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Repetitive Negative Thinking as a Transdiagnostic Process

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The current paper provides an updated review of repetitive negative thinking as a transdiagnostic process. It is shown that elevated levels of repetitive negative thinking are present across a large range of Axis I disorders and appear to be causally involved in the maintenance of emotional problems. As direct comparisons of repetitive negative thinking between different disorders (e.g., GAD-type worry and depressive rumination) have generally revealed more similarities than differences, it is argued that repetitive negative thinking is characterized by the same process across disorders, which is applied to a disorder-specific content. On the other hand, there is some evidence that—within given disorders—repetitive negative thinking can be reliably distinguished from other forms of recurrent cognitions, such as obsessions, intrusive memories or functional forms of repeated thinking. An agenda for future research on repetitive negative thinking from a transdiagnostic perspective is presented.

Individuals with different emotional disorders report excessive and repetitive thinking about their current concerns, problems, past experiences or worries about the future. Such *repetitive negative thinking* (RNT) is found across diverse problems including affective disorders, anxiety disorders, insomnia or psychosis, which is why Harvey and colleagues (2004) proposed RNT as a definite transdiagnostic process. The aim of the present article will be to provide an update on the earlier review by Harvey et al. (2004). This update appears timely as there has been an increase in studies investigating RNT in different emotional disorders in recent years, with more than 50 new empirical studies since the Harvey et al. (2004) review. In addition to reviewing the current evidence for the presence of RNT across disorders, this review will furthermore aim to (a) propose a working definition of this process, (b) summarize the results of studies that have directly compared different forms of repetitive negative thinking, (c) describe characteristics of repetitive negative thinking across disorders, (d) summarize evidence regarding the

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causal role of this process in the maintenance of emotional problems and (e) suggest an agenda for future research on repetitive negative thinking from a transdiagnostic perspective.

HOW CAN REPETITIVE NEGATIVE THINKING BE DEFINED TRANSDIAGNOSTICALLY?

A useful starting point for the examination of RNT as a transdiagnostic process is to test whether it is possible to define this phenomenon in a way that can be applied across disorders. Given the strong disorder-focus in the current literature, several disorder-specific definitions co-exist. For example, the most influential definition of rumination in depression characterizes this process as “repetitive and passive thinking about one’s symptoms of depression and the possible causes and consequences of these symptoms” (Nolen-Hoeksema, 2004, p. 107). Worry in generalized anxiety disorder (GAD) has most commonly been defined as “a chain of thoughts and images, negatively affect-laden and relatively uncontrollable. The worry process represents an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes” (Borkovec, Robinson, Pruzinsky, & DePree, 1983, p. 10). In the literature on rumination in posttraumatic stress disorder (PTSD), this process is described as repetitive and recurrent negative thinking about the trauma and/or its consequences (Michael, Halligan, Clark, & Ehlers, 2007), whereas rumination in social phobia is defined as “repetitive thoughts about subjective experiences during a recent social interaction, including self-appraisals and external evaluations of partners and other details involving the event” (Kashdan & Roberts, 2007, pp. 285–286). This process is also often referred to as ‘post-event processing’ (see Clark & Wells, 1995). A comparison of these definitions shows that they agree on three different characteristics: All describe the thinking process as (a) *repetitive*, (b) *passive* and/or *relatively uncontrollable* and (c) focused on *negative content*. On the other hand, the definitions differ considerably regarding the exact content the thinking is supposed to be focused on (e.g., symptoms of depression; future negative events; past traumas or recent social situations). As a whole, it appears possible to define RNT by the three process characteristics that are common to all definitions, namely as repetitive thinking about one or more negative topics that is experienced as difficult to control (see similar arguments by Segerstrom, Tsao, Alden, & Craske, 2000; Watkins, 2008).

IS REPETITIVE NEGATIVE THINKING A TRANSDIAGNOSTIC PROCESS?

In their review, Harvey et al. (2004) classified RNT as a definite transdiagnostic process as they found strong evidence for its presence in a whole range of disorders. Our update of this review shows that this statement is still valid as there is currently evidence for elevated levels of RNT in as much as 13 different disorders, including *depression* (for a review see Thomsen, 2006; Watkins, 2008), *PTSD* (e.g., Clohessy & Ehlers, 1999; Ehring, Ehlers, & Frank, in press), *social phobia* (e.g., Abbott & Rapee, 2004; Joormann, Dkane, & Gotlib, 2006), *obsessive-compulsive disorder (OCD)* (e.g., Abramowitz, Whiteside, Kalsy, & Tolin, 2003; Amir, Cashman, & Foa, 1997), *insom-*

nia (for a review see Harvey, 2002), *eating disorders* (e.g., Nolen-Hoeksema, Stice, Wade, & Bohon, 2007; Sassaroli et al., 2005), *pain disorder* (e.g., Eccleston, Crombez, Aldrich, & Stannard, 2001; Sullivan, Bishop, & Pivik, 1995), *hypochondriasis* (Fink et al., 2004), *alcohol use disorder* (Nolen-Hoeksema & Harrell, 2002; Nolen-Hoeksema et al., 2007), *psychosis* (e.g., Freeman & Garety, 1999; Morrison & Wells, 2007) and *bipolar disorder* (e.g., Thomas & Bentall, 2002; Thomas, Knowles, Tai, & Bentall, 2007; however, note that individuals with bipolar disorder also appear to show a form of repetitive *positive* thinking that might be involved in the maintenance of mania, see Johnson, McKenzie, & McMurrich, in press). In addition, RNT in the form of worry is a central feature of *GAD* and worry related to panic attacks is part of the diagnostic criteria for *panic disorder* (APA, 1994). Taken together, with only few exceptions, there is evidence of the presence of RNT for nearly all Axis I disorders compared to non-disordered controls, which clearly supports its classification as a definite transdiagnostic process.

