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Delineating Characteristics of Maladaptive Repetitive Thought: Development and Preliminary Validation of the Perseverative Cognitions Questionnaire

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Abstract

Worry, rumination, and obsessive thinking are theorized to differ on temporal orientation, positive perceived function, degree of intrusiveness, and discordance with one's self-concept. However, prior findings with respect to such differences may be due to method variance of the measures used and/or inclusion of items confounded by diagnostic symptoms. Accurately capturing differences between types of perseverative thought linked to psychopathology and understanding whether such aspects are common across disorders or specific to some may be important to designing effective treatments for them. Two studies are presented detailing the development and validation of the *Perseverative Cognitions Questionnaire* (PCQ). The PCQ is a 45-item self-report measure that assesses six dimensional characteristics of worry, rumination, and obsessive thinking previously found to discriminate these thought styles: *Lack of Controllability, Preparing for the Future, Expecting the Worst, Searching for Causes/Meaning, Dwelling on the Past,* and *Thinking Discordant with Ideal Self.* Factor structure of the PCQ was established using principal components, exploratory factor, and confirmatory factor analyses. PCQ scales exhibited differential convergence with measures of perseverative thought and psychopathology. The PCQ also demonstrated acceptable retest correlations across 1- and 2-week periods, and incremental validity when predicting symptoms of anxiety, depression, and obsessive compulsive disorder.

Keywords

Perseverative Cognitions Questionnaire; worry; rumination; obsessive intrusions; repetitive negative thinking; transdiagnostic process; scale construction

Perseverative thought can increase negative emotions, disrupt cognitive functioning, and negatively influence health (Segerstrom et al., 2012; Watkins, 2008). It is a process implicated in the development and maintenance of various forms of psychopathology, predictive of maladaptive behavioral response outcomes (e.g., avoidance), and associated with poorer response to treatment (Ehring & Watkins, 2008; Ruscio, Seitchik, Gentes, Jones, & Hallion, 2011; Watkins, 2008).

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Several types of perseverative thinking, such as worry, rumination, and obsessions, have been associated with anxiety and depressive disorders as well as with obsessive compulsive disorder (OCD). Worry is generally defined as repetitive, uncontrollable thinking about feared future events (Borkovec, Ray, & Stober, 1998) and is the core cognitive process of generalized anxiety disorder (GAD). Conversely, rumination has been conceptualized as repetitive, aversive, and uncontrollable self-focused thought (Martin & Tesser, 1996), which centers on past negative experiences (Nolen-Hoeksema, 1991), involves negative appraisals about oneself, and is associated with depressed mood. Furthermore, obsessions are defined as persistent thoughts, images, or impulses that are experienced as intrusive and cause marked distress (American Psychiatric Association, 2013) and are a core symptom of OCD.

Although these repetitive thought constructs have emerged from distinct areas of research, there is notable overlap between their theoretical conceptualizations. Such similarity has led to debate about whether worry, rumination, and obsessive thinking are similar constructs commonly associated with different disorders, the same cognitive process depicting varying degrees of intensity, or different phenomena altogether. This debate has inspired two major lines of inquiry exploring related and unique features of these forms of perseverative thought in order to better understand these constructs.

The transdiagnostic model of perseverative thought (Ehring & Watkins, 2008) epitomizes one approach, emphasizing commonalities between types of repetitive negative thinking (RNT). This model conceptualizes RNT as being difficult to disengage from and unproductive. Two measures of RNT have followed from this model. The *Repetitive Thinking Questionnaire* (RTQ; McEvoy, Mahoney, & Moulds, 2010) is a transdiagnostic measure of repetitive thoughts or images. Although the RTQ first combined items from the *Penn State Worry Questionnaire* (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990), the *Ruminative Response Scale* (RRS; Nolen-Hoeksema & Morrow, 1991), and the *Post-Event Processing Questionnaire–Revised* (McEvoy & Kingsep, 2006), the authors then adapted these items to remove non-transdiagnostic content. The goal of the RTQ was to capture a common repetitive thinking factor. Similarly, the *Perseverative Thinking Questionnaire* (PTQ; Ehring et al., 2011) was also an effort to identify unifying features of perseverative thinking. Similar to the RTQ, the PTQ tried to remove non-transdiagnostic aspects such as temporal orientation.

