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Cognitive-Behavioral Processes Distinguishing Normal From Pathological Experiences Across Anxiety and Mood Disorders

Abstract

Several cognitive, behavioral, and emotional experiences are found across healthy and clinical populations and across distinct diagnostic categories. The present research was aimed at identifying processes (e.g., functional impairment, perfectionism, unwanted thought) that may operate across disorders to differentiate normal from abnormal experiences or increase risk for anxiety or mood symptoms. In Study 1, individuals diagnosed with generalized anxiety disorder (GAD), non-GAD high worriers, and normal worriers completed measures of perceived functioning and performance standards. Widespread functional impairments were reported both by individuals with GAD and by non-GAD high worriers. However, only non-GAD high worriers showed elevated performance standards, suggesting that different processes may account for the functional impairments perceived by these groups (i.e., recognition of diminished personal functioning versus inflated standards). Study 2 tested the association of appraisals of worried, ruminative, and obsessional thoughts to outcomes assessed concurrently and at 1-month follow-up. Across thought types, negative and positive appraisals were cross-sectionally associated with greater negative outcomes; positive appraisals were further associated with greater positive outcomes. Negative and positive appraisals of worry and rumination were also associated with increased negative outcomes at follow-up. These results suggest several similarities across thought types in the relationship between appraisals and outcomes, providing support for further transdiagnostic study of these processes. In Study 3, healthy participants were randomly assigned to receive negative, normalizing, or no feedback about their worried, ruminative, and obsessional thoughts to test the hypothesis that negative appraisals would lead to negative outcomes across thought types. Individuals' preexisting beliefs about thoughts were also expected to predict outcomes, both alone and in interaction with experimental condition. Unexpectedly, individuals in the Negative Feedback condition reported less negative outcomes than those in the other conditions, but these results were qualified by an interaction between preexisting beliefs and experimental condition across all thought types. These results suggest that preexisting negative beliefs about different forms of unwanted thought function as a cognitive vulnerability in interaction with specific stressors. Collectively, these studies suggest several features that may operate transdiagnostically to increase risk for symptom development or to differentiate normal from abnormal experiences of anxiety and depression.

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COGNITIVE-BEHAVIORAL PROCESSES DISTINGUISHING NORMAL FROM
PATHOLOGICAL EXPERIENCES ACROSS ANXIETY AND MOOD DISORDERS

Emily Gentes

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ABSTRACTCOGNITIVE-BEHAVIORAL PROCESSES DISTINGUISHING NORMAL FROM
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Emily Gentes

Ayelet Meron Ruscio

Several cognitive, behavioral, and emotional experiences are found across healthy and clinical populations and across distinct diagnostic categories. The present research was aimed at identifying processes (e.g., functional impairment, perfectionism, unwanted thought) that may operate across disorders to differentiate normal from abnormal experiences or increase risk for anxiety or mood symptoms. In Study 1, individuals diagnosed with generalized anxiety disorder (GAD), non-GAD high worriers, and normal worriers completed measures of perceived functioning and performance standards. Widespread functional impairments were reported both by individuals with GAD and by non-GAD high worriers. However, only non-GAD high worriers showed elevated performance standards, suggesting that different processes may account for the functional impairments perceived by these groups (i.e., recognition of diminished personal functioning versus inflated standards). Study 2 tested the association of appraisals of worried, ruminative, and obsessional thoughts to outcomes assessed concurrently and at 1-month follow-up. Across thought types, negative and positive appraisals were cross-sectionally associated with greater negative outcomes; positive appraisals were further associated with greater positive outcomes. Negative and positive appraisals of worry and rumination were also associated with increased negative outcomes at follow-up. These results suggest several similarities across thought types in the relationship between

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Unexpectedly, individuals in the Negative Feedback condition reported less negative outcomes than those in the other conditions, but these results were qualified by an interaction between preexisting beliefs and experimental condition across all thought types. These results suggest that preexisting negative beliefs about different forms of unwanted thought function as a cognitive vulnerability in interaction with specific stressors. Collectively, these studies suggest several features that may operate transdiagnostically to increase risk for symptom development or to differentiate normal from abnormal experiences of anxiety and depression.

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Chapter 1:
Perceptions of Functioning in Worry and Generalized Anxiety Disorder

Abstract

Recent research has suggested that individuals with generalized anxiety disorder (GAD) may underestimate the quality of their cognitive and interpersonal functioning, raising the question of whether perceived functional impairments are widespread across life domains and distinguish GAD from other forms of severe worry. The present study aimed to address these questions by examining perceived functional impairments in GAD worriers, non-GAD high worriers, and normal worriers. Elevated performance standards were examined as an explanation for perceived functional impairments. Participants completed measures of perceived functioning and performance standards. Both GAD and non-GAD high worriers reported widespread impairments. However, only non-GAD high worriers showed elevated performance standards. Results suggest that while GAD and non-GAD worriers perceive themselves to be impaired across important life domains, impairment reported by non-GAD high worriers may at least partly reflect elevated performance standards. These findings argue for tailoring treatments for GAD and non-GAD severe worry to the specific dysfunction of each group.

Perceptions of Functioning in Worry and Generalized Anxiety Disorder

Generalized anxiety disorder (GAD) is a psychological condition characterized by excessive and uncontrollable worry about a number of life events or activities. Worry in GAD is accompanied by symptoms of restlessness, fatigue, difficulty concentrating, irritability, muscle tension, and sleep disturbance. By definition, individuals diagnosed with GAD report significant distress or impairment related to their symptoms (American Psychiatric Association, 1994). Studies have found GAD to be associated with significant psychosocial and functional impairment (Wittchen, Zhao, Kessler, & Eaton, 1994) and with increased health care utilization (Greenberg et al., 1999). Importantly, individuals with GAD report poorer overall quality of life compared not only to nonanxious individuals (Henning, Turk, Mennin, Fresco & Heimberg, 2007) but to individuals with other anxiety and mood disorders (Hoffman, Dukes, & Wittchen, 2008), suggesting that this disorder may be particularly debilitating. In fact, GAD has been found to be associated with more occupational disability (in terms of days out of role) than any other single mental disorder (Kessler & Wittchen, 2002).

Despite numerous studies linking GAD with significant personal disability and societal cost, recent findings have begun to question whether some of the impairments reported by those with GAD may be due, at least in part, to these individuals' misperceptions of the quality of their functioning. For example, GAD worriers report low confidence in their cognitive abilities, including attention, memory, and cognitive flexibility (Ruscio & Borkovec, 2004). By contrast, neuropsychological research has shown their performance on objective tests of cognitive functioning to fall within normal limits and to be comparable to the performance of nonanxious controls (Aikins & Craske,

2001). GAD worriers also rate themselves as having more interpersonal problems and being less interpersonally effective than do normal worriers (Borkovec, Newman, Pincus, & Lytle, 2002; Przeworski et al., 2011). However, in one study in which collateral ratings were obtained from friends, GAD worriers and normal worriers received similar ratings of interpersonal functioning (Eng & Heimberg, 2006). Taken together, these studies raise the possibility that individuals with GAD may perceive deficiencies that are neither apparent to others nor reflected in objective measures.

Several important gaps in knowledge presently limit understanding of functional impairment in GAD. First, previous studies of GAD have either assessed functioning globally or examined functioning in a small subset of life domains. There is a need to determine whether self-reported deficits in functioning extend to important life domains not studied previously (e.g., educational achievement, family relationships). Second, understanding the reasons for these perceived impairments will be important for efforts to design appropriate interventions targeted at improving the quality of life of individuals who suffer from GAD. Perfectionism is strongly associated with worry and GAD and may lead affected individuals to hold themselves to extremely high standards (Kawamura, Hunt, Frost, & DiBartolo, 2001; Stöber & Joormann, 2001). Elevated standards for what constitutes adequate functioning may in turn lead worriers to evaluate themselves more poorly than individuals with lower standards, even if actual functioning is the same. This possibility has not been tested directly by previous studies, whose methods have been limited to self-report assessment of perfectionism and functioning. Because GAD worriers may have genuinely worse life situations than normal worriers, such methods cannot ascertain whether negative appraisals of functioning reflect poor

quality of life or misappraisals (due to elevated performance standards) of what others might consider good functioning. If the latter, treatment may need to focus on modifying elevated standards rather than on changing functioning.

Finally, the tendency of prior studies to compare GAD worriers with normal worriers has made it difficult to disentangle whether self-reported impairment covaries with GAD status or with worry severity more generally. Recent research has revealed that many individuals who report high levels of worry do not qualify for a diagnosis of GAD (Kessler et al., 2005; Ruscio, 2002). A rigorous test of perceived impairments that are unique to GAD, and so may help define the disorder and set it apart from normative experiences of anxiety, requires a demonstration that these features are found in GAD but not in similarly worried individuals without the disorder. By contrast, if perceived impairments previously attributed to GAD are also found among non-GAD high worriers, it may suggest that efforts to reduce the disability associated with anxiety, and perhaps prevent the onset of full-blown GAD, may need to include even nondiagnosed severe worriers.

Of the few studies that have compared GAD and non-GAD high worriers, we are aware of only one that has compared these groups on a functional domain not directly related to symptoms of the disorder (Ruscio & Seitchik, 2007). In this study, GAD and non-GAD high worriers performed comparably to one another, and to normal worriers, on an interpersonal problem-solving task. Nonetheless, both groups of high worriers were less satisfied with their problem-solving performance than were the normal worriers. Both groups of high worriers also reported more negative self-appraisals than normal worriers on global self-report questionnaires assessing problem-solving skill,

satisfaction with problem-solving skill, and problem-solving confidence. These results are consistent with prior findings of subjective rather than objective impairment in GAD (Aikins & Craske, 2001; Eng & Heimberg, 2006) and raise the possibility that severe worriers, irrespective of GAD status, may underestimate their functioning in ways that serve to perpetuate worry.

The current study had two objectives aimed at addressing existing gaps in this literature. The first objective was to test whether GAD worriers, non-GAD high worriers, and normal worriers differ in their perceived functioning, and to explore whether this effect is evident across life domains or confined to specific areas of functioning. GAD worriers were expected to rate their functioning across important life domains more poorly than non-GAD high worriers, who in turn were expected to rate themselves more poorly than normal worriers. The second objective was to test the extent to which differences in perceived functioning may reflect differing personal standards for what qualifies as adequate functioning. GAD worriers were expected to hold elevated personal standards relative to non-GAD high worriers, who in turn were expected to hold elevated standards relative to normal worriers.

Method

Design

Participants were selected for inclusion in the three study groups (GAD worry, non-GAD high worry, and normal worry) on the basis of the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger & Borkovec, 1990) and the Anxiety Disorders Interview Schedule (ADIS; DiNardo, Brown, & Barlow, 1996). Participants in the GAD group ($N = 25$) were diagnosed with *DSM-IV* GAD using the ADIS.

Participants in the non-GAD high worry group ($N = 46$) did not qualify for a GAD diagnosis on the ADIS, but scored within one standard deviation of the published PSWQ mean for GAD patients ($PSWQ \geq 56$; Molina & Borkovec, 1994). Importantly, the PSWQ scores of the GAD ($M = 68.04$, $SD = 7.91$) and non-GAD high worry ($M = 66.35$, $SD = 5.86$) groups were quite similar in the current sample, $t(67) = 1.01$, $p = .318$, $d = 0.24$, suggesting that any differences in perceived functioning between these groups could not be attributed to differences in worry severity. Participants in the normal worry group ($N = 37$) did not qualify for a GAD diagnosis and scored within one standard deviation of the PSWQ mean for healthy college students ($PSWQ \leq 50$; Molina & Borkovec, 1994).

Participants

The sample consisted of undergraduate students at a private northeastern university. Participants were primarily female (66%; $N = 71$) with a mean age of 19 ($SD = 1.12$). Sex composition did not differ significantly across groups, $\chi^2(2, N = 107) = 5.08$, $p = .080$. The sample was 64% Caucasian, 18% Asian/Pacific Islander, 7% Hispanic, 5% Black, and 6% other race-ethnicity.

A power analysis was conducted using effect sizes from prior research comparing GAD and non-GAD high worriers on self-reported impairment and quality of life. Effect sizes were in the moderate to large range ($d = 0.31 - 1.90$; Gentes & Ruscio, 2009). The mean of these effect sizes ($d = 1.10$) was submitted to the power analysis, which indicated that a power level of 0.80 (with alpha = .05) would be achieved with 23 participants per group.

Measures

Grouping measures. The Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990), which measures trait worry, was completed online as part of a larger screening that included self-report measures of personality and psychopathology.

Participants were administered the GAD module of the Anxiety Disorders Interview Schedule (ADIS; DiNardo et al., 1996), a semi-structured clinical interview assessing the *DSM-IV* symptoms of GAD. The ADIS was administered in-person by either the first author or one of two trained research assistants. All assessments were audiotaped and reviewed by the first author. Based on review of all 108 tapes, the three assessors achieved perfect agreement ($\kappa = 1.00$) for GAD diagnostic status.

Measure of perceived functioning. Participants completed a Self-Ratings Questionnaire which was adapted for this study from the Quality of Life Enjoyment and Satisfaction Questionnaire (QLESQ), a reliable and valid measure of enjoyment and satisfaction across various areas of daily functioning (Endicott, Nee, Harrison, & Blumenthal, 1993). The Self-Ratings Questionnaire included the same 12 life domains as the QLESQ (schoolwork, social relationships, family relationships, overall well-being, physical health, mood, leisure activities, sexual functioning, household activities, living/housing situation, economic status, ability to function in daily life). However, rather than rating their enjoyment and satisfaction in each domain as in the original measure, participants were asked to rate how well they had been doing in each domain over the past month. Participants rated their functioning in each domain using the original rating scale of 0 (*very poor*) to 8 (*very good*).

Experimental Task

Participants were presented with a short passage describing the life of a fictional student (see Appendix), then were asked to rate this student using the same domains and rating scale that they had used on the Self-Ratings Questionnaire. This experimental task was designed to serve as a standardized rubric to calibrate participants' ratings across a common set of life circumstances. It was based on the methodology of anchoring vignettes (King, Murray, Salomon, & Tandon, 2004) which was developed to address problems that occur when different groups of respondents (e.g., from different countries or socioeconomic groups) use response categories differently or hold different standards for endorsement of response categories. Anchoring vignettes have been found to be an effective tool for correcting for such differences in previous research on health (King et al., 2004), work disability (Kapteyn, Smith, & Van Soest, 2007), job satisfaction (Kristensen & Johansen, 2006), and life satisfaction (Christensen, Herskind, & Vaupel, 2006). The passage written for the present study was modeled after anchoring vignettes from previous research on clean drinking water and health (King et al., 2004; Salomon, Tandon, & Murray, 2008). The passage included both positive and negative details about a fictional student's life across each of the 12 domains included in the present study. Participants were asked to read the passage and make ratings as if the passage were describing their own life. By holding actual functioning constant, this task enabled us to test for group differences in appraisals after eliminating the potential confound of objective differences in functioning.

Procedure

All procedures were in compliance with ethical and institutional guidelines and were approved by the University of Pennsylvania Institutional Review Board. Students

were recruited through the Psychology Department's Research Participation Web site, where they clicked on a link to complete a consent form and online screening questionnaires. Participants whose PSWQ scores met the inclusion criteria for one of the study groups were invited to the lab to complete the hour-long study protocol. Students received research credits towards their psychology course in exchange for participation.

Participants provided informed consent and were administered the ADIS by an experimenter. They then independently completed a demographics questionnaire, followed by the Self-Ratings Questionnaire and Passage Ratings Questionnaire. All participants were debriefed before leaving the lab.