One possible implication of this finding is that it should be more promising to study RNT across disorders rather than focusing on its role in different emotional disorders separately. However, on the other hand, one could argue that the mere presence of a certain process in different disorders is only a necessary but not yet a sufficient condition for moving away from a disorder-focused perspective. If despite being present in different disorders, the exact nature of RNT turns out to differ considerably between diagnostic groups, this could still justify the maintenance of a disorder-specific focus. On the other hand, a truly transdiagnostic process should show very similar process characteristics across a range of disorders. In the remainder of this article, the issues of similarities vs. differences of RNT across disorders as well as the causal status of RNT in the maintenance of emotional problems will therefore be reviewed.

DIFFERENT FORMS OF REPETITIVE NEGATIVE THINKING—SAME OR DIFFERENT PROCESSES?

Most theorists in the field of RNT appear to agree that the different forms of RNT that have originated within disorder-focused research (e.g., rumination in depression; worry in *GAD*) show a high degree of overlap and are highly correlated. However, there is some debate as to whether they should be treated as the same process that is applied to different disorder-specific contents (e.g., Segerstrom et al., 2000) or whether they should be regarded as related but nevertheless distinct processes (e.g., Papageorgiou & Wells, 1999). Most of this controversy has focused on the relationship between *GAD*-type worry and depressive rumination.

Worry vs. Rumination

Three different studies have investigated the relationship between worry and rumination by comparing the standardized questionnaire measures of these two processes (Penn State Worry Questionnaire, PSWQ vs. Response Styles Questionnaire, RSQ, respectively). Results from these studies show (1) a high correlation between worry and rumination measures, (2) evidence from structural equation modeling that measures of worry and rumination load on a common factor and (3) evidence that both forms of

RNT are similarly related to symptom levels of anxiety and depression (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Segerstrom et al., 2000; Siegle, Moore, & Thase, 2004). Taken together, the results support the view that worry and rumination share a common process. Nevertheless, two of the studies report additional results that could also be interpreted in a different way, namely (a) worry and rumination items loaded on separate factors in one of the studies (Fresco et al., 2002; however, note that this was not replicated by Siegle et al., 2004) and (b) results of analyses based on generalizability theory showed that a large amount of the variance could be accounted for by “person \times instrument” interactions, which the authors interpreted as a sign that there are important differences in individuals’ responses across scales (Siegle et al., 2004). However, although these findings might point towards differences between measures of worry and rumination, it remains unclear from these studies whether these exclusively reflect differences in the *content* of thinking or also differences in *process*. Moreover, findings based on factor analyses of questionnaire items generally need to be treated with caution because the grouping of items within a factor analysis can reflect methodological artifacts such as item confounds and criterion contamination (e.g., that items with the word “worry” in them are often completed similarly and distinct from items that include the word “rumination”), whether or not there genuinely exist underlying higher-levels dimensions.

A different approach to studying the similarities vs. differences of worry and rumination was used in three additional studies. Here, non-clinical participants were asked to describe process characteristics of worry vs. rumination by rating examples of worry and rumination on a range of dimensions (Papageorgiou & Wells, 1999; Watkins, 2004b; Watkins, Moulds, & Mackintosh, 2005). In all three studies, very few differences between the two forms of RNT were found. For example, of the 53 dimensions studied by Watkins et al. (2005), only seven showed significant differences between worry and rumination. Papageorgiou and Wells (1999) found significant differences on five out of 17 dimensions; however, only one of these (rumination being focused more on the past) was replicated by Watkins et al. (2005), whereas all others did not show significant differences in the latter study. Overall, the results from these three studies again mainly support the idea that worry and rumination are very similar processes with the temporal orientation adopted during RNT as the only stable difference: worry was predominantly focused on the future, whereas rumination was predominantly focused on the past. A recent experimental study also showed very similar effects of induced worry vs. rumination on mood and the amount of verbal processing vs. imagery experienced (McLaughlin, Borkovec, & Sibrava, 2007; however, note that complex interactive effects of worry and rumination on mood states also emerged in this study). Moreover, experimental manipulations of worry and rumination robustly find that both increase levels of anxiety as well as depression (e.g., Behar, Zullig, & Borkovec, 2005; Blagden & Craske, 1996; McLaughlin et al., 2007), further indicating their similarities in terms of process and function.

In sum, although using different methodological approaches, studies directly comparing worry and rumination have revealed more similarities than differences between these processes. There are no clear criteria to judge whether the small number of differences found, most of which have not yet been replicated across studies, should be interpreted as evidence for different processes or not. However, it can be argued that in such a situation, preference should be given to the more parsimonious hypothesis, namely

that worry and rumination share the same process and only differ in content (e.g. temporal orientation), until there is stronger evidence for differences on relevant dimensions (see also Field and Cartwright-Hatton, 2008, this issue).

