences Questionnaire (Paivio & Harshman, 1983). A moderate relation was observed with absorption, $r = .37, p < .001$, assessed by the Absorption scale of the Multidimensional Personality Questionnaire (Tellegen, 1982), which suggests that people who ruminate can become highly involved in their own thoughts. Self-reflectiveness, which includes attempts at better identifying one’s own needs or feelings and analyses of the causes of one’s own thoughts, feelings and actions was strongly related to the RSS, $r = .50, p < .001$. The RSS was also negatively related to self-deception, $r = -$

.28, $p < .001$, and to impression management, $r = -.15$, $p < .01$. These last results suggest that people with a high tendency for depressive rumination are less likely to be overconfident in their judgments and to present themselves in a socially desirable manner. Finally, the RSS was not related to emotional expression or self-disclosure.

The predictive validity of the RSS was investigated in one study (Conway et al., 2000, study 3). People scoring high and low on the scale were exposed to a sad mood induction. Immediately afterwards, half of the participants were asked to wait before completing a self-report about how distressed they felt regarding their two most pressing current concerns (delay condition), while for the other half no waiting period was provided (no-delay condition). Results showed that high RSS scorers were more distressed in the delay condition than in the non-delay condition and that within the delay condition high RSS scorers reported being more distressed than low RSS scorers. On the other hand, low RSS scorers did not differ significantly in the delay and the non-delay condition. These results would suggest that providing high ruminators with an opportunity to ruminate (delay condition) increase their level of distress. Although there was no control on the mental activity of participants during the delay condition, it is assumed that the higher level of reported distress for high RSS scorers was the result of spending a higher proportion of their time ruminating about their sadness than low RSS scorers.

Critical evaluation

The RSS seems to be a promising scale for assessing depressive rumination. The scale is internally consistent and reliable and assesses one single dimension. The scale also shares a higher proportion of unique variance with depression severity than the RSQ. The convergent and discriminant validity has been demonstrated by expected relationships with broad dimensions of personality, cognitive functions related to imagery, self-deception and impression management or

emotional expressiveness. These results are only preliminary and require further replications. Additional data are also needed to assess the predictive validity of the scale.

Measurement of Meta-cognitions about Depressive Rumination

“Meta-cognitions refer to beliefs and appraisals about one’s thinking and the ability to monitor and regulate cognition” (Papageorgiou & Wells 2001 b, p. 160). People usually develop meta-cognitions when they fail in their attempts to control their thoughts (e.g., Kelly & Kahn, 1994; Wegner & Pennebaker, 1993). For instance, in situations in which people are instructed to suppress thoughts about a trivial topic (i.e., a white bear), there is a surge of thoughts related to the suppressed topic when participants are later allowed to think freely (see Wegner, 1992). One outcome of this rebound effect is to initiate meta-cognitions about people’s abilities to control thoughts. For instance, experiencing the rebound effect is followed by increased reports of feeling out of control of, and distressed by one's thoughts (e.g., Wegner, Schneider, Carter, & White, 1987; Wegner, Schneider, Knutson, & McMahon, 1991).

Recently, instruments have been developed to assess meta-cognitions about rumination with the assumption that ruminative responses may represent particular strategies to cope with depression. We first review briefly the Thought Control Questionnaire (TCQ, Wells & Davies, 1994) and the White Bear Suppression Inventory (WBSI, Wegner & Zanakos, 1994), which can be considered as two precursors in the measurement of meta-cognitions. Both are indices of thought control strategies associated with depressive rumination. The next instrument reviewed is the Meta-Cognitions Questionnaire (MCQ, Cartwright-Hatton & Wells, 1997). Then, results from a diary study aiming at differentiating meta-cognitions in relation with depressive and anxious rumination will be presented. Results from this diary study together with the development of the MCQ were the precursors for two new and promising questionnaires labeled the “Positive Beliefs

about Depressive Rumination Scale” (PBRS, Papageorgiou & Wells, 2001a, 2001 b) and the “Negative Beliefs about Depressive Rumination Scale” (NBRS, *REF*) which are presented next.

The Thought Control Questionnaire (TCQ)

Background

Wells and Davies (1994) report that intrusive thoughts are a frequent phenomenon in normal and clinical populations with both anxiety disorders (such as obsessive-compulsive disorder or posttraumatic stress disorder) and depression. These intrusive thoughts usually elicit feelings of distress and discomfort. In reaction to these negative feelings, people develop various strategies with the goal of controlling further occurrences of intrusive thoughts. “The Thought Control Questionnaire (TCQ) was developed to provide a measure of the various techniques which individuals use to control unpleasant and unwanted thoughts” (Wells & Davies, 1994, p. 875).

Items, reliability, stability, and factor structure

The TCQ is a five-factor instrument (distraction, social control, worry, punishment, and reappraisal), with 6 items for each factor. People are instructed to answer about the techniques they generally use to control unpleasant and/or unwanted thoughts on a four point rating scale ranging from “never” to “almost always”. Sampled items were “I occupy myself with work instead” for distraction, “I ask my friends if they have similar thoughts” for social control, “I focus on different negative thoughts” for worry, “I punish myself for thinking the thought” for punishment, and “I question the reasons for having the thought” for reappraisal. Items content suggest that three factors can be used as potential measures of rumination (worry, punishment and reappraisal). The distraction measure is very close to the DRS scale from the RSQ (Nolen-Hoeksema & Morrow, 1991), and the social control factor investigates aspects related to

inhibition vs. free expression through intrapersonal ways (“I keep the thought to myself”) or interpersonal ones (“I talk to a friend about the thought”).

Internal consistency was found to be acceptable ($\alpha = .64$ for punishment, $\alpha = .67$ for reappraisal) to good ($\alpha = .72$ for distraction, $\alpha = .79$ for social control, and $\alpha = .71$ for worry). Test-retest reliability was examined with a six-weeks time interval. Coefficients ranged from $r = .67$ for punishment to $r = .83$ for social control, demonstrating acceptable to very good stability (Wells & Davies, 1994).