Results

Statistical Approach

Because the study included a large number of outcome variables (12 life domains) and possible group comparisons (GAD, non-GAD high worry, normal worry), two steps were taken to limit the number of statistical tests performed. First, four life domains (schoolwork, social relationships, family relationships, and overall well-being) were identified *a priori* as primary given their particular relevance for college students. The remaining eight life domains (physical health, mood, leisure activities, sexual functioning, household activities, living/housing situation, economic status, and ability to function in daily life) were considered secondary. Results for secondary domains were viewed as exploratory and interpreted with a focus on the overall pattern of group differences. Second, to conserve power for the comparisons of greatest interest, planned contrasts were used in place of omnibus tests. Planned contrasts are focused significance tests using the *t*-statistic which conserve statistical power when specific patterns of results

are predicted (Rosenthal & Rosnow, 1985). Given our particular interest in identifying features unique to GAD relative to other forms of high worry, and to non-GAD high worry relative to more normative levels of worry, planned contrasts focused on these specific group comparisons.

Ratings of Participants' Functioning

Outcomes uniquely associated with GAD. Table 1 presents results for the four primary and eight secondary domains of functioning. Planned contrasts revealed lower perceived functioning among GAD than non-GAD high worriers in the domains of schoolwork, social relationships, and overall well-being, all $t(105) > 2.70$, all $p < .010$. In contrast, there were no significant differences between the two groups in the domain of family relationships, $t(105) = 1.53$, $p = .133$.

Self-ratings on secondary life domains also indicated lower perceived functioning among GAD high worriers than non-GAD high worriers. GAD worriers rated themselves significantly more poorly on two of the eight secondary domains (physical health and sexual functioning), both $t(105) > 2.05$, both $p < .043$.

Outcomes associated with non-GAD severe worry. Non-GAD high worriers perceived a number of significant deficits in their functioning relative to normal worriers, rating their social relationships and overall well-being more negatively than did normal worriers, both $t(105) > 2.43$, both $p < .018$. There were no differences between the two groups in self-ratings of schoolwork or family relationships, both $t(105) < 1.46$, both $p > .249$. For the secondary domains, non-GAD worriers rated themselves more poorly than normal worriers on four of eight secondary domains (physical health, mood, leisure activities, ability to function in daily life), all $t(105) > 2.33$, all $p < .023$.

Ratings of a Standardized Passage

Outcomes uniquely associated with GAD. To determine whether the previously observed group differences in self-rated functioning might be due to different personal standards for what constitutes good functioning, we compared the groups on their ratings of a standardized passage describing the life of a fictional student (see Table 2). In a reversal of the pattern seen in self ratings, the GAD group tended to rate the functioning of the fictional student more highly than did the non-GAD high worry group. These differences were small and reached statistical significance only in the domain of schoolwork, $t(105) = 2.03, p = .045$. The pattern was largely repeated for the secondary domains, where a trend toward significance was found for leisure activities, $t(105) = 1.75, p = .083$.

Outcomes associated with non-GAD severe worry. Non-GAD high worriers rated the functioning of the fictional student more poorly compared to normal worriers. Planned contrasts revealed significantly lower ratings in the domains of social relationships and overall well-being, both $t(105) > 2.34, p < .021$. There were additional trends towards significance in the domains of schoolwork and family relationships, both $t(105) > 1.75$, both $p < .083$. Non-GAD high worriers also rated the student in the passage more poorly than did normal worriers in four of the seven secondary domains (leisure activities, household activities, living/housing situation, ability to function in daily life), all $t(105) > 2.33$, all $p < .022$.

Discussion

The present findings should be interpreted in the context of several limitations of the study. First, although participants met full *DSM-IV* criteria for GAD diagnosed by

clinical interview, the use of a college student sample represents a limitation in that participants were relatively high functioning and consequently may not be representative of the broader population of individuals with GAD. In addition, certain life domains, such as economic status or household activities, may be less relevant to college students than to adults living independently in the community and so may be less likely to reflect impairment in this sample. Second, although the systematic assessment of functioning across a wide range of important life domains may be viewed as a strength of the study, the large number of resulting statistical tests increased the risk of Type I error.

Consistent findings across domains increase confidence that we are converging on real differences in functioning across these groups. However, further confidence will require replicating positive findings in new samples, including community and clinical samples with GAD. Finally, the inability to corroborate participants' reports of impairment using objective measures of functioning is an additional limitation of the current study. Given the biases inherent in self-reports of functional impairment, corroboration is critical; however, many important life domains are difficult (e.g., leisure time activities) or perhaps even impossible (e.g., mood, overall well-being) to assess via objective measures. Future research will need to give careful consideration to how best to assess impairment and how complementary measures might be combined to provide a reasonable objective assessment of functioning. Useful measures might include external measures relevant to the population under study (e.g., measures of work performance for community participants), objective tests or performance tasks (e.g., the Means Ends Problem-Solving Task; Platt & Spivack, 1975; cf. Ruscio & Seitchik, 2007), and collateral ratings from others such as family, friends, coworkers, classmates, or

supervisors.

Bearing these limitations in mind, results from the present study show that both GAD and non-GAD high worriers perceive themselves to be impaired across important domains of functioning. Individuals with GAD were expected to report widespread functional impairment based on past research showing self-reported deficits in the few specific life domains that have been studied in this group (e.g., Eng & Heimberg, 2006; Henning et al., 2007; Hoffman et al., 2008; Wittchen et al., 1994). Much less research has examined perceived impairment among non-GAD high worriers, although one recent study found that non-GAD high worriers – along with GAD worriers – reported impairment in the area of interpersonal problem solving (Ruscio & Seitchik, 2007). Results from the present study show that non-GAD high worriers, like GAD worriers, perceive themselves to be impaired across many important domains of functioning. However, results from the anchoring vignettes showed important differences between the GAD and non-GAD high worry groups. Obtaining participants' ratings of a standardized passage enabled us to compare their reactions to a common set of life circumstances and consequently to detect differing personal standards for what qualifies as adequate functioning. We found that non-GAD high worriers perceived the level of functioning described in the passage significantly more poorly than did GAD worriers (in the domain of schoolwork) and normal worriers (in the domains of social functioning and overall well-being), consistent with the possibility that non-GAD high worriers hold elevated standards for functioning.

Taken together, these lines of evidence hint that different processes account for the functional impairments perceived by GAD and non-GAD high worriers. For GAD

worriers, recognition of their own diminished personal functioning may lead them to view others as functioning better. For non-GAD worriers, inflated standards may lead to overestimation of true impairments or negative perceptions of functioning even in the absence of true impairments. Both high worry groups contrast sharply with normal worriers' ratings of themselves and others (as seen in ratings of the fictional student in the passage). Our results suggest either that perfectionism is more the province of non-GAD than GAD high worriers, or that elevated standards among GAD worriers are counteracted somewhat by the accurate recognition that they are functioning more poorly than many of those around them. While the pattern of findings across the self-ratings and passage ratings are suggestive of genuine impairments in the GAD group but overestimated impairments in the non-GAD high worry group, further research using objective indicators of functioning is needed to establish the extent of objective impairment in these domains.

Results from the present study raise pointed questions about the relative importance of perceived versus genuine functioning. Research on stress (Lazarus & Folkman, 1986) and social support (Barrera, 1986), among other constructs, has shown perceived experience to be an important predictor of outcomes even when considered apart from objective indicators of experience (Cohen, Tyrrell, & Smith, 1993). The impairment perceived by both high worry groups in the present study – even if not based in objective impairment – may similarly be important in its own right, even contributing to the maintenance of worry and GAD. For instance, individuals who perceive themselves to have low ability and limited capacities may be more worried about their ability to deal successfully with possible future negative events and threats in the

environment. They may engage in increased worry in an attempt to anticipate and solve problems, avoid uncertainty about the future, or even superstitiously to prevent future negative events, thereby perpetuating the cycle of worry (Borkovec, Davey & Tallis, 1994; Borkovec & Roemer, 1997). Nevertheless, the different pattern of findings among GAD and non-GAD high worriers suggests that treatment may need to be tailored to different problems in the two groups. GAD worriers may be most likely to benefit from skills training in areas where they demonstrate genuine impairment. As treatment outcome studies rarely include systematic assessments of functioning in domains beyond clinical symptoms, it is unclear whether functional deficits remediate with successful treatment of GAD symptoms or whether these deficits remain after symptom change and require additional intervention (e.g., Borkovec et al., 2002). Recent therapeutic developments have been spurred by the idea that conventional treatments may be insufficient to address certain functional deficits that are believed to contribute to the maintenance of GAD (e.g., impairment in interpersonal functioning) and hence to the relatively low success rates of treatments that solely target symptoms of the disorder. A promising integrative psychotherapy which combines traditional cognitive behavior therapy with techniques to address interpersonal problems has been found to produce improvement in interpersonal problems as well as GAD symptoms (Newman, Castonguay, Borkovec, Fisher, & Nordberg, 2008). Results from the present study suggest that individuals with GAD may benefit from skills training in areas where they accurately perceive themselves to be impaired. Evaluating the benefits of such training may require a broader assessment of functioning than most studies presently include, with therapeutic improvement measured by increases on “positive” indices (e.g., quality

of and satisfaction with functioning) as well as reductions on negative indices (e.g., anxiety symptoms; Mendlowicz & Stein, 2000; Papakostas, Peterson, Mahal, Mischoulon, Nierenberg, & Fava, 2004; Rapaport, Clary, Fayvad, & Endicott, 2005). It may also be important to assess whether individuals accurately perceive improvements in functioning resulting from successful treatment of GAD symptoms and associated deficits, to determine whether further intervention targeting self-appraisals is warranted.

In contrast, non-GAD high worriers may benefit more from treatment targeting elevated performance standards than from interventions for specific functional deficits. Several existing cognitive-behavioral treatment packages for GAD already include features intended to address elevated standards. In one treatment (Borkovec & Sharpless, 2004), clients are encouraged to let go of preexisting beliefs, predictions, and expectations in order to live in the present moment. Clients learn that they can trust themselves by using a diary of worries and outcomes as evidence that, in most cases, they cope quite well with whatever happens. A different treatment (Dugas et al., 2003; Ladouceur, Dugas, Freeston, Leger, Gagnon, & Thibodeau, 2000) focuses instead on problem orientation, helping clients learn that problems are a normal part of daily life rather than a reflection on the client's skills, abilities, or worth as a person and that it is normal for problems to be complex and require time and effort to solve. As interventions targeting elevated standards have been studied only as part of larger treatment packages administered to individuals with GAD, it would be valuable to test whether these techniques alone are effective in modifying elevated standards, and whether their efficacy extends to high worriers without GAD. These techniques might also be expanded to more fully address heightened performance expectations evidenced by non-GAD high

worriers. For example, a procedure similar to the passage ratings employed here could be used to demonstrate to non-GAD high worriers that their performance is comparable to others' while their expectations are significantly higher, providing a starting point for challenging and replacing negative self-appraisals.

The present study is notable for identifying widespread perceived impairment as common in both GAD and non-GAD high worriers, with elevated performance standards distinguishing between the two groups. The ability to distinguish GAD worriers from individuals who report high levels of worry but do not meet criteria for the diagnosis may have important implications for conceptualizations of the disorder. At a time when serious consideration is being given to removing disability from the diagnostic criteria for mental disorders (American Psychiatric Association, 2010), information about perceived disability in GAD and in the far larger number of high worriers who do not presently qualify for the disorder could help to inform decisions about how GAD should be defined in future editions of the *DSM*. These findings may also constitute an important step towards preventing and treating the high levels of disability seen in GAD by suggesting the most appropriate avenues of intervention for worriers with this pernicious disorder.

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Table 1

Group Means and Standard Deviations for Functioning by Life Domain

Domain/Rater	GAD (<i>n</i> = 25)	<i>d</i>	Non-GAD High Worry (<i>n</i> = 46)	<i>d</i>	Normal Worry (<i>n</i> = 37)
Primary domains					
Schoolwork	4.20 (1.89)*	0.75	5.50 (1.64)	0.16	5.76 (1.62)
Social relationships	4.72 (1.88)*	0.68	5.96 (1.76)	0.50	6.73 (1.12)*
Family relationships	5.96 (1.57)	0.36	6.61 (1.95)	0.25	7.03 (1.32)
Overall well-being	4.76 (1.45)*	0.74	5.74 (1.25)	0.99	6.88 (1.01)*
Secondary domains					
Physical health	4.96 (1.34)*	0.49	5.70 (1.58)	0.61	6.60 (1.34)*
Mood	4.56 (1.33)	0.41	5.12 (1.39)	0.92	6.35 (1.27)*
Leisure activities	5.64 (1.60)	0.24	6.04 (1.67)	0.48	6.70 (0.85)*
Sexual functioning	4.36 (1.60)*	0.86	5.79 (1.70)	0.36	6.38 (1.53)
Household activities	4.96 (2.15)	0.43	5.78 (1.76)	0.15	6.03 (1.42)
Living/housing situation	5.12 (2.01)	0.27	5.70 (2.06)	0.33	6.30 (1.63)
Economic status	5.40 (2.08)	0.38	6.11(1.77)	0.02	6.08 (1.71)
Ability to function in daily life	5.56 (1.66)	0.45	6.24 (1.40)	1.02	7.41 (0.72)*

Note. Table values reflect means (standard deviations). GAD = generalized anxiety disorder. Means marked with an * differ from the mean for the non-GAD high worry group at $p < .05$. Cohen's *ds* compare each group (GAD or normal worry) to the non-GAD high worry group.

Table 2

Group Means and Standard Deviations for Passage Ratings by Life Domain

Domain	GAD (<i>n</i> = 25)	<i>d</i>	Non-GAD High Worry (<i>n</i> = 46)	<i>d</i>	Normal Worry (<i>n</i> = 37)
Primary domains					
Schoolwork	5.48 (1.50)*	0.50	4.67 (1.73)	0.39	5.30 (1.49)
Social relationships	5.80 (1.12)	0.35	5.37 (1.34)	0.50	6.03 (1.28)*
Family relationships	5.28 (1.24)	0.19	5.02 (1.51)	0.38	5.57 (1.39)
Overall well-being	5.40 (0.87)	0.43	4.96 (1.17)	0.76	5.76 (0.93)*
Secondary domains					
Physical health	4.60 (1.76)	0.01	4.61 (1.64)	0.03	4.65 (1.51)
Mood	5.32 (1.46)	0.20	5.04 (1.32)	0.37	5.49 (1.12)
Leisure activities	5.60 (1.44)	0.43	5.02 (1.25)	0.61	5.81 (1.35)*
Household activities	3.04 (1.65)	0.33	3.63 (1.92)	0.52	4.51 (1.46)*
Living/housing situation	4.72 (1.40)	0.18	4.43 (1.85)	0.69	5.54 (1.30)*
Economic status	5.00 (1.29)	0.28	4.65 (1.23)	0.39	5.11 (1.13)
Ability to function in daily life	5.40 (1.32)	0.07	5.30 (1.35)	0.60	6.08 (1.23)*

Note. Table values reflect means (standard deviations). GAD = generalized anxiety disorder. Means marked with an * differ from the mean for the non-GAD high worry group at $p < .05$. Cohen's *ds* compare each group (GAD or normal worry) to the non-GAD high worry group.

Chapter 1 Appendix

Passage

Imagine that you are in your third year as a student at the [large Northeastern University]. You are living off-campus with two roommates who you are friendly with. You all get along well. There is some tension about household chores. You occasionally have mice in the kitchen because you allow dishes and trash to pile up when none of you feels like taking care of it. Your living situation is generally comfortable. Your neighborhood is noisy most nights and you are a light sleeper. You are awakened by street noise or parties at least a few times each week, but you are able to fall back to sleep within 30 minutes each time and rarely feel tired during the day. You spend two or three nights per week with your boyfriend/girlfriend, when he/she is not out with friends. You both enjoy having sex a few times per week, but about one night per week you don't feel like it and then you just tell him/her that you are not in the mood. You enjoy cooking or watching movies at home either alone or with your roommates and you occasionally tag along with them when they go out on the weekends.

You love and appreciate your family very much and spend at least a couple of days with them each time you have a school break, but you have arguments almost every time you get together with them. Your parents pay your tuition and rent and give you spending money. You know that your parents' jobs aren't going as well as they used to because of the trouble with the economy. Even with your part time job, you find that money is a little tight. By the time you have taken care of all of your necessary expenses you usually have a little money left over to use on something fun.