RNT vs. Other Forms of Recurrent Cognitions in Emotional Disorders

Whereas it appears reasonable to assume that worry and rumination share a common process, there is preliminary evidence that RNT can be distinguished from other types of recurrent cognitions found in emotional disorders. Firstly, worry and obsessive thoughts have been shown to differ on a number of dimensions. For example, using factor analytic procedures, studies have typically found standardized measures of worry and obsessions to load on clearly distinct, albeit correlated, factors in non-clinical and clinical samples (e.g., Freeston et al., 1994; Van Rijsoort, Emmelkamp, & Vervaeke, 2001). In addition, studies directly comparing self-reported characteristics of worry vs. obsessions in non-clinical samples found the two processes to differ on most dimensions, including frequency, duration, emotions triggered and appraisals (Clark & Claybourn, 1997; Langlois, Freeston, & Ladouceur, 2000a, 2000b; Wells & Morrison, 1994). Results from a recent study comparing rumination and obsessions in patients with OCD and depression suggest that similar differences are also found in clinical samples (Wahl, 2007). Taken together, worry and obsessions appear to show some differences in their presentation. Again, however, we need to be cautious about interpreting *process* from only questionnaire-based studies, since questionnaires depend upon self-report and thus are better at assessing thought content than thought process, which individuals may not be consciously aware of or able to monitor on-line. Convergent data from on-line information processing studies and experimental manipulations is necessary before strong conclusions about differences in process can be drawn. Furthermore, it is important to note that this distinction is not primarily one *between* different psychological disorders but rather applies *within* these disorders as well as non-clinical populations. That is, individuals with OCD show elevated levels of RNT in the form of worry and rumination similar to those seen in other emotional disorders (e.g., Abramowitz et al., 2003; Amir et al., 1997; Wahl, 2007); however, these need to be distinguished from obsessive thoughts.

Secondly, a number of studies have compared trauma-related rumination versus intrusive memories in individuals with PTSD. Although the severity of intrusive memories and rumination were significantly correlated, the two types of recurrent cognitions were also found to show different characteristics, including their quality (sensory impressions vs. verbal thoughts) and duration (seconds to minutes vs. minutes to hours) (Evans, Ehlers, Mezey, & Clark, 2007; Michael et al., 2007; Speckens, Ehlers, Hackmann, Ruths, & Clark, 2007). In addition, it appears important to note that they represent different types of cognitions (memories vs. evaluative thoughts). The results from studies using interview measures, as described above, are also supported by two recent experimental studies with non-clinical and subclinical participants, in which worry and trauma recall were found to be clearly distinguishable on a process level (Behar et al., 2005). In addition to obsessive thoughts, intrusive trauma-related memories therefore also appear to show phenomenological differences to RNT (e.g., worry, rumina-

tion) and can possibly be classified as a distinct, albeit correlated, type of repetitive cognition. However, as in the case of obsessions, this distinction is primarily one between different processes *within* rather than *between* disorders as trauma survivors with PTSD typically show both trauma-related rumination, which can be classified as a form of RNT, as well as intrusive memories, which appear to be a different process (see also Harvey et al., 2004 for evidence that intrusive memories are also found across a range of disorders).

Functional vs. Dysfunctional Forms of Repetitive Thinking

A number of studies have identified different forms of repetitive thinking that can be distinguished regarding the degree to which they are related to functional vs. dysfunctional outcomes (for a review see Watkins, 2008). For example, Treynor and colleagues derived two factors from the standard measure of depressive rumination (RSQ), whereby the first one ('brooding') was found to be positively correlated with both concurrent and prospective depression, while the second one ('reflective pondering') showed a negative relationship with prospective depressive symptoms (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Somewhat related distinctions have been suggested by other authors (e.g., Segerstrom, Stanton, Alden, & Shortridge, 2003; Trapnell & Campbell, 1999). Furthermore, experimental studies have found that in depressed patients, repetitive self-focus characterized by more concrete, experiential processing has more beneficial outcomes (e.g., more specific memory recall, better problem solving) than repetitive self-focus characterized by abstract, evaluative processing (Watkins & Moulds, 2005a; Watkins & Teasdale, 2001, 2004).

CHARACTERISTICS OF REPETITIVE NEGATIVE THINKING ACROSS DISORDERS

As reviewed so far, there is evidence for a transdiagnostic dysfunctional process of RNT that is present across a range of disorders and can be distinguished from other types of recurrent cognitions (e.g., obsessions, intrusive memories) and functional forms of repetitive thinking. In the following, studies investigating further characteristics of RNT across disorders will be summarized.

Thought vs. Imagery. There is evidence showing that naturally occurring as well as experimentally induced worry is characterized by a predominance of verbal thoughts as opposed to imagery (e.g. Borkovec & Inz, 1990; Freeston, Dugas, & Ladouceur, 1996), which has been linked to the assumed avoidance function of worry in theoretical accounts of GAD (Borkovec, Alcaine, & Behar, 2004). Studies investigating the amount of verbal processing vs. imagery in RNT across disorders show that the same appears to apply to RNT in individuals with depression (Watkins & Baracaia, 2001; Watkins et al., 2005), PTSD (Evans et al., 2007; Speckens et al., 2007) and insomnia (Nelson & Harvey, 2003; see also Nelson & Harvey, 2002, for an experimental study). As reviewed earlier, the predominance of verbal thoughts has been found to be one of the variables distinguishing RNT from obsessions and intrusive memories.

Abstractness vs. Concreteness of Thinking. In addition to being predominantly verbal, RNT has also been suggested to be characterized by a particularly abstract style of

processing information that is thought to be responsible for some of its observed negative consequences, e.g., impaired problem solving, reduced imagery and inhibited emotional processing (see Stöber, 1998). This hypothesis was first successfully tested in the context of worry and GAD (Stöber & Borkovec, 2002; Stöber, Tepperwien, & Staak, 2002). However, there is evidence that this equally applies to depressive rumination (Watkins & Moulds, 2007) and possibly also trauma-related rumination (Ehring et al., in press; Ehring, Szeimies, & Schaffrick, submitted). Importantly, experimental evidence shows that this dimension is causally involved in negative effects of RNT on emotional processing, problem solving and overgeneral autobiographical memory (e.g., Watkins, 2004a, 2008; Watkins & Moulds, 2005a; Watkins & Teasdale, 2001, 2004).