Validity

Discriminant and convergent validity was assessed by administering the TCQ together with measures of stress vulnerability such as neuroticism and extraversion), trait anxiety or self-consciousness and measures of perceived lack of control over thinking such as worry.. Among the three factors assessing rumination, worry and punishment presented a very similar pattern of significant relationships with the other constructs investigated (for worry, $r = .45$ with neuroticism, $r = .50$ with trait anxiety, $r = .54$ with social worry, $r = .52$ with meta-worry; for punishment, $r = .49$ with neuroticism, $r = .53$ with trait anxiety, $r = .50$ with social worry, $r = .59$ with meta-worry). Reappraisal, on the other hand, was only related to private self-consciousness ($r = .46, p < .001$). These results suggest that worry and punishment subscales are specifically related to emotional vulnerability, while reappraisal is a more functional strategy, at least if it includes positive reappraisal, which is unfortunately not directly investigated in the TCQ. The relatively modest intercorrelations between the subscales (maximum $r = .27$ between worry and punishment) suggests that the subscales are measuring empirically distinct dimensions of thought control. Three of the strategies investigated seem to be related to rumination. Among them, two (worry and punishment) are primarily related to anxiety symptomatology as evidenced

by moderate correlations with trait anxiety, while the relationship with depression as measured by the BDI is low, $r = .22$ for worry, $r = .19$ for punishment, both $ps < .05$ (Siegle, 2001). The reappraisal subscale, however, is neither related to anxiety symptomatology, nor to depression, both $r = .14$, *ns* (Siegle, 2001).

Critical Evaluation

The TCQ appears to be a reliable instrument which is able to discriminate among different thought control strategies following the experience of intrusive thoughts. Further data are necessary, however, in order to replicate results obtained by Wells and Davies (1994) and to collect data on the predictive validity of the subscales and the total TCQ score. As noted by these authors “The development of the TCQ is an initial step in research currently in progress which is aimed at developing measures of meta-cognition that may contribute to our understanding of the problem of unwanted intrusive thoughts” (Wells & Davies, 1994, p. 877).

The White Bear Suppression Inventory

Background

Wegner and his colleagues have conducted extensive research on the paradoxical effects of thought suppression as a strategy of mental control (see Wegner & Pennebaker, 1993). Thought suppression has two main consequences. First, it is only successful for a short time. The suppressed thought usually bounces back quickly. Second, the occurrence of the suppressed thought in mind is higher than before the strategy of thought suppression has been initiated. This delayed increase in the frequency of the suppressed thought has been called the rebound effect (see Wegner, 1992, 1994). Automatic and voluntary processes are involved to explain this effect (e.g., Wegner & Erber, 1992).

An important finding from Wegner's studies was "that suppressing distressing emotional thoughts increase the likelihood that the individual will fail to habituate to emotional stimuli relevant to those thoughts" (Wegner & Zanakos, 1994, p. 619). A direct outcome is that chronic thought suppression would be related to hypersensitivity to perceive depressive and anxious thoughts and would lead on the long-term to symptoms of depression and anxiety. The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) was developed to assess people's tendency for chronic thought suppression.

Items, reliability, stability, and factor structure

A list of 72 items that tapped suppression and control of thoughts and emotions was first developed. A three-factor solution (thought suppression, negative affectivity and concentration) was found. Only items which specifically loaded on the thought suppression factor were retained. The resulting 33 items were administered to a large group of psychology students. A factor analysis was then conducted with the same purpose of isolating items that loaded specifically on the thought suppression factor. This led to retain 15 items which loaded on a single factor when a further factor analysis was conducted. The scale includes items such as "There are things that I try not to think about," "I have thoughts I cannot stop," or "There are thoughts that keep jumping into my head." Higher scores on the scale represent a higher tendency to suppress thoughts. Reliability was high with Cronbach's α ranging from .87 to .89. The measure was found to be reliable over time as evidenced by test-retest after one week ($r = .92$) and one month ($r = .69$) (Wegner & Zanakos, 1994).

Validity

The WBSI was consistently related to depression as measured by the BDI with correlations ranging from $r = .44$ to $r = .52$ (Wegner & Zanakos, 1994). This result is consistent

with observations that depressed individuals report frequent attempts to suppress negative thoughts (Wenzlaff, Wegner, & Klein, 1991; Wenzlaff, Wegner, & Roper, 1988). Wegner and Zanakos tested the possibility that among depressed people those who chronically suppress their thoughts related to their depressed mood and particularly dislike having these thoughts are more at risk for later depression (Wegner & Zanakos, 1994, study 5). They developed a brief measure called “depression sensitivity” to assess the extent to which people find disturbing, scary, or socially unacceptable having these negative thoughts. Sampled items were “It is important for me not to let my negative thoughts show” or “I am concerned when I feel sad”. To test their hypothesis, they conducted a hierarchical regression analysis to predict BDI scores from WBSI scores, depression sensitivity scores, and the interaction between these two scales. Results showed that using thought suppression as a mental control strategy (as evidenced by high scores on the WBSI), being sensitive to depressing thoughts and the interaction of both variables predicted BDI scores. As the authors noted (Wegner & Zanakos, 1994, p. 631): “The link between thought suppression and depression suggests that any tendency to suppress thoughts, even without a strong desire to avoid depression, may be tied to depression. The association of depression sensitivity with depression, in turn, suggest that a desire to escape the negative affective state may be associated with depression even when thought suppression is not present.”

Critical evaluation

The WBSI is a reliable and valid scale which provides some interesting explanations on the way some people can become depression prone by chronically suppressing thoughts related to their mood state. The interaction of chronic thought suppression with depression sensitivity (i.e., people who are particularly averse to negative thoughts) seems to make people even more at risk for depression.