You are generally a very quick learner and you have maintained a GPA of 3.3. You occasionally become absentminded, losing your keys, forgetting things at home, and having trouble concentrating or learning the rules of simple games that your friends play in bars. Every day after classes you work out for 30 minutes at the gym. You avoid any strenuous activities or sports because you feel very out of shape when you run. You generally enjoy your daily activities. You occasionally feel down for a day or two and lose interest. On these days, you are able to carry on with your day-to-day activities, but everything you do feels like an effort. These feelings usually pass within a few days. You are generally very productive. You have also been getting a terrible headache about once a month that is relieved within 3-4 hours of taking a painkiller. During the headache, you have to lie down and cannot take care of any other tasks.

Chapter 2:

A Transdiagnostic Test of Cognitive-Behavioral and
Metacognitive Models of Unwanted Negative Thought

Abstract

Intrusive or repetitive negative thought is a feature of several anxiety and mood disorders and is also commonly seen in healthy individuals. Cognitive-behavioral and metacognitive theories of generalized anxiety disorder, major depressive disorder, and obsessive compulsive disorder suggest that it is the interpretation (rather than the occurrence) of worried, ruminative, and obsessional thoughts that leads from normal experiences to symptom development. However, research on these theories has tended to focus on general beliefs rather than appraisals of particular thoughts and has been disorder-specific, despite similarities across thought types. The present study tested the association of appraisals of each thought type to outcomes assessed cross-sectionally and at 1-month follow-up. Across all thought types, both negative and positive appraisals were cross-sectionally associated with greater negative outcomes, and positive appraisals were further associated with greater positive outcomes. Time 1 negative and positive appraisals of worry and rumination were associated with increased negative outcomes one month later. Overall, results suggest more similarities than differences in the relationship between appraisals and outcomes across thought types, arguing for transdiagnostic study of these processes.

A Transdiagnostic Test of Cognitive-Behavioral and Metacognitive Models of Unwanted Negative Thought

Several anxiety and mood disorders - including generalized anxiety disorder (GAD), major depressive disorder (MDD), and obsessive-compulsive disorder (OCD) - are characterized by the experience of intrusive or repetitive negative thought. Intrusive and repetitive negative thought is so widespread, in fact, that it has been conceptualized as a transdiagnostic process operating across putatively distinct disorders (Ehring & Watkins, 2008). Although characteristics of thoughts differ across disorders, there are also important similarities between these thoughts, particularly in the role that they are hypothesized to play in disorder development. Worry, which is the central feature of GAD, and rumination, which is common in MDD, are both characterized by a predominance of verbal thought as well as an abstract processing style; they are thought to differ mainly in the temporal orientation of thought content, with worry focused on the future and rumination focused on the past or present (Watkins, Moulds, & Mackintosh, 2005). The obsessions characteristic of OCD have been found to differ from worry and rumination in several important respects, particularly in their tendency to involve imagery rather than verbal thought (Langlois, Freeston, & Ladouceur, 2000a,b; Wells & Morrison, 1994). Despite these differences, all three thought types are unwanted, and all are associated with negative emotions and loss of mental control (Langlois et al., 2000b; Papageorgiou, 2006).

Importantly, each of these thought types is commonly experienced by healthy as well as clinical populations (Langlois et al., 2000b; Papageorgiou, 2006), raising questions about why only some individuals develop anxiety and mood disorders characterized by these

thoughts. Cognitive-behavioral theories of obsessions suggest that the individual's response to these thoughts plays a crucial role in the pathway from normal negative thought to symptom development. According to these theories, the pathway to symptom development begins when normal intrusive thoughts are interpreted catastrophically as personally meaningful or important, or as having potentially serious consequences (Rachman, 1997; Salkovskis, 1985). These catastrophic interpretations are often accompanied by beliefs of personal responsibility to avoid acting on the thought or to stop the thought or its consequences, which leads to attempts to monitor and to control thoughts. Negative interpretations of the intrusive thoughts, as well as the subsequent avoidance attempts, are believed to lead to paradoxical increases in thought frequency and other OCD symptoms. Building on these cognitive-behavioral accounts, more recent metacognitive models have proposed that beliefs about the meaning, power, and control of thoughts and about the use of rituals to control the thoughts (Wells, 1997; 2000; Wells & Matthews, 1994) may be more central to OCD than general beliefs such as the responsibility to prevent harm. Despite their difference in focus, cognitive-behavioral and metacognitive theories agree on the fundamental assertion that it is the interpretation of normal intrusive thoughts that gives rise to OCD symptoms.

Metacognitive theories of worry and rumination similarly emphasize that interpretations of thoughts may play an important role in the escalation from normal to pathological experiences (Papageorgiou & Wells, 2001; Wells, 1995). However, these theories hypothesize that the pathway to disorder development begins with positive beliefs about the usefulness of worry and rumination (for example, in helping to prepare for future events or to learn from past mistakes or failures) which cause individuals to

engage intentionally in these ways of thinking. In time, increased engagement in worry and rumination is hypothesized to lead to negative experiences (e.g., subjective loss of control over thoughts), that give rise to negative beliefs about the uncontrollability and dangerousness of the thoughts, which in turn lead to further concerns about the thoughts themselves (meta-worry), avoidant behavior (e.g., reassurance-seeking, avoidance of triggers for the thoughts, thought control strategies) and ultimately, GAD or MDD symptoms.

Cognitive-behavioral and metacognitive theories have been highly influential to our understanding and treatment of emotional disorders and have received a great deal of empirical support (e.g., Cartwright-Hatton & Wells, 1997; Papageorgiou & Wells, 2003; Steketee et al., 2003; Wells & Carter, 2001). However, several important questions remain about the pathway from normal intrusive or repetitive thoughts to symptom development. First, the majority of existing research has focused on global beliefs about thoughts, which typically are assessed without reference to a specific thought and when participants are at low levels of arousal. Global beliefs about thoughts may therefore differ in important ways from thought appraisals, or the interpretations that occur immediately and with reference to a particular intrusive or repetitive negative thought, and are typically accompanied by strong affect. Appraisals of particular thought occurrences are believed to derive from, and have been found to be moderately correlated with, global beliefs about the corresponding thought type (Purdon, 2001; Steketee et al., 1997). However, research shows that appraisals of particular thoughts explain a significant percentage of variance in outcomes above and beyond that accounted for by general beliefs (Purdon, 2001), suggesting that they may be an important focus of study in their own right.

Second, negative appraisals of obsessional, worried, and ruminative thoughts have been associated with heightened anxiety and depression on trait and general symptom measures (e.g., Freeston, Ladouceur, Thibodeau, & Gagnon, 1992; Langois et al., 2000a; Steketee et al., 2003; Watkins et al., 2005). However, only a handful of studies have assessed the relationship of appraisals to state affect and behaviors immediately following the occurrence of a particular intrusive or repetitive negative thought. These studies have found negative appraisals of all three types of thought to be associated with immediate engagement in escape/avoidance strategies (Langois et al., 2000a,b; Starr & Moulds, 2006). In addition, negative appraisals of specific obsessional thoughts are associated with increases in momentary anxiety and negative affect (Purdon, 2001). Important questions remain about the immediate affective and behavioral correlates of negative appraisals of worried and ruminative thoughts, which have been understudied relative to obsessions. Moreover, little is known about the correlates of positive appraisals, which have been understudied across all three thought types. Further study of the relationship between appraisals and immediate behavioral and emotional responses may help elucidate the process that unfolds following the experience of an intrusive or repetitive negative thought, providing insight into the pathway from normal thoughts to maladaptive behaviors and negative outcomes.

Importantly, cognitive-behavioral and metacognitive theories raise the possibility that reactions to thoughts may have different outcomes in the short-term versus long-term. For example, avoidance of anxiety-provoking stimuli has been found to result in short-term reductions in anxiety but is associated with maintenance of anxiety in the long-term (e.g., Mowrer, 1960; Wolpe, 1958). Therefore, while further cross-sectional

research is valuable in understanding the momentary behavioral and emotional correlates of appraisals, longitudinal research is also necessary to test the temporal hypothesis that appraisals will predict later negative outcomes. Prior longitudinal research has shown that global negative beliefs about all three thought types prospectively predict increases in anxiety, depression, and OCD symptoms (Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006; Coles & Horng, 2006; Papageorgiou & Wells, 2009) and that global positive beliefs about worry predict later avoidance (Sica, Steketee, Ghisi, Chiri & Franceschini, 2007). Only one longitudinal study (Abramowitz, Nelson, Rygwall, & Khandker, 2007), however, has evaluated appraisals of individual thoughts as predictors of negative outcomes. It found that negative appraisals of obsessional thoughts in the first month after the birth of a child partially mediate the relationship between global negative beliefs (measured pre-birth) and OCD symptoms three months postpartum. These findings suggest an important role of immediate, in-situation negative appraisals in predicting later negative outcomes, but leave open questions about intermediate maladaptive behaviors and emotions predicted by negative appraisals and about whether positive appraisals predict a similar pattern.

Questions also remain about whether the findings for obsessions apply to other types of negative thoughts such as worry and rumination. Despite sharing important similarities, theories of symptom development have traditionally focused on distinct disorders and been studied in separate literatures. However, there has been a recent shift towards identifying common processes that may operate across disorders (e.g., Harvey, Watkins, Mansell, & Shafran, 2004). Transdiagnostic study of the pathway from intrusive or repetitive negative thought to negative emotional and behavioral outcomes

may have a number of advantages (Harvey et al., 2004). First, it may improve understanding of comorbidity among the anxiety and mood disorders. If the pathway from thoughts to negative outcomes is found to operate similarly for different types of unwanted thoughts, it would suggest a trait-like tendency to struggle with bothersome thoughts and maladaptive appraisals which may put an individual at risk for multiple anxiety and mood disorders. Identification of common processes that operate across – and confer vulnerability to – a number of distinct disorders may also facilitate the transfer of scientific and treatment advances between disorders that are typically studied in isolation. For example, positive beliefs about intrusive or repetitive negative thoughts, which play an important role in metacognitive theories of worry and rumination, may also be implicated in OCD. Identification of processes that span diagnostic categories may facilitate the development of a unified intervention to prevent or treat multiple disorders or complicated comorbid cases (Barlow, Allen, & Choate, 2004; Harvey et al., 2004; Moses & Barlow, 2006).

The current study aimed to test the association of negative and positive appraisals to clinically meaningful outcomes in the immediate aftermath of the experience of obsessional, worried, and ruminative thoughts and at 1-month follow-up. Negative appraisals of all three thought types were expected to be associated with greater use of avoidance strategies and negative affect, as well as with lower positive affect and daily functioning, at both time points. Negative appraisals were also expected to be associated with increased thought frequency at Time 2. Positive appraisals were expected to exhibit somewhat different associations with immediate versus 1-month outcomes. At Time 1, positive appraisals of all three thought types were expected to be associated with greater

use of avoidance strategies and negative affect, but also with greater positive affect and daily functioning. At Time 2, Time 1 positive appraisals were expected to predict a pattern similar to that predicted for negative appraisals, including diminished positive affect and daily functioning and increased thought frequency. Although a pattern of significant associations was expected between appraisals and outcomes across all three thought types, a further aim of the study was to test whether the strength with which appraisals related to outcomes differed across thought types.

Method

Participants

The Time 1 sample included 265 undergraduate students at a private northeastern university. Participants were 52% ($n = 138$) female and were primarily between the ages of 18 and 22 ($M = 19.5$, $SD = 2.08$). The sample was 61% Caucasian, 24% Asian/Pacific Islander, 8% Black, and 7% other race-ethnicity. Twelve percent of participants identified as Hispanic.

Of the Time 1 sample, 36% ($n = 96$) completed additional measures at 1-month follow-up (Time 2). The subset of participants who completed the follow-up assessment did not differ significantly from the remainder of the sample in demographic characteristics (sex, age, grade point average, use of psychotropic medications), in level of negative or positive appraisals, or in scores on Time 1 outcomes. The sole exception was that a larger proportion of those who completed the follow-up assessment (18%) were receiving counseling or therapy at Time 1 compared to those who did not complete the follow-up assessment (8%), $\chi^2(1, N = 279) = 6.19, p = .019$.

Procedure and Measures

Participants recruited from the psychology department subject pool completed self-report questionnaires on a secure website. Participants were provided with definitions and examples of obsessional, worried, and ruminative thoughts that are commonly reported by college students and have been used in previous research studies with this population (e.g., McLaughlin, Borkovec, & Sibrava, 2007; Teachman, Woody, & Magee, 2006; see Appendix A). They were asked to recall the most recent time they experienced a thought of each type and to briefly describe the content of the thought. They were also asked to indicate the number of times per week, on average, that they experience this particular thought or a similar thought fitting the same definition. This information about thought frequency at Time 1 was used as a covariate in Time 2 analyses, but was not included in Time 1 analyses because it did not represent a momentary experience. Participants then completed a series of measures about each thought. All participants completed the survey in the same order, with questions about obsessional thoughts first, followed by worried thoughts, and finally ruminative thoughts.

Cognitive Intrusions Questionnaire (CIQ). The CIQ (Freeston et al., 1992) asks participants to use a 1-9 Likert scale to rate an individual thought in terms of negative appraisals (e.g., responsibility, controllability) and avoidance strategies used in response to the thought (e.g., distraction, reassurance-seeking). Because the present study aimed to examine positive as well as negative appraisals of thoughts, positive appraisal items were added to the original CIQ. These items were adapted from the Metacognitions Questionnaire Positive Beliefs Subscale (Cartwright-Hatton & Wells, 1997) and the Positive Beliefs about Rumination Scale (Papageorgiou & Wells, 2001) to reflect immediate appraisals of specific thoughts rather than general beliefs about thoughts. At

Time 1, participants were asked to respond to all appraisal and strategy items on the CIQ based on their appraisals and behaviors at the time that they experienced the thought.

Previous studies using the CIQ have typically taken an item-by-item or factor analytic approach to describing the experience of obsessional, worried, and ruminative thoughts in unselected samples (Langlois et al., 2000a,b; Watkins et al., 2005). Factor analyses have yielded five-factor solutions for appraisals of all three thought types and two- or five-factor solutions for avoidance strategies used in response to the three thought types (Langlois et al., 2000b; Watkins et al., 2005). However, the factors generated by these analyses have been difficult to interpret from a theoretical perspective. For parsimony, and because we were looking to test specific hypotheses about negative and positive appraisals, we instead chose to construct theoretically meaningful subscales with face validity for the variables of interest. Selection of the conceptually and psychometrically strongest items (e.g., those with high face validity and highest item-total correlations) resulted in a 38-item scale (see Appendix B) with separate subscales for negative appraisals (e.g., “I believed that the content of the thought means something negative about me”), positive appraisals (e.g., “I believed that the thought might motivate me to get things done”), and avoidance strategies (e.g., “I reassured myself by speaking to somebody”). Cronbach’s alpha ranged from .72-.92 for the three subscales across thought types (see Table 1). Negative and positive appraisals were significantly correlated for each thought type ($r = .48$ for obsession, $.27$ for worry, $.55$ for rumination), but as the magnitude of the correlations suggested that the subscales were nonredundant, negative and positive appraisals were examined in separate analyses.

Positive and Negative Affect Schedule (PANAS). The PANAS assesses negative affect (10 items) and positive affect (10 items), which have been found to represent independent dimensions of emotional experience (Watson, Clark, & Tellegen, 1988). At Time 1, participants were asked to complete the PANAS recalling the way they felt at the time they experienced the thought. Items are rated on a 1-5 Likert scale and are summed to create subscales for positive and negative affect, each of which ranges from 10-50.

Daily Functioning Scale. The Daily Functioning Scale (see Appendix C) was designed for the present study to assess quality of daily functioning for college students (e.g., “felt sociable,” “made progress in work or other activities”). Items for this measure were generated from existing measures of daily functioning and well-being among college students (Butler, Hokanson, & Flynn, 1994; Steger & Kashdan, 2009). Items are rated on a 1-7 Likert scale and are summed into a single score ranging from 15-105. At Time 1, participants were asked to complete this measure recalling the way they felt and behaved on the day that they experienced the thought. The relationship of negative and positive appraisals to functioning in daily life has not previously been addressed in theories or in past studies, and we believed that this association might be clinically meaningful and important in understanding and describing the momentary experience of these thought types in daily life.