Role of Meta-Cognitive Beliefs. Wells (1995) has emphasized the role of meta-cognitive processes in RNT, whereby positive meta-cognitive beliefs (e.g., RNT being beneficial for problem solving or gaining insight) are thought to be involved in the initiation of episodes of RNT, which in turn activates negative meta-cognitive beliefs (e.g., RNT being potentially harmful) that then leads to dysfunctional attempts to control the thoughts. In line with this view, there is evidence that both types of meta-cognitive beliefs are related to levels of RNT and/or symptom severities in GAD (e.g., Wells & Carter, 1999, 2001) and depression (e.g., Papageorgiou & Wells, 2003; Watkins & Baracaia, 2001; Watkins & Moulds, 2005b). On the other hand, only positive meta-cognitive beliefs appear to be involved in RNT in insomnia (Harvey, 2003) and no association between meta-cognitive beliefs and rumination was found in PTSD (Michael et al., 2007). Moreover, an important caveat concerning the role of meta-cognitive beliefs in RNT is the acknowledgement that, to date, these studies have only been correlational. In the absence of prospective longitudinal studies or experimental manipulations of these variables, there is no evidence confirming the causal nature of meta-cognitive beliefs.

Content. The content of RNT consistently differs between disorders in a way that reflects individuals' disorder-specific current concerns. Whereas in some disorders, repetitive thinking is typically focused on a very specific topic, e.g. the trauma in PTSD (e.g., Speckens et al., 2007) or the individual's performance in recent social situations in social anxiety (e.g., Kashdan & Roberts, 2007), patients suffering from other disorders, such as GAD, report RNT to cover a range of topics, although all are related to a theme of threat (e.g., Becker, Goodwin, Holting, Hoyer, & Margraf, 2003). As already described earlier, one possibly relevant dimension for distinguishing the content of RNT appears to be its temporal orientation in that some disorders are characterized by RNT about the future (e.g., GAD; Borkovec et al., 1983), others by RNT about the past or present (e.g., depression; Watkins et al., 2005, Watkins & Baracaia, 2001) and again others by RNT about past, present and future alike (e.g., PTSD; Speckens et al., 2007).

THE CAUSAL ROLE OF RNT IN THE MAINTENANCE OF EMOTIONAL DISORDERS

There is evidence from a number of studies showing that RNT appears to play a causal role in the development and/or maintenance of psychological disorders (for a review see Watkins, 2008). In prospective studies, levels of depressive rumination were found to (a) predict the future onset of a major depressive episode across a range of follow-up pe-

riods, (b) predict the severity of depressive symptoms in initially nondepressed individuals after controlling for baseline symptoms and (c) predict depressive symptoms in patients with clinical depression after controlling for baseline depression as well as (d) mediate the effect of other risk factors on the onset of depression (e.g., Just & Alloy, 1997; Kuehner & Weber, 1999; Nolen-Hoeksema, 2000; Nolen-Hoeksema, Parker, & Larson, 1994; Spasojevic & Alloy, 2001). Similarly, RNT in the form of worry and/or rumination has been found to predict future levels of anxiety (e.g., Segerstrom et al., 2000; Siddique, LaSalle-Ricci, Glass, Arnkoff, & Diaz, 2006), a diagnosis and symptom severities of PTSD (e.g., Ehrling et al., in press; Murray, Ehlers, & Mayou, 2002), persecutory delusions (Startup, Freeman, & Garety, 2007) and symptom levels of bulimia and alcohol use (Nolen-Hoeksema et al., 2007), even after controlling for initial symptom levels.

The causal role of RNT in the maintenance of emotional disorders is further supported by experimental studies in which RNT is induced. The most extensive evidence comes from studies looking at rumination in depression, which have shown that experimentally induced rumination exacerbates already existing dysphoric mood as well as negatively impacts on a multitude of processes that can in turn be expected to contribute to the maintenance of depression, such as increased negative thinking, impaired concentration and poorer problem solving (for a review see Lyubomirsky & Tkach, 2004). Similarly, experimentally induced worry was found to increase levels of anxiety and depression (e.g., Behar et al., 2005; Blagden & Craske, 1996; McLaughlin et al., 2007), experimentally induced worry and rumination about a gruesome film or distressing personal events to lead to increased levels of analogue PTSD symptoms, such as intrusive memories and anxious mood (Ehrling, Fuchs, & Klaesener, submitted; Wells & Papageorgiou, 1995) and experimentally induced pre-sleep worry and rumination on sleep parameters and symptoms of distress (Guastella & Moulds, 2007; Nelson & Harvey, 2002).

CONCLUSIONS AND PROPOSED RESEARCH AGENDA

The updated review presented in this article clearly confirms Harvey et al.'s (2004) earlier suggestion that repetitive negative thinking is a transdiagnostic process. Whereas RNT has initially nearly exclusively been studied in the context of depression and GAD, there is now evidence that RNT is being present in nearly all Axis I disorders. In addition, results from prospective as well as experimental studies suggest that RNT is causally involved in the maintenance of several emotional disorders. These studies have been conducted in the context of a number of different disorders, including depression, GAD, PTSD, insomnia and psychosis.

The question of whether RNT across the different disorders should be regarded as one single process with identical phenomenological and functional properties cannot yet be conclusively answered as the available evidence on this issue is limited. However, converging evidence from studies using different methodological approaches suggests that at least the two most prototypical types of RNT, namely worry and depressive rumination, show many more similarities than differences. It therefore appears reasonable to adopt the parsimonious hypothesis that worry and rumination share an identical process. In addition to being repetitive, difficult to control and negative in content, this pro-

cess appears to be predominantly verbal, relatively abstract and possibly related to positive and negative meta-cognitions. There is preliminary evidence that these process characteristics are not only shared by GAD-type worry and depressive rumination, but also trauma-related rumination in PTSD and pre-sleep cognitive activity in insomnia, which underlines the justification of classifying it as a transdiagnostic process. The only consistently found disorder-specific characteristic of RNT refers to its content or, on a more abstract level, its temporal orientation.