The Meta-Cognitions Questionnaire (MCQ)

Background

Following Well's model (1995) people diagnosed with Generalized Anxiety Disorder (GAD) hold both negative and positive beliefs on worry. Negative beliefs are related to potential dangers of worrying, while positive ones are linked to supposedly beneficial effects of using worry as a coping strategy. These beliefs can lead to the development of dysfunctional worry in two ways. First, if negative beliefs are more prevalent, people can withdraw their attempts to control their thoughts. Second, if positive beliefs about the *necessity* for controlling thoughts are prevalent, greater attempts to suppress worries can occur with the paradoxical outcome of resulting in more intrusions (e.g. Wegner et al., 1987). Given the importance of meta-cognitions in the development and the maintenance of problematic worry, Cartwright-Hatton and Wells (1997) developed the Meta-Cognitions Questionnaire (MCQ) a self-report measure to assess beliefs about worry.

Items, reliability, stability, and factor structure

The MCQ is a 65 items scale which assess five factors. The first one (positive beliefs about worrying) include items about beneficial outcomes of worrying for planning and problem solving such as “Worrying helps me to avoid disastrous situation” or “Worrying helps me to plan the future more effectively”. The second one (control of worry) reflects the belief that worry must be controlled together with the belief about the uncontrollability of worry. Sampled items are “I find it difficult to control my thoughts” or “Worrying thoughts enter my head against my will.” Factor 3 deals with lack of cognitive confidence for own's memory and attentional abilities, with items such as “My memory can mislead me at times “ or “I have difficulty keeping my mind focused on one thing for a long time”. Factor 4 involves items related to negative beliefs about

thoughts like “If I did not control a worrying thought, and then it happened, it would be my fault”, or “I could be punished for not having certain thoughts”. Factor 5 is related to preoccupation with ones own thought processes or cognitive self-consciousness. Sampled items are “I think a lot about my thoughts” or “I pay close attention to the way my mind works”. The internal reliability of the scale is satisfactory with a ranging from .72 (factor 5) to .89 (Factor 2). The inter-correlations between the factors were relatively low, ranging from $r = .08$ to $r = .43$, suggesting that relatively distinct aspect of meta-cognitions are investigated in the MCQ. Test-retest at five weeks for the total scale was very high, $r = .94$.

Validity

Data on the convergent validity of the scale support its close relationship with anxious symptomatology as evidenced by strong correlations with the Spielberger Trait Anxiety Inventory (STAI; Spielberger et al., 1983), $r = .68$, or with the Anxious Thoughts Inventory (AnTi; Wells, 1994a), $r = .74$. The discriminant validity of the scale was supported by comparing scores on the MCQ in a group of people with Generalized Anxiety Disorder (GAD), Obsessive Compulsive Disorder (OCD), a clinical group with other emotional disorders and a control group. The GAD and OCD groups scored higher than the two other groups on Factor 2 (uncontrollability). GAD and OCD groups also scored higher than the other clinical group on factor 3 (cognitive confidence) and higher than the non-clinical group on factor 4 (negative beliefs about worry). Regression analyses also showed that proneness to worry was predicted by most of the factors of the MCQ. Importantly, both negative and positive beliefs were related to higher prevalence of worry.

The first factor of the MCQ (positive beliefs about worrying) was also found to be related to a measure of positive beliefs people hold rumination (see section on the Positive Beliefs about

Depressive Rumination Scale (PBRs)), $r = .43$, $p < .001$ (Papageorgiou & Wells, 2001a).

Sensitivity to change was also demonstrated by Papageorgiou & Wells (2001a). Scores on the MCQ decreased at post-treatment and remained low during the follow-ups at 3, 6, and 12 months.

Critical evaluation

The MCQ was built following the model developed by Wells (1995, 1999) on the importance of meta-cognitions related to worry in Generalized Anxiety Disorder (GAD). The scale is made of five factors, among which two are related to positive and negative beliefs people hold about their worries. Empirical data suggest that even in the presence of positive beliefs, worry can still become problematic for the individual. The most dysfunctional consequence will be the development of meta-worry (worry about worry). Although the MCQ is primarily related to anxious rumination, the scale contributed to initial fruitful developments which were later applied to depressive rumination as it will be explained in the next sections.

Diary Assessment of Metacognitive Dimensions of Depression and Anxiety

Results recently obtained by Nolen-Hoeksema (2000) and reviewed above in this chapter suggest that a ruminative response style does not represent a vulnerability factor specifically for depression but also for anxiety and for mixed depression/anxiety. Sharing this perspective, Papageorgiou and Wells (1999) examined whether people have different meta-cognitions in relation with depressive and anxious rumination, with the assumption that meta-cognitions people hold about their thinking process is likely to be involved in the onset and the maintenance of psychopathological disorders. Fifty-four nonclinical participants were asked to report the two main depressive and the two main anxious thoughts that occurred naturally during a two weeks period in a diary which investigated the content, duration, process and metacognitive dimensions for each type of thought (Papageorgiou & Wells, 1999). Overall, the two categories of thoughts

were found to be similar, although some differences emerged. Anxious thoughts were reported as consisting of more verbal content, greater compulsion to act, more effort putted in problem-solving and more confidence in the ability for problem-solving, while depressive thoughts were assessed as more past oriented. Relationships between dimensions of depressive and anxious thoughts and affective responses for each type of thoughts were also examined. Due to the overlap between depression and anxiety symptoms, partial correlations were performed. Results showed a positive relation between, on the one hand, self-reported anxiety and, on the other hand, meta-worry, compulsion to act on the thought, attention devoted to the thought, or distraction resulting from the thought onset when controlling for depression. A positive relation between self-reported depression and low confidence in problem-solving abilities, when controlling for anxiety was also obtained. These results show that rumination is associated with metacognitive processes and that meta-cognitions people hold about their depressive and anxious thoughts evidence some specificity and can be distinguished empirically.