One month after completing the Time 1 assessment, willing participants were recontacted and asked to complete follow-up measures online. Follow-up measures included the frequency of each thought type, the CIQ avoidance strategies subscale, the PANAS, and the Daily Functioning Scale. Participants were asked to respond to all

follow-up measures based on their experiences during the past week. Only thought frequency was rated separately for each thought type; follow-up ratings for all other outcomes reflected general experiences over the past week without regard to thought type.

Data Preparation and Statistical Approach

At Time 1, 260 participants provided an obsessional thought, 253 provided a worried thought, and 245 provided a ruminative thought. Prior to analysis, the content of each obsessional, worried, and ruminative thought was examined by both the first author and an independent rater to ensure that each thought was appropriately categorized based on the definitions provided to participants. Interrater reliability was good to excellent for each thought type ($\kappa = .71, .98, \text{ and } .89$ for obsessional, worried, and ruminative thoughts, respectively). Disagreements between raters were discussed until a consensus was reached, and thoughts were excluded from analyses if they were determined to be a poor fit for the thought definitions. This process resulted in a final sample of 245 obsessional thoughts, 252 worried thoughts, and 237 ruminative thoughts at Time 1. Of the 96 participants who also completed measures at Time 2, 87 provided an appropriate obsessional thought, 86 a worried thought, and 81 a ruminative thought at Time 1. To maximize statistical power, all available data were analyzed for each thought type at each time point.

All variables met the statistical assumption of normality, with the exception of thought frequency, which was significantly positively skewed at both time points and was transformed to normality using an inverse transformation (Tabachnick & Fidell, 2007)

prior to analysis. All multiple regression analyses were conducted according to guidelines outlined by Aikin and West (1991).

Results

Cognitive, Behavioral, and Emotional Responses to the Three Thought Types

Descriptive statistics for cognitive, behavioral, and emotional responses to each thought type are presented in Table 2. Responses were compared across the three thought types using repeated-measures ANOVA followed by dependent samples t-tests. Of the three thought types, worry (and to a lesser extent, rumination) showed the strongest appraisals and greatest negative outcomes. Worry and rumination were both associated with more negative appraisals than obsessions, both $t(65) > -3.12$, both $p < .003$. Worry was also associated with the highest level of positive appraisals and the greatest Time 1 thought frequency, followed by rumination, and then obsessions, all $t(73) > 2.09$, all $p < .040$. Further, worry showed the highest negative affect of the three thought types, while both worry and rumination were associated with greater Time 2 thought frequency and avoidance strategies than obsessions, all $t(70) > -2.68$, all $p < .009$. In contrast, rumination tended to show the lowest levels of positive outcomes of the three thought types. Rumination was associated with lower positive affect than either of the other thought types and was also associated with the lowest levels of daily functioning, followed by worry and finally by obsessions, all $t(78) > 2.51$, all $p < .014$.

Negative appraisals across the three thought types were moderately correlated, such that individuals reporting high levels of negative appraisals for one thought type also tended to report high levels of negative appraisals for the other two thought types (r

= .40-.50, all $p < .001$). Positive appraisals showed a similar association across the three thought types ($r = .30$ -.35, all $p < .001$).

Association of Appraisals to Behavioral and Emotional Outcomes

Immediate outcomes. Separate regression analyses were performed for obsessional, worried, and ruminative thoughts to test the hypothesis that negative appraisals of these thoughts would be associated with immediate behavioral and emotional outcomes (see Table 3). Across all three thought types, negative appraisals were significantly associated with greater use of avoidance strategies, greater negative affect, and lower daily functioning, all $\beta > .16$, all $p < .020$. Negative appraisals were not significantly associated with positive affect for any thought type, all $\beta < .10$, all $p > .230$.

Analyses were repeated to test the association of positive appraisals of each thought type with behavioral and emotional outcomes. Like negative appraisals, positive appraisals of all three thought types were associated with greater use of avoidance strategies and greater negative affect, all $\beta > .13$, all $p < .040$. However, positive appraisals were also associated with greater positive affect, all $\beta > .30$, all $p < .001$, and, for worry, with higher daily functioning, $\beta = .14$, $p = .041$.

Follow-up outcomes. Negative and positive appraisals of obsessional, worried, and ruminative thoughts were expected to predict behavioral and emotional outcomes at 1-month follow-up. This hypothesis was tested using hierarchical multiple regression, with the Time 1 outcome entered on the first step and the Time 1 appraisal entered on the second step. Time 1 outcomes were included as a covariate to test whether the Time 1 appraisal uniquely predicted change in the outcome at Time 2, above and beyond variance contributed by the Time 1 outcome.

Contrary to predictions, Time 1 negative and positive appraisals were not significant predictors of most outcomes at 1-month follow-up. The few exceptions related mainly to rumination (see Table 4). Time 1 negative appraisals of rumination and worry predicted increases in the frequency of ruminative and worried thought, respectively, at 1-month follow-up, both $\beta > .31$, both $p < .004$. Time 1 positive appraisals of rumination also predicted increased ruminative thought frequency as well as greater negative affect at 1-month follow-up, both $\beta > .32$, both $p < .005$.

Differences between thought types. T-tests for differences between dependent correlations (Cohen & Cohen, 1983) were used to test the possibility that the strength of association between appraisals and outcomes differs across thought types. At Time 1 (see Table 3), negative appraisals of worry were more strongly associated with daily functioning than were negative appraisals of obsessions, $t(237) = 3.34$, $p < .050$. Positive appraisals, in contrast, tended to be more strongly associated with negative outcomes for obsessions and rumination than for worry. At Time 1, positive appraisals of obsessions and rumination were more strongly associated with avoidance strategies and negative affect than were positive appraisals of worry, all $t(237) > 2.13$, $p < .050$. There were no significant differences between thought types at Time 1 in the strength of relationship between appraisals and positive affect, all $t(237) < 1.99$, all $p > .050$. At Time 2 (see Table 4), both negative and positive appraisals tended to be more strongly related to negative outcomes for rumination than for other thought types. Prior negative appraisals of rumination were more strongly associated with thought frequency than prior negative appraisals of obsessions, $t(81) = 2.46$, $p < .050$, and prior positive appraisals of rumination were more strongly associated with negative affect than were prior positive

appraisals of obsessions and worry, $t(81) = 6.80$, $p < .050$. There were no significant differences between thought types in the strength of relationship between prior appraisals and avoidance, positive affect, or daily functioning at Time 2, all $t(81) < 1.69$, all $p > .050$.

Disentangling the Contributions of Negative and Positive Appraisals

Test for unique associations of negative and positive appraisals with outcomes. Because negative and positive appraisals have rarely been studied together (and positive appraisals have been understudied in general), we also wanted to test whether each type of appraisals makes a unique contribution to the prediction of negative outcomes or alternatively, whether the contribution of positive appraisals may be due solely to overlap with negative appraisals. Therefore, follow-up analyses were conducted to test whether negative and positive appraisals shared unique associations with outcomes, each controlling for the other. This was tested through a series of hierarchical multiple regression analyses in which positive (or negative) appraisals were entered on the first step and negative (or positive) appraisals were entered on the second step. Even when positive appraisals were entered first into the model, negative appraisals of all three thought types remained significantly associated with Time 1 avoidance strategies, negative affect, and daily functioning (all $\beta > .31$, all $\Delta R^2 > .05$, all $p < .008$). When negative appraisals were entered first, positive appraisals of all three thought types remained significantly associated with Time 1 avoidance strategies and positive affect (all $\beta > .22$, all $\Delta R^2 > .05$, all $p < .025$). However, positive appraisals were no longer associated with negative affect or daily functioning for any thought type (all $\beta < .18$, all $\Delta R^2 > .02$, all $p > .203$).

At 1-month follow-up, Time 1 negative appraisals of worry ($\beta = .27$, $\Delta R^2 = .07$, $p = .013$) and rumination ($\beta = .31$, $\Delta R^2 = .06$, $p = .036$) remained significant predictors of thought frequency when controlling for Time 1 positive appraisals. Time 1 positive appraisals of rumination no longer predicted Time 2 thought frequency when controlling for negative appraisals, $\beta = .07$, $\Delta R^2 = .00$, $p = .661$, but remained a significant predictor of Time 2 negative affect, $\beta = .52$, $\Delta R^2 = .16$, $p = .001$.

Discussion

The current study aimed to test the association of negative and positive appraisals to negative and positive outcomes immediately following the experience of obsessional, worried, and ruminative thoughts and at 1-month follow-up. As hypothesized, negative appraisals of all three thought types were associated with immediate negative outcomes, including greater use of avoidance strategies, higher negative affect, and lower daily functioning. Positive appraisals of all three thought types were similarly associated with immediate negative outcomes, including greater use of avoidance strategies and higher negative affect, but were also associated with positive outcomes, including greater positive affect and, for worry, higher daily functioning.

While cognitive-behavioral and metacognitive theories both emphasize that negative interpretations about thoughts play an important role in predicting negative outcomes, metacognitive theory further hypothesizes that the pathway from thoughts to symptom development begins with positive beliefs about thoughts, which predict increased purposeful engagement in repetitive thought and may coexist with or give rise to negative beliefs (Papageorgiou & Wells, 2001; Salkovskis, 1985; Wells, 1995). Across all three thought types, findings regarding the immediate correlates of negative

and positive appraisals are consistent with cognitive-behavioral and metacognitive theories and with past research findings (e.g., Langlois et al., 2000a, b; Purdon, 2001). However, theories have not elaborated on correlates of positive appraisals other than thought frequency (e.g., positive affect, daily functioning) and this was the first study to test these associations. While it is not surprising that positive appraisals would be associated with other positive experiences immediately following the experience of an intrusive or repetitive negative thought, this finding provides important new information in understanding momentary experiences of these thought types. Following a recent review of the literature, Watkins (2008) concluded that repetitive thought may be associated with unconstructive (e.g., depression or anxiety) or constructive (e.g., recovery from depression or upsetting events) consequences, depending in part on features of the individual's experience, such as their mood at the time of the thought. Findings from the present study are consistent with this possibility, in that they show that affect at the time of the thought is related to appraisals regarding the positive meaning or function of the thought, or the individual's ability to deal with the thought. However, it is unclear from these findings whether positive experiences in the immediate aftermath of a thought will also be predictive of later constructive consequences of the thought.

Further, cognitive-behavioral and metacognitive models propose that appraisals precede other outcomes related to these thought types. This hypothesis cannot be sufficiently addressed in cross-sectional research, but rather requires longitudinal study designed to establish temporal priority between variables. Therefore, an additional aim of the present study was to test whether negative and positive appraisals are associated with negative and positive outcomes at 1-month follow up, when controlling for the

individual's experience at the time of the thought. Unfortunately, longitudinal findings from the present study are difficult to interpret because Time 1 negative and positive appraisals did not predict most outcomes at 1-month follow-up. There may be a number of methodological and theoretical explanations for this pattern of findings. First, we controlled for Time 1 outcomes in analyses predicting Time 2 outcomes, which allowed us to test for change over time and provided a rigorous test of the temporal claims made by cognitive-behavioral and metacognitive models. However, the Time 1 outcomes that were entered first into the model explained an extremely high percentage of the variance such that there was not much left over for Time 2 outcomes to predict, making this test quite conservative. Second, the experiences assessed at Time 1 versus Time 2 differed in important ways. At Time 1, individuals reported on their experiences at the time of a negative thought, while at Time 2, they reported on their experiences in general over the past week. It may be that the hypothesized processes are not stable across these different situations, particularly in a healthy sample in which we might expect individuals to bounce back quickly from the experience of a negative thought.

A third and related concern is that data are not yet available to suggest the time frame over which the hypothesized processes occur in healthy or in clinical samples. It is therefore unclear how near or far into the future we should be looking to see the effects of appraisals on outcomes and it may be that 1 month is not an appropriate time frame over which to assess these relationships. Finally, it may be that the relationship among appraisals and outcomes over time differs for healthy individuals compared to those with, or at high risk of developing, anxiety or mood disorders. Consistent with this possibility, the only previous longitudinal study of appraisals found associations between negative

appraisals and later outcomes and was conducted among women in the postpartum period, which is associated with increased risk for unwanted intrusive thoughts and onset of OCD symptoms (Abramowitz et al., 2007). Metacognitive theory actually allows for differences between healthy and clinical populations in the relationship between appraisals and outcomes, suggesting that positive beliefs may be found in healthy and clinical samples alike, while negative beliefs may distinguish these two groups (Wells, 1995).

To the extent that we were able to predict Time 2 outcomes, we found that both negative and positive appraisals were associated with more negative outcomes. Negative appraisals of worried and ruminative thoughts at Time 1 predicted increased thought frequency 1 month later. For rumination, positive appraisals at Time 1 also predicted increased thought frequency, as well as increased negative affect at 1-month follow-up. It is interesting that negative appraisals of obsessional thoughts did not predict Time 2 obsessional thought frequency, given that negative appraisals have garnered the most interest for obsessions out of the three thought types studied here. Further, Time 1 negative and positive appraisals were more consistently associated with Time 2 outcomes in general for rumination than for the other two thought types. A few features of the current study may account for these findings. First, it may be that the sample used in the present study was simply a worse analogue for the study of obsessional thoughts than it was for the study of worried and ruminative thoughts. Participants reported less frequent obsessional than worried and ruminative thoughts at both time points, and they were considerably less bothered by these thoughts (in terms of appraisals, affect, and daily functioning) than they were by the other two thought types. This may indicate that the

processes assessed in the present study were not as important for nonclinical obsessions as they were for nonclinical worry and rumination. Alternatively, these findings may be a feature of the transdiagnostic measures used in the present study (e.g., negative and positive appraisals scale), which may not have included as many items relevant to obsessions as to the other thought types.

We also conducted a series of follow-up analyses aimed at disentangling the contributions of negative and positive appraisals. Importantly, negative and positive appraisals each shared unique associations with outcomes when controlling for the other, suggesting that they represent independent processes across all three thought types. Associations were largely in the expected direction, with negative appraisals associated with greater negative affect and lower daily functioning, and positive appraisals associated with greater positive affect. However, we were surprised that both negative and positive appraisals were uniquely associated with greater use of avoidance strategies across all three thought types. One possible explanation for these findings lies in the content of the avoidance strategies scale used in the present study. Most items reflect purposeful responses to thoughts that are non-pathological (e.g., dwelling, analyzing, or meaning-making) or even adaptive (e.g., use of distraction). Positive appraisals may therefore be associated with these reflective and purposeful responses to thoughts, while negative appraisals may be associated with less adaptive avoidance strategies (e.g., neutralizing the thought by a mental or physical action). It should be emphasized that the internal consistency of the avoidance strategies scale was quite high across all three thought types, suggesting that scale items hang together to measure a unitary construct, and it is therefore unlikely that negative and positive appraisals are associated with

endorsement of different sets of scale items. However, scale items are vaguely worded such that the interpretation or valence of several avoidance strategy items may be influenced by the meaning or emotion attributed to the thought. For example, a person experiencing a positive thought appraisal may engage in evaluating or dwelling on the meaning of a thought because she thinks that it will be valuable and helpful for her and because she experiences positive affect while doing so, while a person experiencing a negative thought appraisal may engage in the same behavior because she feels driven to do so or because of anxiety or negative affect. This explanation would be consistent with Watkins' (2008) recent review, which found that the consequences of repetitive thought may be accounted for by factors such as the valence of the thought content or the cognitive, affective, interpersonal, and situational context of the individual.