The argument that RNT shows the same process characteristics across disorders is consistent with the idea that repetitive thinking can be an adaptive and normal process, such that there should be commonalities between RNT in psychologically healthy controls and RNT in psychological disorders, reflecting dimensional rather than categorical differences. One implicit assumption of the transdiagnostic approach is that a process is found in multiple disorders because it reflects a normative process also found in healthy controls (i.e., a continuum-dimensional approach to psychological disorders, with the same basic processes and mechanisms active in both normal controls and patients, but in a more extreme form in patients). Cognitive models of RNT propose that RNT is triggered and driven by unresolved goals, such that repetitive thoughts reflect personal concerns and goals that have not yet been successfully attained (Martin & Tesser, 1989, 1996). Thus, the process underpinning RNT—the presence of important, unresolved goals—may be the same in the psychologically healthy and those with psychological disorders. However, since individuals with psychological disorders may have more extreme, unattainable, or perfectionistic goals, they may be more prone to getting stuck in RNT (see Carey, this volume, for a related goal-directed account). The same can be supposed to be true for currently healthy individuals who are vulnerable to developing emotional problems as RNT has also been found to predict a future onset of emotional disorders, such as depression (e.g., Just & Alloy, 1997). Furthermore, such a goal-discrepancy theory can account for the differences in the content of RNT between different disorders: different disorders are characterized by different goals and concerns, which would be reflected in the nature of the RNT.

Whereas hardly any differences in process characteristics of RNT *between* disorders have been found, there is some preliminary evidence showing that different types of recurrent cognitions can be distinguished *within* disorders. RNT as described above appears to show important differences to obsessions as well as intrusive negative memories. Obsessive thoughts and intrusive memories are therefore suggested not to be classified as forms of RNT. In addition, there is emerging evidence that repetitive thinking can have both constructive and unconstructive consequences. In line with Harvey et al. (2004), this pattern of results suggests that future research should focus more on comparing different transdiagnostic processes across disorders rather than focusing on differences between different diagnostic groups.

Despite an increasing interest in the process of RNT in the clinical literature, research adopting a truly transdiagnostic perspective on this topic is still sparse. A number of directions for future research appear promising. First, the investigation of RNT from a transdiagnostic perspective is still complicated by the fact that most available questionnaire measures are focused on thought content, which appears to be disorder-specific, rather than the characteristic process present across disorders. It therefore appears necessary to further develop and validate transdiagnostic measures of RNT. We are aware of four different measures that have been developed with this aim, namely the Cam-

bridge Exeter Repetitive Thought Scale (Barnard, Watkins, Mackintosh, & Nimmo-Smith, 2007), the Habit Index of Negative Thinking, (HINT; Verplanken, 2006) the Perseverative Thinking Questionnaire (PTQ, Ehring, 2007) and the Scott–McIntosh Rumination Inventory (Scott & McIntosh, 1999). While all these measures have the common aim of trying to assess RNT without referring to a disorder-specific content, they differ regarding the exact way in which RNT is conceptualized. Future studies will need to thoroughly evaluate these instruments regarding their performance across different emotional disorders. Second, as most current evidence regarding similarities vs. differences of different types of RNT is based on non-clinical samples, future research should compare RNT in different diagnostic groups in order to critically test the view that the same process characteristics can be found across disorders. Third, whereas the evidence for a role of RNT is very strong in some disorders, it is still underresearched in others. More research is needed to establish the causal role of this process, for example, in OCD, social phobia, PTSD and eating disorders. In addition, it is unclear whether elevated levels of RNT can also be found in axis II disorders, although there is preliminary evidence indicating a relationship between depressive rumination and behaviors characteristic of borderline personality disorder (Smith, Grandin, Alloy, & Abramson, 2006). Fourth, in order to better understand the nature and effects of RNT, it appears necessary to investigate (a) why individuals engage in RNT despite its negative effects, (b) how functional and dysfunctional forms of RNT can reliably be distinguished and (c) what factors determine the repetitive nature of this process. Specifically, more experimental studies are needed, in which supposedly critical dimensions are manipulated, e.g. degree of abstractness, evaluative vs. experiential styles, degree of emotion activation. Fifth, as described above, it appears promising to use the goal-discrepancy model as a theoretical background for studying RNT transdiagnostically as well as comparing RNT in clinical vs. non-clinical groups. Future research should also contrast this view with other hypotheses regarding processes underlying RNT, such as an unwillingness to experience negative thoughts, feelings or bodily sensations (*experiential avoidance*; Hayes, Wilson, Gifford, & Follette, 1996), attempts to use only one set of goals for the control of behavior while ignoring other relevant goals (*arbitrary control*; Mansell, 2005; Powers, 1973), positive and negative meta-cognitions (Wells, 1995) or negative affectivity (Clark & Watson, 1991). Finally, given the widespread presence of RNT across disorders and evidence regarding its causal role in the maintenance of emotional problems, the development and evaluation of transdiagnostically applicable treatment strategies for RNT appears timely (see Watkins et al., 2007).