The generalizability of these findings has been recently investigated in a sample of clinical subjects. +++ (*will be completed when your paper is available*)

Positive Beliefs about Depressive Rumination Scale (PBRs)

Background

In their Self-Regulatory Executive Function model of emotional disorders, Wells and Matthews (1994, 1996) proposed that the knowledge base of emotionally vulnerable individuals could predispose them to select and engage in coping strategies such as active and perseverating thinking, i.e. rumination. More specifically, some beliefs people hold about rumination can represent a predisposition for rumination. As presented earlier in this section, Wells (1995, 1999) already showed that people with Generalized Anxiety Disorder (GAD) possesses a particular set

of positive and negative metacognitive beliefs. Positive beliefs relate to advantages for rumination, while negative beliefs investigate disadvantages for rumination. Based on these assumptions, the Meta-Cognitions Questionnaire has been developed (see above). Papageorgiou and Wells (2001 a) recently conducted empirical investigations extending previous findings on meta-cognitions about anxious symptoms to the assessment of beliefs about ruminative depression.

Developments of the Instrument, Items, Reliability and Validity

A semi-structured interview was first conducted with 14 patients who met DSM-IV criteria for Major Depressive Disorder (MDD) and did not meet criteria for concurrent Axis I disorders. Patients were asked to think of the most recent time they felt highly depressed and had rumination. Various probe questions were then asked on the presence and content of metacognitive beliefs about rumination. Positive beliefs were related to coping mechanisms, with sampled answers such as “If I did not ruminate about my feelings, they would never end”, or “Ruminating about my feelings helps me to understand what went wrong in the past”. Negative beliefs were related to uncontrollability and interpersonal consequences of rumination: “Everyone would desert me if they knew how much I ruminate about myself” or “It is very depressing to ruminate about my problems. I could become a complete loser, if I continue to ruminate”. All patients reported advantages and disadvantages for rumination, supporting the assumption that people with major depression hold both positive and negative beliefs about depressive rumination.

If particular beliefs are related to a predisposition for a ruminative response style when in a depressed mood, it would be important to relate on a valid instrument assessing these beliefs. Papageorgiou and Wells (2001b) recently reported the development of an instrument which is

specifically intended to assess positive beliefs related to rumination. A pool of 16 items was derived from positive beliefs reported by patients in the study conducted by Papageorgiou and Wells (2001a). Due to skewness in the distribution of seven items, an exploratory factor analysis based on the 9 remaining items was performed with a large nonclinical sample. This revised 9-item Positive Beliefs about Rumination Scale (PBRs-R) yielded a one factor solution explaining 53.5% of unique variance. The internal consistency was high (Cronbach's $\alpha = .89$), as well as the test-retest reliability. This was evidenced by no significant change on the score in a 6-week interval, which supports the absolute stability of the scale and by a high Pearson product-moment correlation, $r = .85$, which was a strong evidence in favor of the relative stability of the scale. Support for the convergent validity of the PBRs-R was also provided by correlations with the RRS (Nolen-Hoeksema & Morrow, 1991) $r = .53$ and the BDI, $r = .45$. There was some support for the discriminant validity of the scale as evidenced by a significantly stronger correlation with the RRS than with the Penn State Worry Questionnaire (Meyer et al., 1990) which specifically assess proneness for anxious worry. The correlations were of similar magnitude, however, for the Trait depression subscale, $r = .43$, and for the Trait anxiety subscale, $r = .38$ of the STAI. These last results somewhat question the ability of the PBRs-R to predict specific beliefs related to depressive rumination.

Results also endorse the view that the relationship between PBRs-R score and both state and trait depression is mediated by the level of actual rumination. In other words, positive beliefs people hold about their depressive ruminations does not affect directly depressive symptomatology. Rather, the model suggests that positive beliefs increase the frequency of rumination which, in turn, increases depression severity. This model is thus close to the response style theory developed by Nolen-Hoeksema . Finally, the discriminant clinical validity of the

scale was investigated with three clinical groups (recurrent major depression, panic disorder with agoraphobia, and social phobia) and one control non-clinical group who completed the PBRs-R. As expected, patients with recurrent major depression scored significantly higher than the two other patients groups and than the control group.

Critical Evaluation

Overall, the PBRs-R seems to be a very promising scale for assessing positive beliefs about depressive rumination. The first studies indicate that reliability is high and that the scale show good convergent and discriminant validity.

Negative Beliefs about Depressive Rumination

+++ will be completed when your manuscript on the NBRs is ready

Experimental Induction of Rumination in the Laboratory

As it has been shown in this chapter, most studies assessing depressive rumination were retrospective. When people are asked to report the behaviors and cognitions they have engaged in several days or weeks after an emotional episode, they rather report their beliefs about their "typical" behaviors and cognitions than an accurate recollection of their memories. Also, retrospective reports do not allow to draw causal relationships. To overcome these limitations, some studies have directly manipulated depressive rumination in the laboratory.

In one study, Morrow and Nolen-Hoeksema (1990) induced a depressed mood by asking students to read a depressing story while sad music was played in the background. Following the depressed mood, half of the subjects had to focus on their emotional state (rumination condition) and half were asked to think of nonemotional situations (distraction condition). A second manipulation was related to the level of activity (passive vs. active) when doing the rumination/distraction task. Following the response style theory, results showed that

the highest drop in depression mood was found in the condition combining distraction and high level of activity. Results were also very specific as only sadness was affected by the manipulation, while other dependent variables such as anxiety and hostility did not differ across conditions. Nolen-Hoeksema and Morrow (1993) tested the generalizability of these results with clinical populations. Two groups were distinguished based on their score on the BDI (score below 3 for the non-depressed group, score above 7 for the depressed group). After a sad mood has been induced, half of the respondents focused on thoughts that were symptom-focused, emotion-focused, and self-focused while the other half focused their attention on thoughts that were externally focused and not related to symptoms or emotions. The dependent variable was the difference between depressed mood before and after the experimental manipulation. For the depressed group, the rumination condition led to an increase in reported depressed mood, while depressed mood decrease in the distraction condition. In the non-depressed group, however, no difference was found between the rumination and distraction condition for changes in depressed mood. Negative effects of rumination are thus limited to clinically depressed subjects. This suggests that an efficient treatment for depression should first involve alleviating the depressed mood by orienting depressed people's attention to distracting activities. When depressed mood is no more present, perceptive, interpretative and recall biases are no more active. Rumination then represents a functional coping strategy (Morrow and Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1996).