Distinct Features of Worry, Rumination, and Obsessive Thinking

Contrary to prior measures, in the current study, the *Perseverative Cognitions Questionnaire* (PCQ) was developed to address the second line of inquiry with the goal of capturing potential distinguishing features of worry, rumination, and obsessive thinking that have emerged from prior theory and research. Such differences are theorized to fall along four key dimensions: (1) temporal orientation: (a) *Expecting the Worst* (EW) *versus* (b) *Dwelling on the Past* (DP); (2) perceived function: (a) *Searching for Causes/Meaning* (SC) *versus* (b) *Preparing for the Future* (PF); (3) degree of intrusiveness and controllability: *Lack of Controllability* (LC); and (4) dissonance with one's self-concept: *Thinking Discordant with Ideal Self* (DT).

With respect to temporal orientation, whereas chronic worriers catastrophize about potential future threats (Borkovec & Roemer, 1995; Newman & Llera, 2011), ruminative thinking is characterized by distorted interpretations of past negative events (Nolen-Hoeksema, 1991). In fact, temporal orientation has emerged as one of the most reliable differences between rumination and worry (Papageorgiou & Wells, 1999a, 2004; Watkins, Moulds, & Mackintosh, 2005). Rumination has similarly been found to be more past focused than obsessive thinking (Wahl et al., 2011).

Worry, obsessions, and rumination are also theorized to serve differential perceived functions (Watkins, 2004). On the one hand, worry is viewed as a form of anticipatory problem solving (Davey, Hampton, Farrell, & Davidson, 1992), such that it enables people to prepare for or evade potential negative events (Borkovec & Roemer, 1995; Newman & Llera, 2011). Likewise, obsessions and related compulsions are attempts to prevent negative outcomes and obsessions may be associated with overvalued ideation (Clark & O'Connor, 2005). Alternatively, rumination is related to a greater need to understand a situation (Watkins, 2004).

Although people attribute positive functions to worry, obsessions, and rumination (e.g., avoiding catastrophe, understanding), such thought types may also involve differential degrees of intrusion and controllability (Rachman, 1985; Turner, Beidel, & Stanley, 1992). For example, in terms of controllability, naturally occurring worry was reported as more voluntary and longer in duration, than naturally occurring obsessions (Wells & Morrison, 1994). However, worrisome thoughts were associated with less controllability than depressive thoughts (Papageorgiou & Wells, 1999b). At the same time, worry and rumination were described as ego-syntonic, or consistent with how individuals view themselves, whereas obsessive thinking was often referred to as ego-dystonic or discordant with one's self-image, likely due to abhorrent content (Langlois, Freeston, & Ladouceur, 2000; Turner et al., 1992). All in all, the aforementioned points of potential distinction, including temporal orientation, positive perceived function, controllability, and ego-dystonia, were targeted in the development of the PCQ.

Measurement Concerns

Previous research on distinguishing features of perseverative thinking have used questionnaires developed to separately assess diagnosis-specific cognitive styles. However, there are confounds with using such measures in tandem to determine whether these constructs differ. These include the following: (1) differences found may be due to method variance; (2) similarities found could be due to overlapping items; (3) instruments often refer to these constructs directly and assume that most people can differentiate them by label; and (4) differential associations between thought constructs and specific disorders (e.g., rumination more likely to occur in depression) may be due to items that are confounded with diagnostic symptoms of those disorders as opposed to true differential associations. We elaborate on these points below.

One problematic issue is using nonequivalent measures as proxies for different thought styles. Each instrument targets different facets of each construct. For example, the PSWQ

(Meyer et al., 1990) focuses on the excessiveness, pervasiveness, and uncontrollability of pathological worry. However, the RRS (Nolen-Hoeksema & Morrow, 1991) targets thoughts related to understanding causes and consequences of depression. At the same time, OCD measures such as the *Padua Inventory* (PI; Sanavio, 1988) focus on thought content (e.g., worry about having hurt somebody) and specific behaviors (e.g., reassurance seeking). Also, measures are rated on different scales (e.g., RRS on 4-point scale based on frequency, PSWQ on 5-point scale based on how characteristic the item is). Thus, any differences found between these measures could be due to method variance as opposed to true differences between the constructs they are meant to represent.

Another method problem is item overlap. The PI (Sanavio, 1988) references both worry and obsessions (e.g., When doubts and worries come to my mind, I cannot rest until I have talked them over with a reassuring person; Wells & Papageorgiou, 1998). Although these problematic items were addressed in a subsequent revision (Burns, Keortge, Formea, & Sternberger, 1996), items were retained that could pertain to either worry or obsessions (e.g., I think or worry at length about having hurt someone without knowing it). Whereas the *Yale-Brown Obsessive Compulsive Scale* (YBOCS; Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann et al., 1989) does not use the word “worry” in any of the items, it does include worry-related content not specific to OCD (e.g., I fear doing something embarrassing), which may create a problematic degree of overlap with a measure of worry (Wells & Papageorgiou, 1998). Thus, any similarities found may be due to overlapping items across measures as opposed to true differences.