REFERENCES

- Abbott, M. J., & Rapee, R. M. (2004). Post-event rumination and negative self-appraisal in social phobia before and after treatment. *Journal of Abnormal Psychology, 113*, 136–144.
- Abramowitz, J. S., Whiteside, S., Kalsy, S. A., & Tolin, D. F. (2003). Thought control strategies in obsessive-compulsive disorder: A replication and extension. *Behaviour Research and Therapy, 41*, 529–540.
- Amir, N., Cashman, L., & Foa, E. B. (1997). Strategies of thought control in obsessive-compulsive

- sive disorder. *Behaviour Research and Therapy*, 35, 775–777.
- APA (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, D.C.: American Psychiatric Association.
- Barnard, P. J., Watkins, E. R., Mackintosh, B., & Nimmo-Smith, I. (2007). *Getting stuck in a mental rut: Some process and experiential attributes*. Paper presented at the BABCP Annual Conference, Brighton, 13–15 September 2007.
- Becker, E. S., Goodwin, R., Holting, C., Hoyer, J., & Margraf, J. (2003). Content of worry in the community: What do people with generalized anxiety disorder or other disorders worry about? *Journal of Nervous and Mental Disease*, 191, 688–691.
- Behar, E., Zullig, A. R., & Borkovec, T. D. (2005). Thought and imaginal activity during worry and trauma recall. *Behavior Therapy*, 36, 157–168.
- Blagden, J. C., & Craske, M. G. (1996). Effects of active and passive rumination and distraction: A pilot replication with anxious mood. *Journal of Anxiety Disorders*, 10, 243–252.
- Borkovec, T. D., Alcaine, O. M., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. In R. G. Heimberg, C. L. Turk & D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 77–108). New York, NY: Guilford.
- Borkovec, T. D., & Inz, J. (1990). The nature of worry in generalized anxiety disorder: A predominance of thought activity. *Behaviour Research and Therapy*, 28, 153–158.
- Borkovec, T. D., Robinson, E., Pruzinsky, T., & DePree, J. A. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research and Therapy*, 21, 9–16.
- Clark, D. A., & Claybourn, M. (1997). Process characteristics of worry and obsessive intrusive thoughts. *Behaviour Research and Therapy*, 35, 1139–1141.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg & D. A. Liebowitz (Eds.), *Social phobia: Diagnosis, assessment and treatment* (pp. 69–93). New York: Guilford.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, 100, 316–336.
- Clohessy, S., & Ehlers, A. (1999). PTSD symptoms, response to intrusive memories and coping in ambulance service workers. *British Journal of Clinical Psychology*, 38, 251–265.
- Eccleston, C., Crombez, G., Aldrich, S., & Stannard, C. (2001). Worry and chronic pain patients: A description and analysis of individual differences. *European Journal of Pain*, 5, 309–318.
- Ehring, T. (2007). *Development and validation of a content-independent measure of perseverative thinking*. Paper presented at the V World Congress of Behavioural and Cognitive Therapies, Barcelona, 13 – 15 July 2007.
- Ehring, T., Ehlers, A., & Frank, S. (in press). The role of rumination and reduced concreteness in the maintenance of PTSD and depression following trauma. *Cognitive Therapy and Research*.
- Ehring, T., Fuchs, N., & Klaesener, I. (submitted). The effects of experimentally induced rumination versus distraction on analogue posttraumatic stress symptoms.
- Ehring, T., Szeimies, A.-K., & Schaffrick, C. (submitted). *An experimental analogue study into the role of abstract thinking in trauma-related rumination*. Paper presented at the V World Congress of Behavioral and Cognitive Therapies, Barcelona, 11–14 July 2007.
- Evans, C., Ehlers, A., Mezey, G., & Clark, D. M. (2007). Intrusive memories and ruminations related to violent crime among young offenders: Phenomenological characteristics. *Journal of Traumatic Stress*, 20, 183–196.
- Field, A. P., & Cartwright-Hatton, S. (2008). Shared and unique cognitive factors in social anxiety. *International Journal of Cognitive Therapy*, 1(3), 206–222.
- Fink, P., Ornbol, E., Toft, T., Sparle, K. C., Frostholt, L., & Olesen, F. (2004). A new, empirically established hypochondriasis diagnosis. *American Journal of Psychiatry*, 161, 1680–1691.
- Freeman, D., & Garety, P. A. (1999). Worry, worry processes and dimensions of delusions: An exploratory investigation of a role for anxiety processes in the maintenance of delusional distress. *Behavioural and Cognitive Psychotherapy*, 27, 47–62.
- Freeston, M. H., Dugas, M. J., & Ladouceur, R. (1996). Thoughts, images, worry, and anxiety. *Cognitive Therapy and Research*, 20, 265–273.
- Freeston, M. H., Ladouceur, R., Rheaume, J., Letarte, H., Gagnon, F., & Thibodeau, N. (1994). Self-report of obsessions and worry. *Behaviour Research and Therapy*, 32, 29–36.
- Fresco, D. M., Frankel, A. N., Mennin, D. S., Turk, C. L., & Heimberg, R. G. (2002). Distinct and overlapping features of rumination and worry:

- The relationship of cognitive production to negative affective states. *Cognitive Therapy and Research*, 26, 179–188.
- Guastella, A. J., & Moulds, M. L. (2007). The impact of rumination on sleep quality following a stressful life event. *Personality and Individual Differences*, 42, 1151–1162.
- Harvey, A. G. (2002). Trouble in bed: The role of pre-sleep worry and intrusions in the maintenance of insomnia. *Journal of Cognitive Psychotherapy*, 16, 161–177.
- Harvey, A. G. (2003). Beliefs about the utility of presleep worry: An investigation of individuals with insomnia and good sleepers. *Cognitive Therapy and Research*, 27, 403–414.
- Harvey, A. G., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive behavioural processes across psychological disorders*. Oxford, UK: Oxford University Press.
- Hayes, S. C., Wilson, K. G., Gifford, E. V., & Follette, V. M. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64, 1152–1168.
- Johnson, S. L., McKenzie, G., & McMurrich, S. (in press). Ruminative responses to negative and positive affect among students diagnosed with bipolar disorder and major depressive disorder. *Cognitive Therapy and Research*.
- Joormann, J., Dkane, M., & Gotlib, I. H. (2006). Adaptive and maladaptive components of rumination? Diagnostic specificity and relation to depressive biases. *Behavior Therapy*, 37, 269–280.
- Just, N., & Alloy, L. B. (1997). The response styles theory of depression tests and an extension of the theory. *Journal of Abnormal Psychology*, 106, 221–229.
- Kashdan, T. B., & Roberts, J. E. (2007). Social anxiety, depressive symptoms, and post-event rumination: Affective consequences and social contextual influences. *Journal of Anxiety Disorders*, 21, 284–301.
- Kuehner, C., & Weber, I. (1999). Responses to depression in unipolar depressed patients: An investigation of Nolen-Hoeksema's response styles theory. *Psychological Medicine*, 29, 1323–1333.
- Langlois, F., Freeston, M. H., & Ladouceur, R. (2000a). Differences and similarities between obsessive intrusive thoughts and worry in a non-clinical population: Study 1. *Behaviour Research and Therapy*, 38, 157–173.
- Langlois, F., Freeston, M. H., & Ladouceur, R. (2000b). Differences and similarities between obsessive intrusive thoughts and worry in a non-clinical population: Study 2. *Behaviour Research and Therapy*, 38, 175–189.
- Lyubomirsky, S., & Tkach, C. (2004). The consequences of dysphoric rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory and treatment* (pp. 21–41). Chichester, UK: Wiley.
- Mansell, W. (2005). Control theory and psychopathology: An integrative approach. *Psychology and Psychotherapy: Theory, Research and Practice*, 78, 141–178.
- Martin, L. L., & Tesser, A. (1989). Towards a motivational and structural theory of ruminative thought. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 306–326). New York: Guilford.
- Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer (Ed.), *Ruminative thoughts* (pp. 1–47). Mahwah, NJ: Erlbaum.
- McLaughlin, K. A., Borkovec, T. D., & Sibrava, N. J. (2007). The effects of worry and rumination on affect states and cognitive activity. *Behavior Therapy*, 38, 23–38.
- Michael, T., Halligan, S. L., Clark, D. M., & Ehlers, A. (2007). Rumination in posttraumatic stress disorder. *Depression and Anxiety*, 24, 307–317.
- Morrison, A. P., & Wells, A. (2007). Relationships between worry, psychotic experiences and emotional distress in patients with schizophrenia spectrum diagnoses and comparisons with anxious and non-patient groups. *Behaviour Research and Therapy*, 45, 1593–1600.
- Murray, J., Ehlers, A., & Mayou, R. A. (2002). Dissociation and posttraumatic stress disorder: Two prospective studies of motor vehicle accident survivors. *British Journal of Psychiatry*, 180, 363–368.
- Nelson, J., & Harvey, A. G. (2002). The differential functions of imagery and verbal thought in insomnia. *Journal of Abnormal Psychology*, 111, 665–669.
- Nelson, J., & Harvey, A. G. (2003). An exploration of pre-sleep cognitive activity in insomnia: imagery and verbal thought. *British Journal of Clinical Psychology*, 42, 271–288.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, 109, 504–511.
- Nolen-Hoeksema, S. (2004). The response styles theory. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory and*