Indirect measures of rumination

Background

All the measures of rumination reviewed up to now were based on self-report measures. Self-reports measures are based on the assumptions that people have a direct access to their

internal responses, and that they are willing to give an accurate report of them. However, several studies mention that these assumptions are often violated. To mention a few, self-reports first increase the risk of reconstruction biases (e.g., Brewer, 1986; Conway, 1990). Also, people have only a very low level of awareness for cognitive processes which mediate inferences and the production of complex behaviors (Nisbett & Wilson, 1977a, 1977b). To overcome these problems, some recent attempts have been made to relate more on performance measures or on psychophysiological or neuroanatomical correlates of rumination. We will present some recent empirical data supporting these alternatives to self-report measures. For physiological and neuroanatomical correlates of rumination, the reader can refer to the chapter written by Siegle in the present book.

The Relationship between Immediate Intrusive Ruminations and Retrospective Intrusive Ruminations

We recently conducted two studies investigating the relationship between the number of intrusive ruminations measured immediately after participants were exposed to a negatively valenced situation (immediate intrusive ruminations, or IIRs) and an index of the severity of intrusive ruminations that occurred in the following 24 hours (retrospective intrusive ruminations, or RIRs) (Luminet, Rimé, & Wagner, 2002). The existing literature does not provide a consensus as regards the most appropriate way to assess intrusive ruminations related to a specific stressful situation. Two different approaches are typically found. The first one (later referred as the “intrusion signalling approach”) investigates intrusive ruminations in the laboratory immediately after participants have been exposed to an emotion-inducing stimulus (e.g., Horowitz, 1969, 1971; Horowitz & Becker, 1971a, 1971b, 1971c, 1973). The second approach (later referred as the “retrospective approach”) investigates the degree of severity of

intrusive ruminations related to personal emotional events using self-report scales. Measures are generally taken some weeks or some months after the event occurred. This approach commonly involves clinical populations with a high prevalence of intrusive rumination (e.g., de Silva & Marks, 1999; Janoff-Bulman, 1989; Rachman & de Silva, 1978; Tait & Silver, 1989; Timko & Janoff-Bulman, 1985; Wortman & Silver, 1987, 1989) but was also conducted with non-clinical populations (e.g., Rimé et al., 1991). If these two approaches are highly correlated, it would indicate that the two categories of research presented above can complement each other rather well in assessing state related intrusive ruminations. The goal of the studies conducted by Luminet et al. (2002) was first to test whether an ecologically valid measure of intrusive rumination can reliably predict a set of self-report measures and second to establish the degree of relationship between the intrusion signalling approach and the retrospective approach.

Participants (N = 61 in study 1 □ N = 41 in study 2) first listened to a negatively valenced situation (testimony of a woman who had been severely injured and burned in a car accident). Pilot investigations showed that the story was able to elicit a moderate level of disruptiveness, that the main emotion involved was sadness and that the story was perceived as highly self-relevant. Next, participants performed an attentional task during which they were asked to press a key on a computer keyboard each time they had a thought or an image related to the story they had heard. This measure was designed to parallel the occurrence of intrusive ruminations in a natural context, i.e., thoughts which interrupt ongoing activities such as working on the attentional task. During the second session, participants completed a set of questionnaires, such as the RIRs. The RIRs is composed of six 7-point scales which were selected as assessing important aspects of intrusive ruminations. They were all related to the occurrence of intrusive ruminations from the time participants left the laboratory to the time they came back to the

laboratory 24 hours later. Scales were about the extent to which the thoughts (1) were vivid, (2) captivated the attention, (3) disrupted people's ongoing activities, (4) entered people's minds suddenly, (5) were difficult to dismiss, and (6) if people actively tried to dismiss the thoughts when they appeared. The internal reliability of the scale was satisfactory ($\alpha = .75$ for study 1, $\alpha = .84$ for study 2). Results showed a positive correlation between IIRs and RIRs, $r = .41, p < .001$ in study 1 and $r = .34, p < .05$ in study 2. The significant relationships obtained suggest that the two types of measures complement each other rather well in assessing intrusive ruminations. Thus, these studies represent a step in filling the gap between the “retrospective approach”, in which people report still having intrusive ruminations several months or years after experiencing highly emotional situations (e.g., Lehman, Wortman, & Williams, 1987; Tait & Silver, 1989), and the “intrusion signalling approach,” in which reports of intrusive ruminations were restricted to the few minutes following an emotional stimulus (e.g., Horowitz, 1969, 1975; Horowitz & Becker, 1971a, 1971b, 1973). The relatively small part of common variance between the IIRS and RIRs measures indicates, however, that they assessed complementary aspects of intrusive ruminations. This suggests that the two approaches for assessing intrusive ruminations are probably worth using together.