Additionally, measures often use the words “worry,” “ruminate,” or “obsessions” in the items (Burns et al., 1996; Tallis & de Silva, 1992), which raises two critical issues. First, most lay people may not distinguish between these thought styles and use them interchangeably (as do many researchers). Therefore, when assessing these constructs simultaneously, asking about an individual’s worry or rumination does not ensure that respondents are referencing the correct construct. On the other hand, defining the constructs based on assumptions about discriminating features could bias participants’ responses. For example, defining rumination versus worry might include temporal orientation. This would be a confound in a study attempting to measure whether these constructs truly differ in terms of temporal orientation.

Finally, some key measures are contaminated with items assessing diagnostic criteria. For example, rumination was found to be associated with depression: however, the RRS has depression symptoms embedded in many items (e.g., trying to understand why I am depressed). Similarly, the PSWQ items include symptoms of GAD (e.g., I worry all the time). Thus, whether the constructs themselves versus items on the questionnaires are associated with differential forms psychopathology is also an empirical question that can only be answered if the measures do not include disorder-specific symptoms (i.e., chronic worry). Accordingly, there is a need for a more objective way of evaluating distinctions between worry, rumination, and obsessions.

Present Studies

Accurately capturing differentiation of perseverative thought types linked to psychopathology and understanding whether such differences are common across disorders or specific to some, may be important to designing effective treatments. Thus, the following two studies describe the development and preliminary validation of the PCQ, a process and content measure of maladaptive repetitive thought. Because such thought processes occur dimensionally within a nonclinical sample, our first step was to validate the measure within this group. It was hypothesized that a questionnaire that assessed worry, obsessive thinking, and rumination within the same measure and using the same scale, that did not refer directly to these constructs, and that included a representative sample of items pertaining to each of six theoretically derived discriminating dimensions, would show construct, convergent, discriminant, and incremental validity. Given problems with using prior measures to assess differences between these constructs in tandem, it is important to note that a new measure that does not entail these measurement issues, may lead us to revisit our assumptions about similarities and differences between these constructs. If validated, such a measure could later be used to reexamine presumptions of similarity and divergence. Nonetheless, theory and research suggest six dimensions of worry, rumination, and obsessive thinking: (1) LC, capturing persistent thoughts not easily suppressed; (2) PF, capturing a belief that possible negative events can be evaded via prolonged, albeit inconclusive, thinking; (3) EW, capturing anticipating the worst outcome; (4) SC, capturing understanding a situation by analyzing and dwelling on potential causes and meaning; (5) DP, capturing persistent thoughts about prior experiences; and (6) DT, capturing thoughts characterized as bizarre, unacceptable, or outside normal experience and perceived as intrusive.

Study 1: Development of the PCQ

The purpose of this study was threefold: (1) to develop one questionnaire reflecting theoretical points of comparison between worry, rumination, and obsessive thinking while correcting for aforementioned concerns; (2) to evaluate the factor structure of the items and basic psychometric properties of the PCQ; and (3) to establish questionnaire norms for a nonclinical sample. The latter goal was important when later developing norms for a clinical population.

Method

We first reviewed thoroughly theoretical and empirical literature on conceptualizations of worry, rumination, and obsessions across disciplines to identify distinct and overlapping features. Also, we reviewed validated measures of worry, rumination, obsessive thinking, and related constructs to ensure comprehensive coverage of content, as well as to determine limitations of these measures to circumvent similar problems with potential items for the PCQ. We then generated a pool of 157 items to represent theorized common and discriminate characteristics of these constructs, adequately depicting content representative of the following six dimensions: (1) LC (e.g., I find it difficult to dismiss a thought once it has entered my head; 29 items); (2) PF (e.g., I repeatedly think about a task to avoid any problems that may arise; 36 items); (3) EW (e.g., I usually find it likely that things will turn

out poorly; 6 items); (4) SC (e.g., I repeatedly think about my feelings to discover if they have some deeper meaning; 33 items); (5) DP (e.g., I tend to replay in my mind how I acted in a past situation; 23 items); and (6) DT (e.g., I am a bad person for thinking the way I do; 30 items). A mean of 24.7 items was generated per scale.