Findings from the present study must be interpreted in the context of several limitations. First, momentary responses to intrusive or repetitive negative thoughts were assessed retrospectively, and so may be subject to recall biases. For example, it is possible that participants' mood at the time of the survey influenced their responding to questions about their experiences at the time of each thought. Participants may also have simply been unable to recall their experiences at the time of each thought. Further, cognitive-behavioral and metacognitive theories propose that the pathway from unwanted thoughts to negative outcomes begins with appraisals, which then lead to avoidance behavior and negative affective experiences, and ultimately to symptom development. A true test of these theories would therefore require assessment in real time, as the process unfolds. Because the present study included retrospective assessment and provided only a snapshot of the experience of intrusive or repetitive negative thoughts at two time

points, we cannot definitively determine whether appraisals preceded other outcomes (as the theories suggest) or whether experiences may have unfolded in a different order. For example, it may be that depressed mood leads to rumination and negative appraisals. Future tests of cognitive-behavioral and metacognitive models may be strengthened considerably by the use of an experience sampling approach, in which data are collected repeatedly over several days or weeks for each participant. Experience sampling methodology has several advantages, including (a) examination of appraisals and outcomes across time in a naturalistic setting, as processes unfold within the individual as well as at the group level; and (b) real-time assessment, which minimizes recall errors resulting from retrospective reporting and allows for precise investigation of the immediate antecedents of outcomes of interest as well as assessment at the global level averaged across assessments.

The present study was further limited by the use of an unselected, college student sample in that participants were relatively high functioning and consequently may not be representative of the broader population. An additional threat to external validity in the current study is the fact that participants who reported receiving treatment were more likely than those not receiving treatment to participate in the 1-month follow-up, suggesting that the 1-month follow-up sample may not have been representative of the overall study sample. The study of risk factors influencing the transition from healthy and normal experiences to pathological ones is important because it may allow for early identification and intervention with at-risk individuals. However, it can be difficult to identify the appropriate sample in which to address these questions because individuals who are not at risk of developing a disorder and those who already meet criteria for a

disorder may differ in important ways from the target study group of individuals who are at risk of crossing the diagnostic boundary. Future tests of these models would be strengthened by the use of longitudinal studies testing whether appraisals prospectively predict which individuals will go on to develop mood or anxiety disorders.

Finally, although the assessment of multiple thought types for each participant enabled a more direct comparison of thought types and consequently served as a particularly powerful test of the transdiagnostic hypothesis, it also introduced a number of limitations. First, it added assessment burden, increasing the chances that participants became bored or fatigued during the course of the study. Second, all participants completed the survey in the same order, which may have introduced carryover effects, in which the experience of answering questions about thought types early in the survey (i.e., obsessions or worry) influenced responses related to thought types that came later (i.e., worry or rumination). Future research should use designs that minimize carryover effects or use a between-subjects design in which each participant contributes only one thought. Finally, evaluation of our transdiagnostic hypotheses required a separate series of hypothesis tests for each thought type, which increased the chances of a Type 1 error. Consistent patterns of findings across outcomes and thought types increase confidence that we are converging on true associations between appraisals and outcomes. However, further confidence will require replicating findings in new samples.

Despite these limitations, findings from the present study may have a number of important implications. First, although we found differences between thought types in levels of cognitive, behavioral, and emotional responses and in the amount of variance explained by negative and positive appraisals, the overall pattern of associations between

negative and positive appraisals and immediate outcomes was remarkably similar across the three thought types. Providing further support for a transdiagnostic model, positive appraisals, which have previously been studied only with respect to worry and rumination, not only were associated with immediate outcomes for obsessional thoughts but were actually more strongly associated with a few outcomes (avoidance and negative affect) for obsessions than for worry in cross-sectional analyses. Item-by-item examination showed that participants did not only endorse positive appraisal items that were phrased as the reverse of negative appraisal items or disorder symptoms (e.g., control over thought occurrences). Rather, positive appraisals about the function of obsessional thoughts (e.g., that the thought might help to prepare for future events) were also endorsed at a high rate. Given the parallels between cognitive-behavioral and metacognitive theories of the three thought types, it is unsurprising that constructs found to be important to worry and rumination would also extend to obsessions. However, this discovery contributes to our understanding of the momentary experience of obsessive thoughts and suggests new similarities across the three thought types.

Findings related to positive appraisals may have clinical implications for the treatment of disorders characterized by intrusive or repetitive negative thought. Results from longitudinal data suggest a process in which individuals may hold onto the belief that intrusive or repetitive negative thoughts will be helpful in some way, despite their association with increased negative affect over time. At the same time, results from cross-sectional data provide some support for the belief that these thoughts will be helpful in some way by showing that positive appraisals are concurrently associated with higher levels of positive affect. These findings suggest a complex pattern of associations

with positive appraisals that should be explored in future research. A recently developed GAD treatment targets worry in individuals with GAD in part through a focus on modifying erroneous positive beliefs about worry (Ladouceur, Dugas, Freeston, Leger, Gagnon, & Thibodeau, 2000). Findings from the present study suggest that it may be clinically helpful to similarly address positive beliefs about other forms of intrusive or repetitive negative thought, including obsessions and rumination.

Results from the present study also suggest that it may be valuable for future research to assess positive appraisals and positive outcomes (e.g., positive affect, daily functioning). Research to date has focused almost exclusively on describing negative outcomes, despite the fact that many responses to these thoughts (e.g., avoidance) actually result in short-term reductions in negative outcomes and may even increase positive momentary outcomes. For example, one recent study found that thought suppression among individuals with OCD, while globally associated with poorer functioning, actually led to short-term improvements in functioning (e.g., anxiety level, ability to adhere to daily schedule) when assessed at the level of individual thought occurrences (Purdon, Rowa, & Antony, 2007). These findings provide valuable insight into a possible factor that may reinforce and maintain thought suppression attempts, raising the possibility that intrusive or repetitive negative thoughts may be similarly reinforced and maintained through short-term positive experiences (Borkovec, 1994).

While further research is necessary to clarify the relationship of appraisals to later outcomes across all three thought types, results from the present study support further transdiagnostic tests by showing important similarities in cognitive-behavioral and metacognitive processes across thought types. The present findings also hint at the

possible utility of a transdiagnostic intervention to target appraisals. In addition to finding a similar pattern of associations between appraisals and immediate outcomes across thought types, we found support for a trait-like tendency to experience negative and positive appraisals across distinct thought types. These findings suggest that appraisals may operate independently of thought type, raising the possibility that a subset of individuals may struggle with maladaptive appraisals—and associated maladaptive outcomes—related to multiple forms of negative thought.

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Table 1

Psychometric Properties of Study Measures

Measure	# of Items	Cronbach's α		
		Obsession (<i>N</i> = 245)	Worry (<i>N</i> = 252)	Rumination (<i>N</i> = 237)
CIQ				
Negative appraisals	12	.85	.85	.87
Positive appraisals	7	.74	.73	.72
Avoidance strategies	19	.88	.84	.92
PANAS				
Positive affect	10	.92	.91	.93
Negative affect	10	.87	.83	.87
Daily Functioning Scale	15	.92	.89	.87

Note. CIQ = Cognitive Intrusions Questionnaire; PANAS = Positive and Negative Affect Schedule.

Table 2

Descriptive Statistics for Cognitive, Behavioral, and Emotional Responses to the Three Thought Types

Measure	Obsession (<i>N</i> = 245)	Worry (<i>N</i> = 252)	Rumination (<i>N</i> = 237)
Appraisals			
Negative appraisal	53.21 (17.97) _a	61.39 (17.12) _b	62.60 (17.84) _b
Positive appraisal	27.16 (10.08) _a	34.58 (9.80) _b	31.55 (9.80) _c
Outcomes			
Thought frequency ^d			
Time 1	2.60 (5.55) _a	4.35 (8.74) _b	3.70 (12.84) _c
Time 2	4.14 (7.64) _a	5.03 (6.89) _b	4.76 (5.60) _b
Avoidance strategies	76.21 (26.78) _a	86.64 (25.87) _b	83.43 (29.24) _b
Negative affect	24.13 (8.62) _a	26.29 (7.73) _b	25.27 (7.89) _a
Positive affect	19.96 (9.21) _a	21.04 (8.65) _a	17.97 (8.19) _b
Daily functioning	55.61 (17.64) _a	52.47 (15.53) _b	50.32 (15.09) _c

Note. *M* (*SD*) for obsessional, worried, and ruminative thoughts within each row that do not share the same subscript differ from one another ($p < .05$).

^dTime 1 thought frequency was measured in terms of the number of occurrences in a typical week. Time 2 thought frequency was measured in terms of the number of occurrences in the week prior to the Time 2 assessment.

Table 3

Cross-Sectional Associations of Negative and Positive Appraisals with Behavioral and Emotional Outcomes

Predictor	N	Avoidance Strategies		Negative Affect		Positive Affect		Daily Functioning	
		β	R^2	β	R^2	β	R^2	β	R^2
Negative appraisals									
Obsession	245	.66***	.44	.62***	.38	.09	.01	-.16*	.03 _a
Worry	252	.60***	.35	.59***	.35	-.08	.01	-.35***	.12 _b
Rumination	237	.62***	.38	.55***	.30	.10	.01	-.26***	.07
Positive appraisals									
Obsession	245	.58***	.34 _a	.31***	.10 _a	.30***	.09	.09	.01
Worry	252	.48***	.23 _b	.13*	.02 _b	.36***	.13	.14*	.02
Rumination	237	.60***	.37 _a	.35***	.12 _a	.35***	.12	.09	.01

Note. R^2 within columns that do not share the same subscript differ from one another ($p < .05$).

* $p < .05$. *** $p < .001$

Table 4

Prospective Associations of Negative and Positive Appraisals with Outcomes, Above and Beyond Time One Outcomes

Predictor	N	Thought Frequency		Avoidance Strategies		Negative Affect		Positive Affect		Daily Functioning	
		β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Negative appraisals											
Obsession	87	.16	.03 _a	-.06	.00	.06	.00	-.04	.00	-.12	.01
Worry	86	.31**	.09	.10	.01	-.01	.00	-.09	.01	.03	.00
Rumination	81	.40**	.16 _b	.06	.00	.11	.01	-.20	.04	-.01	.00
Positive appraisals											
Obsession	87	.03	.00	.02	.00	.11	.01 _a	.02	.00	-.01	.00
Worry	86	.01	.00	.01	.00	.09	.01 _a	.05	.00	-.02	.00
Rumination	81	.32**	.10	.14	.01	.40**	.14 _b	-.12	.01	.09	.01

Note. ΔR^2 within columns that do not share the same subscript differ from one another ($p < .05$).

** $p < .01$

Chapter 2 Appendix A

Thought Definitions

(Obsession): A thought you didn't really want to have that popped into your head unexpectedly, and may be socially unacceptable or contrary to how you try to live your life. Some examples of thoughts of this type include:

1. Driving a car off the road or swerving into traffic
2. Insulting strangers or family
3. That you might have left the stove on
4. That you might have left your home unlocked
5. Sex in public or with an unacceptable person
6. Catching an STD or other disease or illness

(Worry): A thought about a potential negative future event or catastrophe. Some examples of thoughts of this type include:

1. That I may never achieve my goals or ambitions
2. That I may not keep up with my work
3. That I may not be able to afford things or pay my bills
4. That I may lose close friends or relationships

(Rumination): A thought about a negative mood or feeling that you are experiencing OR about a past problem or failure. Some examples of thoughts of this type include:

1. That I feel so down
2. That I don't have any energy
3. That I did poorly on an exam
4. That I think I hurt someone's feelings yesterday

*Chapter 2 Appendix B***Cognitive Intrusions Questionnaire****Negative Appraisals Scale**

At the time you experienced this thought, how much did you believe:

1. ...that the thought was correct
2. ...that the thought might interfere with my ability to work/get on with other things
3. ...that the thought might be constantly in the back of my mind
4. ...that the thought was about a real problem or situation
5. ...that the situation described by the thought is likely to come true
6. ...that it's against my beliefs to have such thoughts
7. ...that if the thought came true there would be serious consequences
8. ...that I feel responsible for the occurrence of the thought
9. ...that I feel responsible for the situation described by the thought
10. ...that the content of the thought is personally important
11. ...that the content of the thought reveals something negative about me
12. ...that the thought might make it difficult to make day-to-day decisions

Positive Appraisals Scale

At the time you experienced this thought, how much did you believe:

1. ...that the problem described by the thought could be changed or solved
2. ...that I had the ability to solve the problem described in the thought
3. ...that I don't have to have the thought if I don't want to
4. ...that the situation described by the thought is something I need to understand
5. ...that the content of the thought reveals something positive about me
6. ...that the thought might motivate me to get things done
7. ...that the thought might help me to prepare for future events

Avoidance Strategies Scale

People do many different things when this type of thought gets into their mind. Please rate how much you used each of the following approaches at the time that you experienced this thought:

1. I distracted myself with things around me
2. I did things that need concentration
3. I replaced the thought by another more pleasant thought
4. I told myself "stop"
5. I reassured myself by speaking to somebody
6. I reprimanded myself

7. I told myself it means nothing
8. I neutralized it by a mental or physical action
9. I replaced the thought by another unpleasant thought or minor problem
10. I analyzed the situation or problem described by the thought
11. I tried to find a solution
12. I dwelled on the causes and the implications of the situation described by the thought – why it happened or why it might happen
13. I focused on the details of the situation described by the thought – how it happened or how it might happen
14. I evaluated what the thought and the situation described by the thought mean about me
15. I thought about what I can learn from the situation described in the thought
16. I dwelled on positive aspects of myself
17. I dwelled on negative aspects of myself
18. I planned how I can avoid the situation described by the thought
19. I dwelled on the consequences of the situation described by the thought

Chapter 2 Appendix C

Daily Functioning Scale

This scale consists of a number of statements that describe different feelings and activities. Please read each item and indicate to what extent you experienced each feeling or engaged in each activity on the day when you experienced this thought.

1. Felt sociable
2. Interacted with other people
3. Felt productive
4. Made progress in work or other activities
5. Felt interested in coursework or other activities
6. Attended to coursework or other activities
7. Felt distracted
8. Avoided work or other activities
9. Procrastinated getting started on your work or other activities
10. Felt energetic or lively
11. Engaged in physical activity
12. Felt well-rested
13. Slept well
14. Felt relaxed
15. Engaged in leisure activities

Chapter 3:

Do Negative Appraisals of Unwanted Thoughts Lead to Negative Outcomes? An
Experimental Test of the Effect of Negative Appraisals across Thought Types

Abstract

Cognitive-behavioral and metacognitive theories of generalized anxiety disorder, major depressive disorder, and obsessive-compulsive disorder propose that negative interpretations of normal intrusive or repetitive negative thoughts lead to symptoms of anxiety and depression. However, these causal claims have rarely been tested using experimental methods, and most research to date has only examined obsessional thoughts, despite similarities between theoretical models of obsessions and those of worry and rumination. In the present study, healthy participants were randomly assigned to receive negative, normalizing, or no feedback about each of these thought types to test the hypothesis that negative appraisals lead to increased negative outcomes across thought types. Additional analyses were conducted to determine whether individuals' preexisting beliefs about thoughts also predicted outcomes, either alone or in interaction with experimental condition. The effect of negative feedback was unexpected, with individuals in the Negative Feedback condition reporting less negative outcomes than those in the other conditions. However, these results were qualified by an interaction between preexisting beliefs and experimental condition, such that the negative feedback seemed to have the expected effect on outcomes only for those individuals who came into the study with preexisting negative beliefs about thoughts. Overall, results are consistent with a transdiagnostic model in which long-held negative beliefs about thoughts act as a cognitive vulnerability in interaction with specific environmental stressors.

Do Negative Appraisals of Unwanted Thoughts Lead to Negative Outcomes? An
Experimental Test of the Effects of Negative Appraisals across Thought Types

Anxiety and mood disorders are among the most prevalent mental disorders in the US, with approximately 21% to 29% of adults meeting diagnostic criteria during their lifetime (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Cognitive-behavioral theories, which emphasize the role of thought processes in causing feelings and behaviors, have been highly influential in our understanding and treatment of these disorders. More recently, metacognitive theories have led to new advances through a related but narrower focus on individuals' beliefs and thoughts about their own thinking (Wells, 1997; 2000; Wells & Matthews, 1994). Although cognitive-behavioral and metacognitive theories of different anxiety and mood disorders have developed independently, all share the common assertion that negative mental health consequences result from misinterpretations of internal or external experiences (Beck, 1964; Ellis, 1962; Wells, 1997).