Siegle (2001) recently brought additional information on the discriminant and the convergent validity of the RIRs. First, RIRs were related to the RRS (Nolen-Hoeksema & Morrow, 1991), $r = .29, p < .001$ and the RIES factor on intrusion (Horowitz et al., 1979), $r = .47, p < .001$. The relationship with the RRS suggests that RIRs share some similarities with depressive rumination. This suggestion is substantiated by the positive correlation observed between RIRs and the Beck Depression Inventory (Beck et al., 1961), $r = .28, p < .001$. The positive relationship with the intrusion subscale of the RIES is not surprising as both measures

were designed to investigate the degree of intrusiveness of thoughts related to a particular distressing event. Finally, a non-significant relationship was found with the ECQ (Roger & Najarian, 1989), a measure assessing the degree to which individuals inhibit unwanted thoughts, and which is related to trait anxiety. Together these results suggest that RIRs are more related to depressive than to anxious rumination. RIRs are also related to emotion-related measures of rumination (e.g. “How much have you thought about how worried you feel about the event?”), but not to instrumental rumination (e.g., “How much have you thought of ways you could minimize the impact of the event in your life?”).

Critical Evaluation

The two reported studies suggest a stable relation of moderate magnitude between an ecologically valid measure of intrusive ruminations following a stressful situation and a self-report measure assessing the main aspects of intrusive rumination. Further studies should investigate mediational paths such as the role of meta-cognitions in the development of new intrusive ruminations. The implication of the two measures (IIRs and RIRs) for anxious and depressive symptomatology also needs additional investigations, although initial data evidence a stronger relationship with depression.

Instruments Assessing Anxious Intrusive Rumination and their Relationship with Depressive Rumination

Although the focus of the present chapter is on depressive rumination, two instruments developed for assessing anxious rumination are reviewed as they show some substantial relations with depression. A very extensive literature has been devoted to rumination in the context of anxiety disorders, and more specifically to the intrusive component of rumination, which is a key

feature in these disorders. Following Rachman (1981), intrusive ruminations are repetitive, unacceptable or unwanted thoughts, images or impulses that interrupt ongoing activities, are attributed to an internal origin, and are difficult to control. For Horowitz (e.g., 1975) intrusive ruminations are repetitive thoughts that are particularly vivid, occur in a non-voluntary way, interrupt ongoing activities, are difficult to control, and require efforts at suppression. Intrusive ruminations are not restricted to clinical populations such as those with posttraumatic stress disorder or obsessive disorder, but occur in nonclinical populations as well, whatever the intensity of the eliciting event (Horowitz, 1992; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984).

This section starts with a review of the Impact of Event Scale (IES, Horowitz, Wilner, & Alvarez), a scale specifically developed for assessing intrusive thoughts following the exposure to traumatic situations. Then, the Distressing Thought Questionnaire (DTQ, Clark & de Silva, 1985) is briefly presented as it aims to investigate simultaneously individual differences in anxious and depressive intrusive rumination.

Horowitz: Intrusive Rumination and the Cognitive Processing of Trauma

Background

Following Horowitz, being exposed to a stressful situation has two major consequences. First, memories related to the stressful event resurface into people's mind and take the form of intrusive ruminations. Second, people develop avoidance reactions such as thought suppression, denial, or numbness of behavioral responses (Horowitz, 1975). Post-traumatic stress disorder and bereavement are two prototypical situations for the growth of intrusive rumination which can occur for a very extended period of time (Horowitz, 1992).

To account for individual reactions to stressful events, Horowitz (1992) developed a stage reaction model which is structurally organized like the model developed by Piaget (1952) for cognitive development. Stages are characterized by an oscillation between avoidance responses such as numbness or denial and confrontation responses such as intrusive thoughts. The model consider both psychodynamic and cognitive theories of emotional reactions to traumatic events (for a review, see Horowitz, 1992). From a psychodynamic perspective, the model has similarities with Freud's conceptions of working through (e.g., Freud, 1914/1958). Working through is as a process which allows individual to accept previously unconscious aspects and to decrease unpleasant effects of repetitive intrusive thoughts. From a cognitive perspective, intrusive rumination offer opportunities to consider the original event from new perspectives by modifying existing schematas. Horowitz consider "cognitive appraisals" (e.g., Frijda, 1986) as an important predictor of future recovery, particularly for the appraisal of subjective control over the situation (Fairbank, Hansen, & Fitterling, 1991).

The Impact of Event Scale (IES)

Items, reliability, stability, and factor structure. Based on his stage reaction model, Horowitz developed a self-report questionnaire which measures the two central responses to traumatic events, intrusion and avoidance (Horowitz et al., 1979). The scale assesses the current subjective distress related to any life event which occurred in the past days. For each item, people have to report how frequently they experienced the situation described on a scale ranging from "not at all" to "often". The intrusion subscale assesses non-voluntary occurrences, low control and disturbance of ongoing activities. It includes 7 items such as "I thought about it when I didn't mean to", or "Pictures about it popped into my mind". The avoidance subscale is made of 8 items such as "I tried to remove it from memory", or "I tried not to talk about it." The IES-intrusion and

IES-avoidance subscales evidence moderate to high levels of intercorrelations ranging from $r = .42$ to $r = .66$ (Joseph et al., 1996; Schwarzwald et al., 1987; Zilberg et al., 1982). These values suggest different patterns of intrusion and avoidance (high/high; high/low; low/high, or low/low) which can vary with the severity of the stress reactions. The study conducted by Creamer et al. (1992) suggests that the relationship between intrusion and avoidance can change with time. A negative association was found between intrusion measured 8 months after a traumatic situation and avoidance measured 14 months after the trauma. It is possible that when the trauma has been processed there are less reasons to avoid trauma-related stimuli.

The IES is probably the most widely used scale for assessing cognitive and behavioral processes following traumatic situations such as victims of assaults (e.g., Elliott & Briere, 1995), survivors of motor vehicle accidents (e.g., Bryant & Harvey, 1996a), firefighters (e.g., Bryant & Harvey, 1996b), or survivors of natural disasters (e.g., Johnsen, Eid, Lovstad, & Michelsen, 1997). The scale has also been used with children and adolescents (e.g., Green et al., 1994).