Experts on anxiety and comorbid disorders, including licensed clinical psychology faculty, anxiety and mood disorder researchers, and advanced graduate students, were consulted to ensure items reflected the targeted construct facets. Items were rated on a 3-point Likert-type scale, where 1 = *poor,* 2 = *fair*, and 3 = *good*. Items rated as *poor* were removed. Any poorly worded items or items unrepresentative of targeted constructs were eliminated or revised. Items were also examined to ensure sufficient breadth of content and that they neither used the words "worry," "rumination," or "obsessions," or similar derivatives, nor referred to symptoms of anxiety disorders, depression, or OCD. Additional items were generated when necessary. This resulted in a final pool of 148 items (LC: 24 items; PF: 32 items; EW: 10 items; SC: 31 items; DP: 21 items; and DT: 30 items).

Participants.—A sample of 1,390 undergraduate students taking introductory psychology courses received course credit for completing the 148-item pool. They were randomly divided into three equal subsamples. Samples 1 and 2 were used for initial item derivation and Sample 3 was used to validate the PCQ structure derived in Samples 1 and 2. Sample 1 (N = 464) was 67% female and 33% male with a mean age of 19 years. It comprised 77% White, 6% Asian, 5% African Americans, 3% Hispanic, 0.8% Pacific Islander, 0.4% Native American, 4% more than one ethnicity, and 5% other. Sample 2 (N = 463) was 63% female and 37% male with a mean age of 19 years. It comprised 78% White, 5% Asian, 5% African Americans, 5% Hispanic, 0.3% Pacific Islander, 3% more than one ethnicity, and 4% other. Sample 3 (N = 463) was 64% female and 36% male and comprised 78% White, 5% Asian, 7% African Americans, 2% Hispanic, 0.3% Pacific Islander, 4% more than one ethnicity, and 4% other. Chi-square tests revealed no differences between the samples on gender (χ^2 = 1.13, df = 2, p = .569) or ethnicity (χ^2 = 13.25, df = 14, p = .507). An ANOVA revealed no difference on age (F = 1.31, df = 2, p = .271).

Procedure.—Items were administered online and rated on a 6-point Likert-type scale (0 = *strongly disagree;* 5 = *strongly agree*). This allowed for response variability and elimination of any tendency to overuse the scale midpoint. The study was human subjects approved.

Data Analysis.—As recommended in Matsunaga (2010), we first ran principal component analysis (PCA), followed by exploratory factor analysis (EFA) and parallel analysis (PA; Watkins, 2006), and then confirmatory factor analysis (CFA). IBM® SPSS 22 was used for PCA and EFA. PA used Watkins's (2011) Monte Carlo PCA Version 2.3, a RealBASIC program, which allows specification of 3 to 300 variables, 100 to 2,500 participants, and 1 to 1,000 replications. Finally, CFA used LISREL 8.80 (Jöreskog & Sörbom, 2006), with maximum likelihood estimation. To lower the likelihood that solutions capitalized on chance (MacCallum, Roznowski, & Necowitz, 1992), these procedures were conducted in three separate samples.

PCA used promax rotation ($\kappa = 4$), which allowed components to correlate, given the relationship between repetitive thought facets. Items with factor loadings ≥.5 on one component and ≤.2 on all other components were retained. This reduced the 148-item pool to fewer components with minimal information loss. The more conservative item selection criteria facilitated distinguishability of components. Random normal data were generated with the same number of variables and subjects as the reduced item pool (Watkins, 2006). This artificial data set was then factor analyzed 1,000 times where eigenvalues for variables were calculated via a Jocobi routine. Mean eigenvalues and *SD*s were computed across replications and compared with eigenvalues of factors extracted from the original data. Factors were kept if the eigenvalue of the original factor was greater than the mean of the eigenvalues for the parallel factor.

Next, we conducted EFA with promax rotation on the reduced item pool in conjunction with PA, to determine the optimal number of factors to extract accounting for the data's variance and to remove items that did not load onto any of the extracted factors. PA was selected because it is a consistently accurate extraction method (Zwick & Velicer, 1986). Once number of factors was determined, a second EFA was performed, constrained to the specified number of factors. As with the PCA, items were retained if they followed the .5/.2 cutoff rule.

We used CFA with maximum likelihood estimation to verify if the factor structure obtained using EFA/PCA showed optimal fit to the data in Samples 2 and 3. Model fit was evaluated using multiple complimentary fit indices (Hu & Bentler, 1999), including the standardized root mean square residual (SRMR; recommended value ≤.08), root mean square error of approximation (RMSEA; recommended value ≤.06), and comparative fit index (CFI; recommended value ≥.95). Coefficient alpha, average interitem correlations, and scale intercorrelations were computed for each PCQ scale to establish internal validity of the measure.