Intrusive or repetitive negative thought represents one internal experience hypothesized to result in anxiety or mood symptoms when misinterpreted as uncontrollable, dangerous, or harmful (Papageorgiou & Wells, 2001; Rachman, 1997; Wells, 1995). Generalized anxiety disorder (GAD), major depressive disorder (MDD), and obsessive-compulsive disorder (OCD) each include some form of intrusive or repetitive negative thought as a core feature in the etiology and experience of the disorder. Worry, which is the central feature of GAD, is future-focused and is characterized by a predominance of verbal thought and an abstract processing style (Ehring & Watkins, 2008). The rumination commonly found in MDD is similarly verbal and abstract, but tends to be focused on the past or present rather than the future (Ehring & Watkins, 2008). In contrast, the obsessions

characteristic of OCD tend to include imagery rather than verbal thought (Langlois, Freeston, & Ladouceur, 2000a, b; Wells & Morrison, 1994). However, all three thought types share important similarities, including that they are typically unwanted and are associated with negative emotions and loss of mental control (Langlois et al., 2000b; Papageorgiou, 2006).

Importantly, because each thought type is commonly experienced by nonclinical populations, its clinical relevance is determined by the frequency, intensity, and distress with which it is experienced (Langlois et al., 2000b; Papageorgiou, 2006). Cognitive-behavioral and metacognitive theories of GAD, MDD, and OCD each propose that the pathway from normal intrusive or repetitive negative thoughts to symptom development begins when these thoughts are followed by negative appraisals, or interpretations of the thoughts as dangerous or threatening. Negative appraisals of particular thought occurrences are believed to stem from the individual's global beliefs about the corresponding thought type (Purdon, 2001; Steketee et al., 1997) and are hypothesized to lead to attempts to monitor thoughts and to control them through engagement in avoidant behavior. Across thought types and disorders, negative appraisals and the avoidant behavior that follows them, rather than the thoughts themselves, are believed to cause symptoms of anxiety and depression (Papageorgiou & Wells, 2003; Salkovskis, 1985; Wells, 1995).

Research on cognitive-behavioral and metacognitive theories supports the proposed associations between negative interpretations of thoughts and anxiety and mood symptoms. Global negative beliefs and negative appraisals of particular obsessional, worried, and ruminative thoughts have been associated with cognitive avoidance and compulsive activities, as well as negative affect and symptoms of anxiety, depression, and OCD (e.g.,

Freeston, Ladouceur, Thibodeau, & Gagnon, 1991; 1992; Langois et al., 2000a; Purdon, 2001; Starr & Moulds, 2006; Steketee et al., 2003; Watkins, 2004). Further, in the only longitudinal study to date, negative appraisals of obsessional thoughts experienced in the first month after the birth of a child were found to partially mediate the relationship between pre-birth global negative beliefs about thoughts and OCD symptoms three months postpartum. Overall, this body of research is consistent with the central premise of cognitive-behavioral and metacognitive models, that negative interpretations of thoughts play an important role in the pathway from normal thoughts to symptom development. However, previous tests of these theories have been limited in several important respects.

First, most studies have used cross-sectional designs, despite the inability of these designs to test the causal hypotheses proposed by theoretical models. In an effort to more rigorously test these causal claims, a rare series of experiments have induced OCD-relevant appraisals in nonclinical samples. One recent study found that experimentally induced appraisals of responsibility and thought-action fusion (the tendency to assume incorrect causal relationships between thoughts and external reality) led to increased discomfort and efforts to resist thoughts (Rassin, Merckelbach, Muris, & Spaan, 1999). A separate series of studies experimentally manipulated appraisals concerning the personal meaning and morality of intrusive thoughts (Teachman & Clerkin, 2007; Teachman, Woody, & Magee, 2006). Notably, explicitly reported reactions to the feedback (e.g., state self-esteem) in this study were predicted only by preexisting beliefs about thoughts but not by the experimental manipulation. However, implicit self-evaluation was predicted by the interaction of experimentally induced appraisals and preexisting beliefs about thoughts, such that higher levels of preexisting negative beliefs predicted a stronger response to the feedback about the

personal meaning and morality of thoughts (Teachman & Clerkin, 2007). Finally, in related research, a psychoeducational intervention correcting negative appraisals and maladaptive avoidance behavior was found to reduce anxiety symptoms among undergraduate students who reported subclinical OCD (Zucker, Craske, Blackmore, & Nitz, 2006). Taken together, experimental and intervention research suggests that appraisals of obsessional thoughts may have important effects on behavioral and emotional experience, even among nonclinical samples. However, important questions remain about the causal role of appraisals on clinically meaningful outcomes (e.g., affect, avoidant behavior) among healthy samples, particularly with regard to worry and rumination, which have been understudied relative to obsessions.

Second, most research on negative appraisals has been disorder-specific, despite parallels across disorders and a recent shift in the literature towards identifying common processes that may operate across diagnostic categories. Intrusive or repetitive negative thought is particularly well-suited to transdiagnostic study, having been identified as a central feature across multiple anxiety and mood disorders (Ehring & Watkins, 2008; Harvey, Watkins, Mansell, & Shafran, 2004). Transdiagnostic study of the pathway from intrusive or repetitive negative thought to symptom development may have a number of advantages. If the effect of negative appraisals on negative outcomes is similar across distinct thought types, it would suggest that GAD, MDD, and OCD may share this common risk factor, providing a possible explanation for why these disorders so frequently co-occur. Further study of processes that span diagnostic categories may also facilitate the transfer of scientific and treatment advances between disorders that are typically studied in isolation, leading to the identification of a single intervention to

prevent or treat multiple disorders or complicated comorbid cases (Harvey et al., 2004). For example, if appraisals of intrusive or repetitive negative thoughts were found to operate similarly across disorders in conferring risk or resilience, an intervention to modify negative appraisals of obsessions (e.g., Zucker et al., 2006) may then be extended to worry and rumination.

In order to address these gaps in the literature, the present study manipulated appraisals of normal intrusive or repetitive negative thoughts by providing either negative, normalizing or no feedback about the severity of these thoughts. Each of these feedback conditions was compared on a set of clinically meaningful outcomes including behavioral (urge to avoid the thought and its practical or emotional consequences) and emotional measures (negative and positive affect) that are relevant for both clinical and healthy populations. Based on results from previous studies (Langlois et al., 2000a; Watkins, Moulds, & Mackintosh, 2005), we expected that the three thought types would differ in levels of these negative outcomes, but this was not a primary hypothesis of the study. We had two objectives. The first was to test the impact of experimentally manipulating appraisals of obsessional, worried, and ruminative thoughts on subsequent outcomes. Across all three thought types, experimentally induced negative appraisals were expected to increase negative affect and the urge to avoid and to decrease positive affect relative to normalizing feedback and no feedback. Normalizing feedback was expected to have the opposite effect, decreasing negative affect and urge to avoid and increasing positive affect relative to the negative feedback and no feedback conditions.

The second objective of the present study was to test whether participants' preexisting negative beliefs about thoughts interacted with experimentally induced

appraisals in predicting outcomes. Based on previous findings from Teachman and colleagues (2007), we expected higher levels of preexisting negative beliefs to predict greater negative affect and urge to avoid and less positive affect among those assigned to receive negative feedback, but not among those assigned to receive normalizing or no feedback.

Method

Participants

The sample consisted of 98 undergraduate students at a private northeastern university. Participants were primarily female (56%; $n = 55$) with a mean age of 19.76 ($SD = 2.05$). The sample was 49% Caucasian, 33% Asian/Pacific Islander, 12% Black, and 6% other race-ethnicity. Twelve percent of the sample identified as Hispanic. Because we were interested in experimentally manipulating appraisals in a healthy sample, and in order to protect those who may experience excessive distress as a result of receiving negative feedback about their thoughts, individuals who reported a current or lifetime history of GAD ($n = 7$), depression ($n = 9$), or OCD ($n = 1$) were excluded from participating in the study.

Design

The study used a 3x3 mixed factorial design. The between-subjects factor was experimental condition (Negative, Normalizing, No Feedback). The within-subjects factor was thought type (obsessional, worried, ruminative). Order of thought types was counterbalanced within each condition.

A power analysis was conducted using GPower to estimate the sample size necessary to detect an interaction between experimental condition and thought type.

Effect sizes from previous research were in the moderate range ($d = 0.32$; Teachman & Clerkin, 2007) and were submitted to the power analysis, which indicated that a power level of 0.80 (with $\alpha = .05$ level) would be achieved with a total sample size of 96 (32 per condition).

Measures

Pre-manipulation measures. Before receiving any instructions related to the experimental manipulation, participants completed the Metacognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997) and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The MCQ assesses five domains of beliefs about worry and intrusive thoughts. Items are rated on a Likert scale from 1 (*do not agree*) to 4 (*agree very much*) and are summed within subscales. We used only the two negative beliefs subscales in the present study: Negative Beliefs about the Controllability of Thoughts and Corresponding Danger (16 items) and Negative Beliefs Involving Superstition, Punishment, and Responsibility (13 items). Cronbach's alpha was good to excellent for both subscales in the present sample ($\alpha = .91$ and $.82$, respectively).

The PANAS assesses negative affect (10 items) and positive affect (10 items), which have been found to represent independent dimensions of emotional experience (Watson et al., 1988). The PANAS was administered with trait instructions (i.e., "Please indicate to what extent you experience each emotion in general or on the average") prior to the experiment to measure participants' typical emotional experience. Participants were asked to respond to each item on a Likert scale from 1 (*very slightly or not at all*) to 5 (*extremely*). Cronbach's alpha for both scales was good ($\alpha = .85$).

Participants were asked to provide information about one recently experienced obsessional, worried, and ruminative thought using items from the general descriptors subscale of the Cognitive Intrusions Questionnaire (CIQ; Freeston et al., 1992). The CIQ general descriptors subscale assesses the content and characteristics of intrusive or repetitive negative thoughts including frequency, duration, triggers, form (e.g., image, idea), and persistence. Participants were asked to describe the content of the thought in one to two sentences. All other items were rated on a 1-9 Likert scale.

In order to ensure that all participants endorsed at least some bothersome thoughts (so that the manipulation was believable), a series of very commonly reported thoughts of this type were added to the CIQ (e.g., “When on a high ledge, I have had the thought of jumping;” “On occasions, I have had doubts about my ability to succeed in life”). These items preceded the items related to self-nominated thoughts. Participants were asked to respond on a Likert scale ranging from 1 (*not at all true*) to 9 (*extremely true*). Items for this scale were taken from existing measures of social desirability (Crowne & Marlowe, 1960) and were reviewed by a small group of individuals with expertise in this area who assessed the relevance of these items and suggested other items for inclusion.

Outcome measures. Following the experimental manipulation, participants completed two measures for each of the three thought types. The first measure was the CIQ Avoidance Strategies Subscale. Previous studies using the CIQ have typically taken an item-by-item or factor analytic approach to describing avoidance strategies used with obsessional, worried, and ruminative thoughts in unselected samples (Langlois et al., 2000a, b; Watkins et al., 2005). Factor analyses have yielded two- or five-factor solutions for avoidance strategies used in response to the three thought types (Langlois et al.,

2000b; Watkins et al., 2005). However, the factors generated by these analyses have been difficult to interpret from a theoretical perspective. For parsimony, and because we were looking to test specific hypotheses about the impact of appraisals on urge to avoid, we instead chose to construct a theoretically meaningful and face valid avoidance strategies subscale. Selection of the conceptually and psychometrically strongest items (i.e., those with high face validity and highest item-total correlations) resulted in a 19-item scale (see Appendix A). Participants were asked to use a Likert scale ranging from 1 (*never*) to 9 (*always*) to indicate how much they would engage in each behavior if the same thought were to occur again. Items were averaged to create a mean score ranging from 1-9. Cronbach's alpha was good to excellent for each of the three thought types ($\alpha = .84 - .89$).

Participants were also asked to complete the PANAS (Watson et al., 1988) with state instructions (i.e., "Please indicate to what extent you feel this way right now") for each thought type to capture immediate fluctuations in affect evoked by the manipulation. The response scale was identical to the earlier PANAS. Cronbach's alpha for the negative and positive affect scales was good to excellent for each of the three thought types ($\alpha = .88 - .93$). Items were averaged to create a mean score ranging from 1-5.

Procedure

Participants were recruited from the Psychology Department's Research Participation Web site. All study procedures took place in a single laboratory session run by a female experimenter. Immediately prior to the experiment, participants were randomly assigned to receive feedback that the thoughts they reported on the CIQ descriptors subscale were more severe than those of their peers (Negative Feedback; $n =$

34) or completely average relative to their peers (Normalizing Feedback; $n = 32$), or to receive no feedback about their thoughts (No Feedback; $n = 32$).

After providing informed consent, participants were seated at a laptop computer. All questionnaires were administered electronically using Qualtrics Survey Software with “stop” screens built in to alert the participant when it was time to receive further instruction from the experimenter. Participants began the experiment by completing the MCQ and the PANAS, followed by the social desirability items. They were then presented with definitions and examples of obsessional, worried, and ruminative thoughts that are commonly reported by college students and have been used in previous research studies with this population (e.g., McLaughlin, Borkovec, & Sibrava, 2007; Teachman et al., 2006; see Appendix B). Definitions appeared on the computer screen and were read out loud by the experimenter. Participants provided one recently experienced thought of each type, completing the CIQ descriptors subscale for each thought. After completing the CIQ descriptors subscale, participants were asked to wait while the experimenter returned to the lab, ostensibly to download and score the questionnaires to determine their eligibility to continue in the study.

The Negative Feedback group received the following feedback about their thoughts: *You’re reporting more severe thoughts than we typically see on these questionnaires. What the scoring program has done is to create a standardized composite score of the thoughts you’ve reported based on the rarity of the thought content combined with the thought frequency and controllability. This creates a normal distribution where the mean standardized score is 50. You’re scoring in the 89th percentile, meaning that overall, the thoughts you reported are more rare in content, more frequent, and more*

uncontrollable than 89% of college students based on norms from previous studies. I checked with the lab manager about whether these thoughts were too severe to continue and she thinks it will be fine for us to go on, so I'm going to have you fill out some additional questionnaires about these thoughts.

The Normalizing Feedback group received the following feedback about their thoughts: *You're reporting average thoughts, which are similar to what we typically see on these questionnaires. What the scoring program has done is to create a standardized composite score of the thoughts you've reported based on the rarity of the thought content combined with the thought frequency and controllability. This creates a normal distribution where the mean standardized score is 50. You're scoring in the 51st percentile, meaning that overall, the thoughts you reported are average in rarity of content, frequency, and uncontrollability compared to college student norms. Our lab manager confirmed that it will be fine for us to continue with the experiment, so I'm going to have you fill out some additional questionnaires about these thoughts.*

Finally, the No Feedback group received the following information: *We're asking students to report thoughts in order to help us develop norms for these questionnaires. What the scoring program will do is to create a standardized composite score of the thoughts based on the rarity of the thought content combined with the thought frequency and controllability. This will create a normal distribution where the mean standardized score is 50. Your answers will help us to create the college student norms for these thoughts. Our lab manager confirmed that it will be fine for us to continue with the experiment, so I'm going to have you fill out some additional questionnaires about these thoughts.*

To enhance believability, feedback in the Negative Feedback and Normalizing Feedback conditions was accompanied by a printed score sheet that showed the participant's score for each individual thought, along with a standardized composite score for the three thoughts displayed on a normal distribution curve. Participants in the No Feedback condition were shown a blank score sheet to demonstrate what the scoring program would do once developed.

Immediately after the manipulation, participants completed the CIQ Avoidance Strategies Subscale and the PANAS three times, once for each thought. After completing all experimental measures, participants were asked whether they believed that the feedback they had received about their thoughts was true and accurate. Their affirmative or negative response was recorded to serve as a manipulation check. Participants were then debriefed and desensitized. Before leaving the lab, participants in all groups were told about the false feedback and given a chance to ask questions and discuss concerns. All participants expressed understanding and no participant expressed distress or concern about experimental procedures.