Cronbach's α for the whole scale ranges from .73 to .90 (Horowitz et al., 1979; Larsson, 2000; Shalev, 1992; Zilberg et al., 1982), from .78 to .91 for the intrusion subscale, and from .69 to .91 for the avoidance one (Horowitz et al., 1979; Kopel & Friedman, 1997; Robbin & Hunt, 1996; Zilberg et al., 1982). Test-retest reliability has been only reported by Horowitz et al. (1979) after a 1 week follow-up, with $r = .89$ for intrusion and $r = .79$ for avoidance.

The two-factor structure was replicated in studies using exploratory factor analysis (Joseph et al., 1993; Schwarzwald, Olomon, Weisenberg, and Mikulincer, 1987). A recent study using confirmatory factor analysis showed, however, a three factor solution, i.e., intrusion, avoidance, and sleep disturbance (Larsson, 2000). Further studies using confirmatory factor analysis techniques are needed to check how replicable is the three-factor solution.

Validity. The IES evidences predictive validity in discriminating populations exposed to different degrees of stressful events (Schwarzwald et al., 1987). The convergent validity of the scale was supported by positive correlation between IES and measures of psychological distress such as the Beck Depression Inventory (BDI, Beck et al., 1961), the Spielberger State Anxiety Inventory (STAI, Spielberger et al., 1983), or the General Health Questionnaire (GHQ-28, Goldberg & Hillier, 1979), a measure of psychiatric well-being. For instance in a study on survivors from the “Herald of Free Enterprise”’s ship disaster, Joseph et al. (1996) found at a 5 years follow-up a correlation of $r = .54$ with the BDI, and $r = .55$ with the STAI, both $ps < .001$, for the intrusion subscale, and $r = .70$ and $r = .74$ for the avoidance subscale, both $ps < .001$. These results suggest the same relationship of the IES with anxiety and depression symptomatology.

Critical Evaluation

The self-report Impact of Event Scale (IES) is a widely used instrument that assesses the intrusive and the avoidant components of stress responses . The moderate level of correlations between the intrusion and the avoidance subscales suggest that various patterns of responses to trauma can co-occur. The scales shows high internal consistency and test-retest reliability, and convergent validity with expected relationships with measures of distress. Interestingly, the relationship with depression is high, particularly for the avoidance subscale.

The IES has also some shortcomings. First, it can be faked very easily (Lees-Haley, 1990). It will thus be useful in the future to include filler items to make the questionnaire less transparent and items able to detect malingering. Second, there is a lack of norms for diagnostic use of the scale with no consistent support for the ability of the scale to predict the future psychiatric status of patients (e.g., Shalev, 1992). This can be explained, however, by the

functional status given to intrusion and avoidance when measured shortly after the event occurred.

The Distressing Thoughts Questionnaire (DTQ)

Clark and colleagues developed the Distressing Thoughts Questionnaire in order to examine individual differences in the experience of depressive and anxious intrusive thoughts (Clark & de Silva, 1985; Clark & Hemsley, 1985). The DTQ uses items from previous scales which demonstrated the highest differentiation between non-depressed and depressed subjects and between non-anxious and anxious subjects. Six contents of depressive rumination were retained such as “I have thoughts or images that... my future is bleak” or “... that I am a failure” together with six items sampling anxious rumination such as “ I have thoughts or images that something is, or may in the future, be wrong with my health” or “... of the death of a close friend or family member”. For each content, people answered on a list of five cognitive parameters (frequency, sadness, worry, removal, and disapproval). Thus, the DTQ consists of a total of 60 items, half assessing anxious and half assessing depressive thoughts. The internal consistency of both the anxiety ($\alpha = .89$) and the depression subscale ($\alpha = .95$) was high, as well as the test-retest reliability after three months, $r = .67$ for anxiety, $r = .64$ for depression (Clark & de Silva, 1985). An exploratory factor analysis gave a three-factor solution with the first factor assessing depressive aspects, the second anxious dimensions, and the third one was a mixture of items for depression and anxiety.

Results showed that the predictive validity of the depression and the anxiety subscales was rather problematic, however. First, one of the best predictor for the scale assessing frequency of anxious thoughts was frequency of depressive thoughts. Another unexpected finding was that the DTQ depressive statements were more highly related to trait anxiety than

the DTQ anxious ones (Clark & Hemsley, 1985). More specifically, the best predictor of trait anxiety was the frequency of depressive statements experienced by an individual. Finally, the DTQ-depression subscale had greater relationships with an instrument assessing obsessional complaints than the DTQ-anxiety subscale. Together, these results seriously question the ability of the DSQ anxiety and depression subscales to predict unique symptomatology. Rather, it seems that they both tap a single general distress factor. These conclusions are close to the most recent studies conducted with the RRS, which questioned the specificity of that scale to predict depressive symptoms (Nolen-Hoeksema, 2000; Jackson & Nolen-Hoeksema, in press).

Convergences and Divergences in Measures of Rumination

A large number of instruments have been reported up to now with only very few studies examining whether these instruments represent similar aspects of rumination. Recently Siegle (2001) examined convergences and divergences in a large set of self-report measures of rumination. A sample of 189 undergraduate students completed seven measures of rumination. Five of them have been already reviewed in this chapter. They are the Ruminative Responses Scale (RRS) (Nolen-Hoeksema & Morrow, 1991), the Impact of Event Scale (IES) (Horowitz et al., 1979), the questionnaire of meta-cognitive dimensions of depressive and anxious thoughts (Papageorgiou & Wells, 1999), the Retrospective Intrusive Ruminations scale (RIRs) (Luminet et al., 2002) and the Thought Control Questionnaire (TCQ) (Wells & Davies, 1994). The two additional scales were the Multidimensional Rumination Questionnaire (MRQ) (Fritz, 1999) and the rehearsal subscale of the Emotion Control Questionnaire (Roger & Najarian, 1989). The MRQ assesses three types of rumination in response to a stressful event: emotion-focused rumination (e.g., “In the past two weeks, how much have you thought about how worried you feel about the event?”), searching for meaning of negative experiences (e.g., “In the past two

weeks, how much have you found yourself searching to make sense of or find some meaning in the event?"), and instrumental rumination (e.g., "In the past two weeks, how much have you thought of things you need to change in your life as a result of the event?"). The rehearsal subscale of the ECQ includes 14 items such as "I get "worked up" just thinking about things that have upset me in the past".