- treatment (pp. 107–123). Chichester, UK: Wiley.
- Nolen-Hoeksema, S., & Harrell, Z. A. (2002). Rumination, depression, and alcohol use: Tests of gender differences. *Journal of Cognitive Psychotherapy, 16*, 391–403.
- Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology, 67*, 92–104.
- Nolen-Hoeksema, S., Stice, E., Wade, E., & Bohon, C. (2007). Reciprocal relations between rumination and bulimic, substance abuse, and depressive symptoms in female adolescents. *Journal of Abnormal Psychology, 116*, 198–207.
- Papageorgiou, C., & Wells, A. (1999). Process and meta-cognitive dimensions of depressive and anxious thoughts and relationships with emotional intensity. *Clinical Psychology and Psychotherapy, 6*, 156–162.
- Papageorgiou, C., & Wells, A. (2003). An empirical test of a clinical metacognitive model of rumination and depression. *Cognitive Therapy and Research, 27*, 261–273.
- Powers, W. T. (1973). *Behavior: The control of perception*. New Caanan: Benchmark Publications.
- Sassaroli, S., Bertelli, S., Decoppi, M., Crosina, M., Milos, G., & Ruggiero, G. M. (2005). Worry and eating disorders: A psychopathological association. *Eating Behaviors, 6*, 301–307.
- Scott, V. B. J., & McIntosh, W. D. (1999). The development of a trait measure of ruminative thought. *Personality and Individual Differences, 26*, 1045–1056.
- Segerstrom, S. C., Stanton, A. L., Alden, L. E., & Shortridge, B. E. (2003). A multidimensional structure for repetitive thought: What's on your mind, and how, and how much? *Journal of Personality and Social Psychology, 85*, 909–921.
- Segerstrom, S. C., Tsao, J. C. I., Alden, L. E., & Craske, M. G. (2000). Worry and rumination: Repetitive thought as a concomitant and predictor of negative mood. *Cognitive Therapy and Research, 24*, 671–688.
- Siddique, H. I., LaSalle-Ricci, V., Glass, C. R., Arnkoff, D. B., & Diaz, R. J. (2006). Worry, optimism, and expectations as predictors of anxiety and performance in the first year of law school. *Cognitive Therapy and Research, 30*, 667–676.
- Siegle, G. J., Moore, P. M., & Thase, M. E. (2004). Rumination: One construct, many features in healthy individuals, depressed individuals, and individuals with lupus. *Cognitive Therapy and Research, 28*, 645–668.
- Smith, J. M., Grandin, L. D., Alloy, L. B., & Abramson, L. Y. (2006). Cognitive vulnerability to depression and axis II personality dysfunction. *Cognitive Therapy and Research, 30*, 609–621.
- Spasojevic, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion, 1*, 25–37.
- Speckens, A. E. M., Ehlers, A., Hackmann, A., Ruths, F. A., & Clark, D. M. (2007). Intrusive memories and rumination in patients with post-traumatic stress disorder: A phenomenological comparison. *Memory, 15*, 249–257.
- Startup, H., Freeman, D., & Garety, P. A. (2007). Persecutory delusions and catastrophic worry in psychosis: Developing the understanding of delusion distress and persistence. *Behaviour Research and Therapy, 45*, 523–537.
- Stöber, J. (1998). Worry, problem elaboration and suppression of imagery: The role of concreteness. *Behaviour Research and Therapy, 36*, 751–756.
- Stöber, J., & Borkovec, T. D. (2002). Reduced concreteness of worry in generalized anxiety disorder: Findings from a therapy study. *Cognitive Therapy and Research, 26*, 89–96.
- Stöber, J., Tepperwien, S., & Staak, M. (2002). Worrying leads to reduced concreteness of problem elaborations: Evidence for the avoidance theory of worry. *Anxiety, Stress, and Coping, 13*, 217–227.
- Sullivan, M. J. L., Bishop, S. R., & Pivik, J. (1995). The Pain Catastrophizing Scale: Development and validation. *Psychological Assessment, 7*, 524–532.
- Thomas, J., & Bentall, R. P. (2002). Hypomanic traits and response styles to depression. *British Journal of Clinical Psychology, 41*, 309–313.
- Thomas, J., Knowles, R., Tai, S., & Bentall, R. P. (2007). Response styles to depressed mood in bipolar affective disorder. *Journal of Affective Disorders, 100*, 249–252.
- Thomsen, D. K. (2006). The association between rumination and negative affect: A review. *Cognition and Emotion, 20*, 1216–1235.
- Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology, 76*, 284–304.
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research, 27*, 247–259.

- Van Rijsoort, S., Emmelkamp, P., & Vervaeke, G. (2001). Assessment of worry and OCD: How are they related? *Personality and Individual Differences, 31*, 247–258.
- Verplanken, B. (2006). Beyond frequency: Habit as mental construct. *British Journal of Social Psychology, 45*, 639–656.
- Wahl, K. (2007). *Differences and similarities between obsessive thoughts and ruminative thoughts in obsessive compulsive and depressed patients*. Paper presented at the V World Congress of Behavioral and Cognitive Therapies, Barcelona, 11 – 14 July 2007.
- Watkins, E. (2004a). Adaptive and maladaptive ruminative self-focus during emotional processing. *Behaviour Research and Therapy, 42*, 1037–1052.
- Watkins, E. (2004b). Appraisals and strategies associated with rumination and worry. *Personality and Individual Differences, 37*, 679–694.
- Watkins, E. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin, 143*, 163–206.
- Watkins, E., & Baracaia, S. (2001). Why do people ruminate in dysphoric moods? *Behaviour Research and Therapy, 30*, 723–734
- Watkins, E., & Moulds, M. (2005a). Distinct modes of ruminative self-focus: Impact of abstract versus concrete rumination on problem solving in depression. *Emotion, 5*, 319–328.
- Watkins, E., & Moulds, M. (2005b). Positive beliefs about rumination in depression – a replication and extension. *Personality and Individual Differences, 39*, 73–82.
- Watkins, E., & Moulds, M. L. (2007). Reduced concreteness of rumination in depression: A pilot study. *Personality and Individual Differences, 43*, 1386–1395.
- Watkins, E., Moulds, M., & Mackintosh, B. (2005). Comparisons between rumination and worry in a non-clinical population. *Behaviour Research and Therapy, 43*, 1577–1585.
- Watkins, E., Scott, J., Wingrove, J., Rimes, K., Bathurst, N., Steiner, H., et al. (2007). Rumination-focused cognitive behaviour therapy for residual depression: A case series. *Behaviour Research and Therapy, 45*, 2144–2154.
- Watkins, E., & Teasdale, J. D. (2001). Rumination and overgeneral memory in depression: effects of self-focus and analytic thinking. *Journal of Abnormal Psychology, 110*, 353–357.
- Watkins, E., & Teasdale, J. D. (2004). Adaptive and maladaptive self-focus in depression. *Journal of Affective Disorders, 82*, 1–8.
- Wells, A. (1995). Meta-cognition and worry: A cognitive model of generalized anxiety disorder. *Behavioural and Cognitive Psychotherapy, 23*, 301–320.
- Wells, A., & Carter, K. (1999). Preliminary tests of a cognitive model of generalized anxiety disorder. *Behaviour Research and Therapy, 37*, 585–594.
- Wells, A., & Carter, K. (2001). Further tests of a cognitive model of generalized anxiety disorder: Metacognitions and worry in GAD, panic disorder, social phobia, depression, and nonpatients. *Behavior Therapy, 32*, 85–102.
- Wells, A., & Morrison, A. P. (1994). Qualitative dimensions of normal worry and normal obsessions: a comparative study. *Behaviour Research and Therapy, 32*, 867–870.
- Wells, A., & Papageorgiou, C. (1995). Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy, 33*, 579–583.