Results

Preliminary Analyses

All variables met the statistical assumption of normality, with the exception of positive affect, which was significantly positively skewed for all thought types and was transformed to normality using an inverse transformation (Tabachnick & Fidell, 2007) prior to analysis.

Accuracy of thought classification. Before testing study hypotheses, the content of each obsessive, worried, and ruminative thought reported by participants was

examined by both the first author and an independent rater to ensure that each thought was appropriately categorized based on the definitions provided to participants. Interrater reliability was good to excellent for each thought type ($\kappa = .79, .98, \text{ and } .90$ for obsessional, worried, and ruminative thoughts, respectively). Disagreements between raters were discussed until a consensus was reached, and thoughts were excluded from analyses if they were determined to be a poor fit for the thought definitions. This process resulted in a final sample of 97 obsessional thoughts, 98 worried thoughts, and 98 ruminative thoughts.

Believability of feedback manipulation. The majority of participants in all three groups believed the feedback they received about their thoughts. The proportion of participants who reported believing the manipulation did not differ by group, with 82% of participants (28/34) in the Negative Feedback group reporting that they had believed the feedback, compared to 91% in the Normalizing Feedback group (29/32) and 97% (31/32) in the No Feedback group, $\chi^2(2, N = 98) = 4.54, p = .104$.

Success of random assignment and evaluation of order effects. We tested for differences between groups (Negative, Normalizing, and No Feedback) prior to the manipulation to check the success of random assignment and found no significant differences between the three groups in preexisting beliefs about thoughts (MCQ) or trait negative affect (PANAS), all $F(2, 95) < 0.26$, all $p > .775$. However, the three groups did differ in trait positive affect assessed prior to the manipulation, with the No Feedback group reporting lower levels of positive affect than both the Negative Feedback and Normalizing Feedback groups, $F(2, 95) = 3.19, p = .045$. To ensure that study findings

were not influenced by this preexisting difference, all analyses reported below were completed controlling for trait positive affect.

No differences were found between the three thought orders on any of the outcome variables (negative affect, urge to avoid, or positive affect), all $F(2, 95) < 1.91$, all $p > .155$. We also tested for an interaction between thought order and experimental condition in predicting all outcome variables to ensure that the effects of thought order on outcomes did not differ systematically by experimental condition and found no significant interaction between thought order and condition in predicting any outcome, all $F(4, 190) < 1.99$, all $p > .104$.

Effects of Appraisal Manipulation on Outcomes Across Thought Types

We began by testing our hypothesis that across all three thought types the Negative Feedback group would experience greater negative affect, greater urge to avoid, and less positive affect relative to the other two groups, while the Normalizing Feedback group would experience the opposite pattern. These hypotheses were tested separately for each outcome using a series of 3x3 mixed model analyses of variance (ANOVAs) with thought type (obsessional versus worried versus ruminative) as the within-subjects factor and experimental condition (Negative versus Normalizing versus No Feedback) as the between-subjects factor. Descriptive statistics for each outcome by thought type and condition are presented in Table 1.

Overall, the effects of the appraisal manipulation were unexpected and did not support theoretical claims. Contrary to hypotheses, the Negative Feedback group did not report more negative outcomes than the Normalizing Feedback or No Feedback groups. Negative and positive affect differed significantly between the three groups following the

manipulation, both $F(2, 95) > 3.19$, both $p < .047$. However, pairwise comparisons revealed that the effect of the manipulation on both outcomes was in the opposite direction from what was expected, with individuals in the No Feedback condition reporting higher levels of negative affect and individuals in the Normalizing Feedback condition reporting lower levels of positive affect compared to individuals in the other two conditions. Further, the effect on positive affect was qualified by an unexpected significant interaction between thought type and experimental condition, $F(4, 190) = 2.66$, $p = .035$. Across all three thought types, post-manipulation positive affect was highest in the Negative Feedback group, lower in the No Feedback group, and lowest in the Normalizing Feedback group. The difference in positive affect between the Negative Feedback group and the Normalizing Feedback group was statistically significant for worry and rumination, both $F(2, 64) > 2.72$, both $p < .039$, but not for obsessions, $F(2, 64) = 0.78$, $p = .685$. Finally, differences between the three groups in urge to avoid also approached significance, $F(2, 95) = 2.41$, $p = .098$, but were again in an unexpected direction, with individuals in the Normalizing Feedback condition reporting greater urge to avoid than individuals in the Negative Feedback condition.¹

As expected, we found differences between the three thought types in levels of negative outcomes. In particular, the three thought types differed in levels of positive affect and urge to avoid following the manipulation, such that levels of positive affect were lower for obsessional and ruminative thoughts than for worried thoughts and urge to avoid was the strongest for ruminative thoughts, followed by worried thoughts, and finally by obsessional thoughts, both $F(2, 190) > 6.42$, both $p < .002$. There were no

significant differences between the thought types in level of negative affect following the manipulation, $F(2, 190) = .50, p = .605$.

Interaction of Experimental Condition with Preexisting Negative Beliefs

Across all three thought types, we hypothesized that individuals' preexisting negative beliefs about thoughts (measured by the MCQ) would interact with experimentally induced appraisals in predicting outcomes, such that higher levels of preexisting negative beliefs would predict greater negative outcomes among those randomly assigned to the Negative Feedback condition, but not those assigned to the Normalizing Feedback or No Feedback conditions. This hypothesis was tested using hierarchical regression.

Because the two negative beliefs subscales of the MCQ (Negative Beliefs about the Controllability of Thoughts and Corresponding Danger; Negative Beliefs Involving Superstition, Punishment, and Responsibility) were conceptually related and highly correlated ($r = .58$), they were standardized and combined into a single preexisting negative beliefs composite for analysis. We ran analyses separately by thought type for each outcome (i.e., negative affect, urge to avoid, and positive affect) in order to achieve a true transdiagnostic test of our hypotheses. This resulted in a total of nine regression analyses.

Regression analyses were conducted according to guidelines outlined by Aikin and West (1991). Prior to analysis, the continuous predictor variable (preexisting negative beliefs) was standardized. Experimental condition was represented by two dummy-coded variables, with the Negative Feedback group serving as the reference group. Two interaction terms were created by multiplying preexisting negative beliefs by

each of the two dummy-coded variables (Negative Feedback versus Normalizing Feedback and Negative Feedback versus No Feedback). In all analyses, the preexisting negative beliefs composite was entered on the first step to test for a main effect of beliefs in predicting outcomes. The two dummy-coded variables representing experimental condition, along with the two interaction terms, were entered on the second step to test for differences in the effect of preexisting beliefs as a function of experimental condition.

When entered on the first step, preexisting negative beliefs accounted for a significant proportion of the variance in negative affect (see Table 2) across all three thought types (7%-15%) and in avoidance strategies (see Table 3) for obsessions (10%) and worry (7%). For all thought types, individuals reporting higher levels of preexisting negative beliefs reported greater negative affect and urge to avoid following the experimental manipulation, irrespective of experimental condition. Preexisting negative beliefs were not a significant predictor of positive affect for any thought type (see Table 4).

When the interaction between preexisting negative beliefs and experimental condition was entered on the second step, it accounted for an additional 6% to 13% of the variance in negative affect across thought types. The pattern of results was the same across the three thought types and showed that the relationship between preexisting negative beliefs and negative affect following the manipulation differed for individuals in the Negative Feedback compared to the Normalizing Feedback condition, but not compared to the No Feedback condition (see Figure 1). To further examine the nature of this interaction, simple slopes were computed for the relationship between preexisting negative beliefs and negative affect among individuals in the Negative Feedback and

Normalizing Feedback conditions. For all three thought types, the simple slope for individuals randomly assigned to the Negative Feedback condition was significant, all $t(32) > 3.35$, all $p < .003$, showing that higher levels of preexisting negative beliefs were associated with greater negative affect. In contrast, the simple slope for individuals randomly assigned to the Normalizing Feedback condition was not significant for any thought type, all $t(30) < 1.06$, all $p < .303$, showing that preexisting negative beliefs were not associated with greater negative affect. The interaction between preexisting negative beliefs and experimental condition did not account for any additional variance in avoidance strategies or in positive affect.

Discussion

The present study experimentally manipulated appraisals of normal obsessional, worried, and ruminative thoughts by providing healthy participants with either negative, normalizing, or no feedback about the severity of these thoughts. We tested whether negative feedback led to increased negative outcomes relative to normalizing feedback and no feedback and whether individuals' preexisting beliefs about their thoughts interacted with experimentally induced appraisals of thoughts in predicting outcomes. Surprisingly, we found that the experimental manipulation seemed to have the expected effect on outcomes only for those individuals who came into the study with preexisting negative beliefs about thoughts.

We had hypothesized that the receipt of negative feedback about the severity of thoughts would increase negative outcomes, while the receipt of normalizing feedback would decrease negative outcomes. The main effect of experimental condition on outcomes was therefore quite unexpected, but was qualified by the finding of a

significant and clinically meaningful effect of preexisting beliefs in predicting outcomes, both alone and in interaction with experimental condition. Across all three thought types, preexisting negative beliefs about thoughts accounted for a large proportion of the variance in outcomes, irrespective of experimental condition, with greater negative beliefs about thoughts predicting greater negative affect and urge to avoid. Preexisting negative beliefs further interacted with experimentally induced appraisals in predicting negative affect. In the Negative Feedback condition, the receipt of feedback about the severity, rarity, and uncontrollability of their thoughts relative to their peers triggered negative emotional experience among individuals who came into the study with the belief that thoughts are uncontrollable, dangerous, or harmful. In contrast, individuals who came into the study with less negative beliefs about their thoughts were less bothered by this feedback. As expected, a different pattern emerged in the Normalizing Feedback condition, such that the receipt of feedback that their thoughts were normal did not predict emotional experience, regardless of individuals' preexisting negative beliefs.

These findings build upon Teachman and colleagues' (2006, 2007) recent studies by showing that the interaction between experimentally induced appraisals and preexisting beliefs about thoughts predicts explicitly reported outcomes (i.e., negative affect) in addition to those that are measured implicitly. Further, the present findings show that this effect applies to worry and rumination, as well as to obsessions. With the exception of the main effect of preexisting negative beliefs on avoidance strategies, which reached significance for obsessions and worries, but not for rumination, findings in the present study were remarkably consistent across all three thought types. The present findings therefore suggest that the process by which negative beliefs and appraisals lead

to outcomes may be similar across these distinct thought types, providing support for a transdiagnostic model of the pathway from normal intrusive or repetitive negative thoughts to outcomes.

Despite the theoretically meaningful interaction between preexisting beliefs and appraisal feedback, findings regarding the main effect of experimental condition remain difficult to interpret due to their inconsistency with theory and with prior experimental investigations of appraisals of obsessional thoughts. Several methodological differences between previous research and the present study may help to explain discrepant findings. First, the negative feedback used in the present study differed from previous research in several important ways. Previous studies have tended to either induce negative appraisals through a generic laboratory task (Rassin et al., 1999) or to provide feedback about thoughts in general and ask participants to quietly reflect on how the information relates to their own thoughts (Teachman et al., 2006; Teachman & Clerkin, 2007). The negative feedback in the present study was therefore much more personal and individualized compared to previous studies. We had hoped that this would make the feedback more powerful, but it is possible that greater customization may have instead resulted in reactance or strategic responding, with participants in the Negative Feedback group answering questions in an effort to show that they were in fact not bothered by these thoughts (Teachman et al., 2006). However, data collected during pilot testing and on the debriefing questionnaire argue against this explanation. A large minority of participants (43%) in the Negative Feedback condition reported that they were not at all surprised by the feedback because they expected that their thoughts would be more severe than average. Even participants who reported that they were initially surprised by the

feedback tended to report that it caused them to think back about their experiences and to realize that they may be experiencing more severe thoughts than they had realized. Only a very small number of individuals reported complete disbelief about the accuracy of the manipulation, and results from sensitivity analyses show that excluding this subset did not change the overall pattern of results.

Another important way in which the negative feedback in the present study differed from previous studies is in the specific content of the appraisals that were induced (i.e., rarity, frequency, and uncontrollability of thoughts, relative to peers). Teachman and colleagues successfully (according to their manipulation check) induced appraisals that thoughts are significant, meaningful, and indicative of an individual's personal values (2006) or individual character (2007), but found no main effect of the manipulation on implicit (e.g., evaluation of the self as immoral or dangerous) or explicit (e.g., state self-esteem, negative affect) outcome measures compared to control groups receiving no instruction or instruction that these thoughts were meaningless. In contrast, Rassin and colleagues (1999) found that a manipulation to increase thought-action fusion (which included responsibility and morality) led to more intrusive thoughts, discomfort, anger, and efforts to resist thoughts compared to a control group. Consistent with Rassin's (1999) findings, several earlier studies found that induction of responsibility appraisals led to increased anxiety, discomfort, and checking behavior among healthy participants (Ladouceur et al., 1995) and patients with OCD (Lopatka & Rachman, 1995; Shafran, 1997). Taken together, discrepant findings across this literature raise the possibility that the specific subject matter of appraisals may have an effect on outcomes,

with responsibility appraisals showing a larger or more consistent effect than appraisals of severity or personal significance.

The Normalizing and No Feedback conditions in the present study also differed in important ways from previous research. In contrast to the very brief normalizing feedback administered in the present study, the intervention used by Zucker and colleagues (2006) was a three-hour manualized group workshop that included psychoeducation to normalize the occurrence of intrusive thoughts as well as exercises to demonstrate the effects of avoidance and thought suppression, exposure and response prevention exercises, and cognitive restructuring. In addition to being substantially longer and consequently more potent, this intervention was administered to students experiencing subclinical OCD symptoms, who may have had more room for change than the unselected sample used in the present study.

Further, our No Feedback condition was intended to control for the effects of testing (including the recollection of intrusive or repetitive negative thoughts) and the receipt of information about a scoring program designed to evaluate thoughts. Participants in this condition were asked to recall negative thoughts, but were told that we were simply interested in studying students' experiences and did not yet have any way of evaluating these thoughts. In contrast to the negatively-valenced Negative Feedback condition and the neutral- to positively-valenced Normalizing Feedback condition, the No Feedback condition was expected to be strictly neutral. However, state positive affect across all three conditions, including the No Feedback condition, was extremely low following the manipulation, in comparison to norms for college students (Watson et al., 1988) and to the trait positive affect reported by participants before beginning the present

study. This pattern is consistent with that seen following a general laboratory stressor (Ruscio, Seitchik, Gentes, Jones, & Hallion, 2011). Although we did not mean for the manipulation to be experienced as a general stressor, it appears that all three groups may have experienced it as such. Most participants reported at debriefing that they were not concerned about the experimenter seeing their thoughts, but participants in all three conditions may have experienced embarrassment, shame, or other negative emotions as a result of being asked to share and receive feedback about these very personal experiences. In fact, results suggest that the No Feedback condition produced more negative affect even than the Negative Feedback manipulation, in which participants were told that their thoughts were so severe that the experimenter was unsure if they could continue participating in the study. These results strongly suggest that the No Feedback condition was in fact not as neutral as intended. It may be that the uncertainty of being asked to report about very personal and often shameful thoughts and then receiving no feedback is in fact more stressful even than the receipt of clear negative feedback.

Findings from the present study must be interpreted in the context of several limitations. The manipulation used in the present study was carefully designed to be both powerful and ecologically valid. College students may receive accurate or inaccurate feedback about the normality of intrusive or repetitive thoughts in the course of their daily lives through conversation with peers or simply by comparing their own internal experiences to what they observe of their peers', with whom they often live in close proximity and spend a great deal of time, providing ample opportunity for comparison. Data from pilot testing and from our debriefing questionnaire show that participants

tended to believe that the feedback accurately represented their thoughts. However, a particular concern in the present study is that it is difficult to know exactly what was induced in each experimental condition. We chose not to include a manipulation check immediately following the manipulation because we were concerned that it might introduce additional demand characteristics or take up enough time that the effects of the manipulation would wear off before participants completed outcome measures. However, because we did not assess whether the manipulation influenced how participants thought about their thoughts we cannot be sure that our manipulation had the intended effect of inducing negative appraisals rather than other experiences (e.g., embarrassment). We used random assignment and a large sample, and it is encouraging that the groups did not differ in terms of how much they believed the manipulation, but future research should include a true manipulation check to ensure that appraisals of thoughts change in the expected direction.