Siegle (2001) first examined the extent to which these measures index a single construct by using the Generalizability Theory (Matt, in press). Results indicated that both at the scale level and at the item level the instruments used measure different types of rumination rather than a single construct. The inter-correlations between the scales further document these previous results with correlations ranging from .10 to .81. The highest correlations were found among the subscales of the MRQ. High correlations were also found between the RRS and the MRQ subscales on emotion, $r = .50, p < .01$, and on search for meaning, $r = .46, p < .01$, between the RRS and the TCQ subscales on reappraisal, $r = .49, p < .01$ and worry, $r = .44, p < .01$, and between the IES, on the one hand, and the RIRs, $r = .47, p < .01$ and the MRQ subscale on emotion, $r = .45, p < .01$, on the other hand.

The factor structure was then examined by an exploratory principal component analysis in which participant's scores on the ruminations scales were entered. Three factors were retained, explaining 62.5 % of the total variance. Factor 1 represented all scales from the MRQ. Factor 2 included trait-related measures of rumination such as the RRS, the TCQ subscales on worry, punishment and reappraisal. Factor 3 typically assessed state-related dimensions of ruminations, including the IES, the questionnaire of meta-cognitive dimensions of depressive and anxious thoughts and the Retrospective Intrusive Ruminations scale (RIRs).

The relationship of these scales with depression symptomatology was assessed by administering the BDI to the all sample. A multiple regression analysis was performed in which all the rumination scales served as potential predictors of depression. Highest semi-partial correlations with BDI were found for the RRS, the TCQ subscale on reappraisal and the ECQ subscale on rehearsal. Together, the rumination scales explained 36.4 % of the variation in dysphoria, 25 % being accounted by the RSQ on its own.

Critical Evaluation

Overall, the results found by Siegle (2001) suggest that studies investigating rumination by using single scales need to specify the type of rumination being examined . When investigating broad aspects of rumination, a battery of several scales is highly recommended. Techniques which aggregate scales also offer a more internally consistent solution than examining the scales separately. Finally, although the different scales examined share some variance with depression, they investigate distinct content and processes.

Conclusions

This chapter started with an extensive review of two instruments which are specifically intended to measure depressive rumination. Both the RRS and the RSS evidenced internal consistency and test-retest reliability. The scales differ in the content of depressive rumination considered. In the RSS, the items are only related to the ideation part of rumination while in the RRS other aspects are considered such as disclosing sadness to others. The specificity of the RSS is supported by a one-factor solution while the broader range of aspects involved in the RRS resulted in a three factors solution. The first data on the RSS suggest a higher relationship with depression than for the RRS. Recent investigations on the RRS even suggest that people scoring high on the scale are equally likely to be anxious or depressed and that the highest scores are

found in people presenting a mixed anxiety/depression symptomatology. These results indicate that the border between anxious and depressive rumination is not easy to be delineated. It is thus possible that a ruminative style represents a vulnerability factor for emotional disorders in general. Finally, predictive validity has only been investigated extensively for the RRS. The studies reported emphasize the role of the social context in the development of depressive rumination. They also distinguish direct effect of rumination style on depressive symptomatology from indirect effects mediated by the rumination style.

Measures of meta-cognitions in depressive rumination represent a promising area which help to understand the maintenance of rumination and the shift from functional to dysfunctional rumination. The scales do not focus on the styles of responses when in a depressed mood but rather on particular strategies people develop in reaction to the negative feelings triggered by their ruminations. Erroneous beliefs about how beneficial or how detrimental ruminations are for mental health play a central role in predisposing people towards rumination. In this regard, the Positive Beliefs about Rumination Scale (PBRS-R) and the Negative Beliefs about Rumination Scale (NBRS) represent two promising tools for the assessment of depressive rumination.

Most measures of depressive rumination are self-report scales. Future investigations need to focus on indirect measures, which rely less on introspective abilities. More ecologically valid techniques are necessary, using indirect techniques. Self-report measures are still important as they are easy to administer to large groups. However, confidence in self-reports will be warranted only if they evidence positive and significant relationships with indirect measures. The goal of future investigations should also be to assess the concurrent validity of existing scales, rather than the development of new scales. The study conducted by Siegle (2001) clearly emphasized the lack of convergences in the self-report measures of depressive rumination. Statistical techniques

now allow to aggregate items from different scales. It should result in the near future to the development of new scales which assess depressive rumination more exhaustively.

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Footnotes

1. The Goodness of Fit Index (GFI) estimates the extent to which the sample variances and covariances are reproduced by the hypothesised model. The Adjusted Goodness of Fit (AGFI) simply adjusts the GFI value for degrees of freedom. A GFI which exceeds .90 and an AGFI which exceeds .85 are commonly used as indications of a good fit (Stevens, 1996). Steiger's root mean square error of approximation (RMSEA, see Steiger, 1990) evaluates the discrepancy per df between the model and the data was. Practical experience has led researchers to consider that a value of the RMSEA equal or inferior to .05 indicates a close fit of the model in relation to the degrees of freedom (Browne and Cudeck, 1993).
2. It is important to note however, that in the longitudinal study conducted by Just and Alloy (1997) the ruminative response style predicted the onset of clinically significant depressive episodes and not just mild depressive symptoms and the severity of the first depressive episode.
3. Results showed that while the first (GFI = .84, AGFI = .78, RMSEA = .128) and the second (GFI = .80, AGFI = .73, RMSEA = .121) model had inadequate indices, the third model presented high indices of fit (GFI = .95, AGFI = .91, RMSEA = .062) except for the RMSEA, which was slightly above the required threshold of .05.