An additional limitation was that participants' preconceived notions about the rarity, frequency, and uncontrollability of their thoughts were not assessed prior to the manipulation, nor were baseline measures of the outcome variables, because of concerns about assessment burden. Although random assignment of a sizable sample was expected to prevent systematic group differences on these factors, it may be useful for future studies to collect pretest data so that findings may be interpreted in terms of change due to the manipulation. Data collected prior to the manipulation may also provide a context for interpreting unexpected findings. For example, because we did not assess preconceived notions about the rarity, frequency, and uncontrollability of thoughts prior to the manipulation, it remains possible that many individuals began the experiment

believing that they alone experience these sorts of thoughts (i.e., in the 100th percentile) and that the Negative and Normalizing Feedback conditions actually both served to normalize the thoughts simply by informing participants that they are not entirely alone in this experience. Differences found between the Normalizing and Negative Feedback groups argue against this particular explanation, yet the large proportion of participants reporting a lack of surprise at falling in the 89th percentile for thought severity suggests that more participants than expected may have begun the experiment believing that their thoughts were extremely severe. Data on change from pre- to post-manipulation may have helped in ruling out (or in) this and other alternative explanations for the unanticipated results observed here.

Finally, although the assessment of multiple thought types enabled a more direct comparison of thought types and consequently served as a particularly powerful test of the transdiagnostic hypothesis, it also introduced a number of limitations. First, it added assessment burden, increasing the chances that participants became bored or fatigued during the course of the study. Further, although we did not find any evidence that thought order predicted outcomes, we did not use a full Latin square design so it remains possible that the effects of one thought type carried over to the thoughts that immediately followed. Future research should use designs that minimize carryover effects or use a fully between-subjects design in which each participant contributes only one thought. Finally, for the sake of feasibility, we provided each participant with a single manipulation and a single composite score representing all three thought types. To the extent that participants held very different views of the “normality” of their obsessional,

worried, and ruminative thoughts, the receipt of a single score for all three may have reduced the potency or believability of the manipulation.

Despite these limitations, the present findings may have a number of implications for the conceptualization and treatment of negative beliefs and appraisals across thought types. Findings across all three thought types are broadly consistent with cognitive-behavioral and metacognitive models, in that negative beliefs about thoughts predicted negative outcomes both alone and in interaction with the experimental feedback. However, we were not able, in the present study to show that negative appraisals of thoughts cause negative outcomes, as proposed by theoretical models. Rather, findings were consistent with a diathesis-stress model of psychopathology, which suggests that an individual's biological, social/developmental, or cognitive-behavioral vulnerability interacts with environmental events and stressors to trigger maladaptive behaviors or psychological disorders and that conversely, an individual who lacks this vulnerability would not experience anxiety or mood symptoms, even in the context of a stressor. In the present study, the individual's preexisting negative beliefs acted as the diathesis and predicted levels of negative outcomes in the face of a specific and relevant stressor (feedback that their thoughts were more severe than normal) but not under conditions in which the vulnerability was not activated (feedback that their thoughts were average). The fact that all three conditions in the present study appear to have been quite stressful for participants suggests that differences in the influence of preexisting beliefs between the Negative and Normalizing Feedback conditions may be attributed to the specific nature of the feedback received in the Negative condition and its relevance for individuals with preexisting negative beliefs.

Responses to the Negative Feedback condition suggest that preexisting negative beliefs may be readily activated and predict response to specific stressors even among healthy individuals (Teachman & Clerkin, 2007). These findings raise further questions about the nature of these preexisting beliefs, including where they come from, who is at risk of developing them, and what determines whether someone who holds these beliefs remains below the diagnostic threshold or goes on to develop clinically significant anxiety or mood symptoms.

The present study also raises questions about how negative beliefs might be addressed to reduce vulnerability for psychopathology. Although the normalizing feedback was not the focus of the present study, findings from that condition show no influence of preexisting negative beliefs on negative affect, providing preliminary support for the utility of brief psychoeducational interventions to prevent symptom development among individuals whose negative beliefs about thoughts make them vulnerable to anxiety or mood symptoms (e.g., Zucker et al., 2006). Further, this study provides evidence that a process previously studied only with respect to obsessional thoughts may in fact operate similarly across worried and ruminative thoughts. Although findings will need to be replicated in future research to overcome some of the limitations of the present study, they provide support for transdiagnostic models of the process leading from intrusive or repetitive negative thoughts to negative outcomes, and importantly, for transdiagnostic interventions aimed at modifying this process across distinct thought types (Harvey et al., 2004).

Footnote

¹ Sensitivity analyses were performed by repeating the analyses with only those individuals who reported that they had believed the manipulation. The pattern of results from these analyses was identical to the pattern reported for the full sample, with two exceptions. First, the main effect of experimental condition on urge to avoid was nonsignificant, $F(2, 87) = 1.22, p = .301$. Second, the interaction between experimental condition and thought type on positive affect was reduced to a trend level, $F(4, 174) = 2.29, p = .063$.

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Table 1
Descriptive Statistics by Thought Type and Condition

Measure	Negative Feedback (<i>n</i> = 34)	Normalizing Feedback (<i>n</i> = 32)	No Feedback (<i>n</i> = 32)
Obsession			
Negative Affect	1.76 (.76)	1.76 (.62)	2.14 (.73)
Positive Affect	2.01 (1.03)	1.72 (.59)	1.94 (.81)
Avoidance	3.82 (1.50)	4.38 (1.48)	4.26 (1.28)
Worry			
Negative Affect	1.76 (.78)	1.74 (.61)	2.26 (.66)
Positive Affect	2.54 (.88)	1.83 (.89)	2.08 (.78)
Avoidance	4.22 (1.05)	4.70 (1.41)	4.70 (1.23)
Rumination			
Negative Affect	1.84 (.77)	1.89 (.68)	2.06 (.81)
Positive Affect	2.33 (.99)	1.80 (.70)	1.87 (.72)
Avoidance	4.39 (1.21)	5.08 (1.37)	4.76 (1.47)

Note. Values represent *M* (*SD*).

Table 2

Results from Hierarchical Regression Predicting Negative Affect

	Obsession					Worry					Rumination				
	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2
Step 1				.12	.12**				.15	.15**				.07	.07*
Preexisting beliefs	.40	.13	.35**			.44	.13	.38**			.30	.13	.26*		
Step 2				.29	.16**				.32	.17**				.22	.15*
Condition (NEG v. NORM)	.06	.26	.03			-.02	.26	-.01			-.01	.27	-.01		
Condition (NEG v. NO)	.56	.25	.26			.70	.25	.32**			.32	.26	.15		
Preexisting beliefs * Condition															
(NEG v. NORM)	-.91	.31	-.41**			-.76	.31	-.34*			-1.07	.33	-.48**		
Preexisting beliefs * Condition															
(NEG v. NO)	-.20	.28	-.11			-.36	.28	-.20			-.44	.28	-.27		

Note. $N = 98$. NEG = Negative Feedback; NORM = Normalizing Feedback; NO = No Feedback. Separate hierarchical regression analyses were conducted for each thought type. Condition was included in the model as a set of dummy codes contrasting Negative Feedback (0) with Normalizing Feedback (1) and No Feedback (1) conditions.

* $p < .05$. ** $p < .01$

Table 3

Results from Hierarchical Regression Predicting Urge to Avoid

	Obsession					Worry					Rumination				
	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2
Step 1				.10	.10**				.07	.07*				.02	.02
Preexisting beliefs	.36	.13	.32**			.30	.13	.27*			.15	.12	.14		
Step 2				.17	.07				.15	.08				.11	.09
Condition (NEG v. NORM)	.48	.27	.22			.46	.29	.21			.54	.26	.27*		
Condition (NEG v. NO)	.23	.27	.11			.31	.27	.15			.17	.25	.09		
Preexisting beliefs * Condition															
(NEG v. NORM)	-.28	.33	-.13			-.28	.34	-.13			-.25	.31	-.12		
Preexisting beliefs * Condition															
(NEG v. NO)	-.45	.30	-.25			-.53	.31	-.31			-.44	.28	-.27		

Note. $N = 98$. NEG = Negative Feedback; NORM = Normalizing Feedback; NO = No Feedback. Separate hierarchical regression analyses were conducted for each thought type. Condition was included in the model as a set of dummy codes contrasting Negative Feedback (0) with Normalizing Feedback (1) and No Feedback (1) conditions.

* $p < .05$. ** $p < .01$

Table 4

Results from Hierarchical Regression Predicting Positive Affect

	Obsession					Worry					Rumination				
	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2	<i>B</i>	<i>SE</i>	β	R^2	ΔR^2
Step 1				.00	.00				.01	.01				.04	.04
Preexisting beliefs	.00	.13	.00			-.10	.13	-.09			-.21	.13	-.19		
Step 2				.03	.03				.11	.10				.16	.13
Condition (NEG v. NORM)	-.28	.29	-.13			-.63	.28	-.31*			-.48	.27	-.23		
Condition (NEG v. NO)	-.12	.28	-.06			-.40	.27	-.20			-.47	.26	-.23		
Preexisting beliefs* Condition															
(NEG v. NORM)	.33	.35	.15			.31	.34	.15			.71	.34	.33		
Preexisting beliefs * Condition															
(NEG v. NO)	.27	.32	.16			.33	.31	.20			.53	.30	.31		

Note. $N = 98$. NEG = Negative Feedback; NORM = Normalizing Feedback; NO = No Feedback. Separate hierarchical regression analyses were conducted for each thought type. Condition was included in the model as a set of dummy codes contrasting Negative Feedback (0) with Normalizing Feedback (1) and No Feedback (1) conditions.

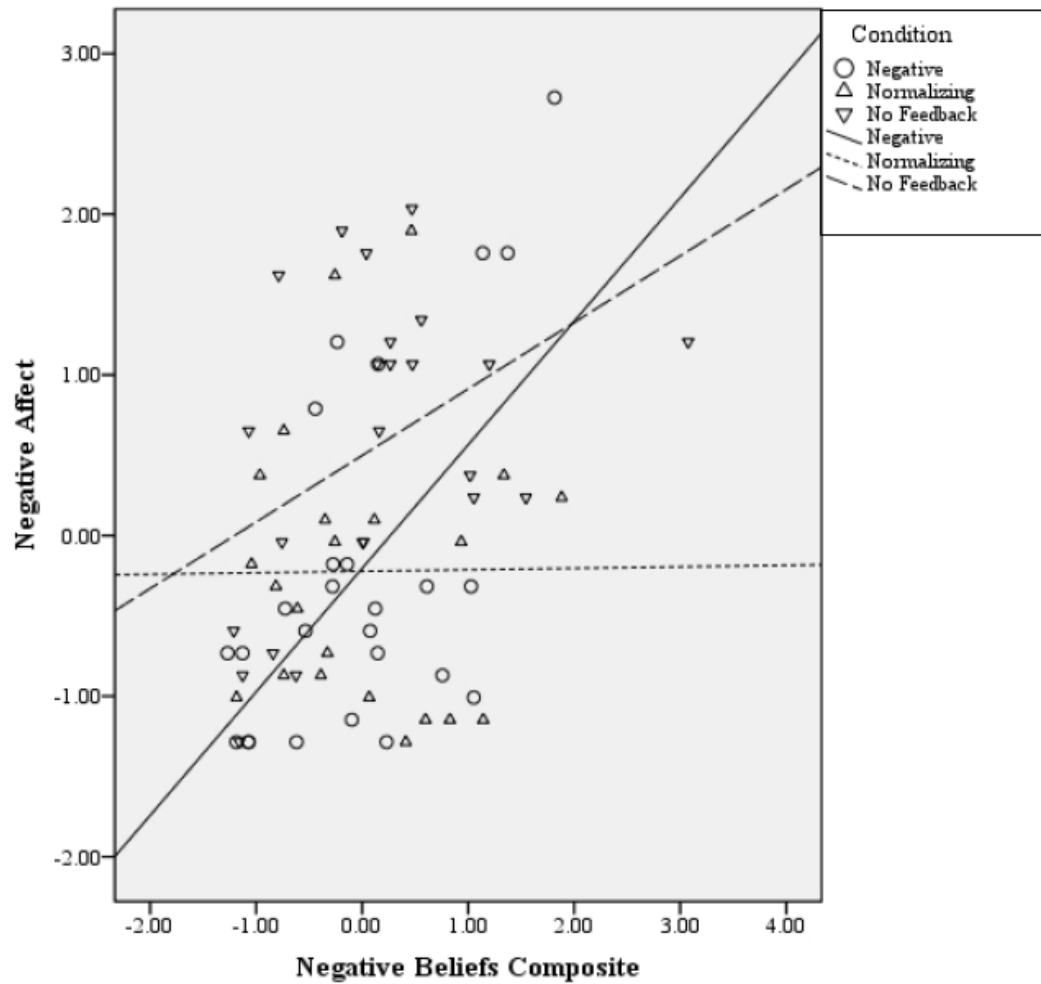


Figure 1. Results from hierarchical linear regression showing interaction between preexisting negative beliefs about thoughts and feedback condition (Negative versus Normalizing) in predicting negative affect following the manipulation. Results shown are for worried thoughts, which are representative of the pattern seen for all three thought types. Negative beliefs and negative affect are represented by standardized scores. Within the Normalizing Feedback condition, preexisting negative beliefs were not a significant predictor of negative affect following the manipulation for any thought type. However, within the Negative Feedback condition, higher levels of preexisting negative beliefs predicted higher negative affect following the manipulation across all thought types. The Negative and No Feedback conditions did not differ significantly from one another.

*Chapter 3 Appendix A***Cognitive Intrusions Questionnaire Avoidance Strategies Subscale**

People do many different things when this type of thought gets into their mind. Imagine that this thought occurs again next week. Rate how much you would use each of the following approaches.

1. I would distract myself with things around me
2. I would do things that need concentration
3. I would replace the thought by another more pleasant thought
4. I would tell myself “stop”
5. I would reassure myself by speaking to somebody
6. I would reprimand myself
7. I would tell myself it means nothing
8. I would neutralize it by a mental or physical action
9. I would replace the thought by another unpleasant thought or minor problem
10. I would analyze the situation or problem described by the thought
11. I would try to find a solution
12. I would dwell on the causes and the implications of the situation described by the thought – why it happened or why it might happen
13. I would focus on the details of the situation described by the thought – how it happened or how it might happen
14. I would evaluate what the thought and the situation described by the thought mean about me
15. I would think about what I can learn from the situation described in the thought
16. I would dwell on positive aspects of myself
17. I would dwell on negative aspects of myself
18. I would plan how I can avoid the situation described by the thought
19. I would dwell on the consequences of the situation described by the thought

Chapter 3 Appendix B

Thought Definitions

(Obsession): A thought you didn't really want to have that popped into your head unexpectedly, and may be socially unacceptable or contrary to how you try to live your life. Some examples of thoughts of this type include:

1. Driving a car off the road or swerving into traffic
2. Insulting strangers or family
3. That you might have left the stove on
4. That you might have left your home unlocked
5. Sex in public or with an unacceptable person
6. Catching an STD or other disease or illness

(Worry): A thought about a potential negative future event or catastrophe. Some examples of thoughts of this type include:

1. That I may never achieve my goals or ambitions
2. That I may not keep up with my work
3. That I may not be able to afford things or pay my bills
4. That I may lose close friends or relationships

(Rumination): A thought about a negative mood or feeling that you are experiencing OR about a past problem or failure. Some examples of thoughts of this type include:

1. That I feel so down
2. That I don't have any energy
3. That I did poorly on an exam
4. That I think I hurt someone's feelings yesterday