Results

PCA revealed 17 major components. However, based on the .5/.2 cutoff rule, the pool was reduced to 65 items loading onto the first eight components. Components 1 to 6 coincided with the hypothesized PCQ factor structure. In Sample 2, this reduced pool was subjected to EFA. PA procedures suggested a six-factor solution in accordance with the theorized factor structure. After constraining the 65-item pool to six factors, three rounds of item reduction were performed until they followed the .5/.2 cutoff rule. The final measure had 45 items. The six-factor solution was validated using CFA. Given sensitivity of the χ^2 statistic to sample size, it was significant, $\chi^2(930) = 2044.81$, $p < .001$. Indices converged supporting fit of the data to a six-factor model (CFI = .98; SRMR = .053; RMSEA = .051, 90% confidence interval for RMSEA [.048, .054], RMSEA *p* for close fit = .30). The six-factor solution was then validated in Sample 3 ($N = 463$). As expected, the χ^2 was significant, $\chi^2(930) = 2220.96$, $p < .001$, and other fit indices again supported a six-factor model fit (CFI = .98; SRMR = .056; RMSEA = .055, 90% confidence interval for RMSEA [.052, .058], RMSEA *p* for close fit = .0036).

Factors in the final solution were LC (5 items), PF (7 items), EW (4 items), SC (4 items), DP (14 items), and DT (11 items). All 45 items in the final measure demonstrated a Flesch–Kincaid Grade Level of 5.8, and a Flesch Reading Ease of 73.7. Including instructions, the measure had a Flesh–Kincaid Grade Level of 5.9, and a Flesch Reading Ease of 73.2.

Tables 1 and 2 present standardized factor loadings, factor intercorrelations, and scale psychometrics. Factor intercorrelations ranged from .12 to .73. Coefficient alphas ranged from .87 to .96 (Total PCQ α = .96). Average interitem correlations were .58 for LC, .65 for PF, .67 for EW, .66 for SC, .65 for DP, and .61 for DT. Overall, these values suggest that each factor contained a relatively narrow range of content. There were no gender differences on any PCQ scales.

Discussion

Factor analyses and scale statistics provided strong evidence for a six-factor solution depicting theorized characteristics of worry, rumination, and obsessive thinking: LC, PF, EW, SC, DP, and DT. PCQ scales demonstrated sound internal consistency. Findings support theoretical distinctions between forms of RNT.

Study 2: Assessing Reliability and Validity of the PCQ

This study had three major goals: (1) to assess temporal dependency of the PCQ; (2) to examine convergent, discriminant, and incremental validity; and (3) to examine the effect of symptoms of GAD, depression, and OCD on change in PCQ facets across short time intervals. Although frequency and intensity might vary due to situational influences (Roach, Salt, & Segerstrom, 2010), it does not necessarily reflect a true change in perseverative thinking style. Thus, when evaluating retest reliability, we chose 1- and 2-week intervals for two reasons. First, since rumination is implicated in the onset and maintenance of depression (Nolen-Hoeksema, 1991), and depressive symptoms substantially vary over time, the chosen intervals were less likely to capture individuals either entering or remitting from a depressive episode. Furthermore, shorter time periods are less susceptible to major stressors experienced by undergraduates, such as examination periods and variable workload, depending on time of the semester.

Given the trait-like nature of perseverative thinking, we did not expect PCQ facets to change meaningfully over the selected intervals, as evidenced by high retest correlations. As indicated by Chmielewski and Watson (2009), low transient-related measurement error would be reflected in high retest correlations over short time periods. Any change during these time intervals is unlikely to reflect real change in individuals' levels of perseverative thinking, and thus retest reliability coefficients likely depict dependability between PCQ scales (Chmielewski & Watson, 2009). All in all, we endeavored to show that PCQ scales would not vary meaningfully over 1- and 2-week time intervals. Likewise, it was expected that different perseverative facets would not differ in their level of transient-related measurement error.

We aimed to assess whether PCQ scales were discriminated from measures of perseverative thought in theoretically meaningful ways. Lack of controllability is a common aspect of

many forms of repetitive thought, but likely correlates with the degree to which thought styles are viewed as unconstructive. Thus, we predicted that measures of pathological worry, rumination and brooding, and obsessions/impulses related to harm, threat estimation, and overvalued ideation would discriminate the LC scale from PCQ scales capturing perceived positive functions of perseverative thinking. We also predicted that the DT scale would be more highly related to measures of overvalued ideation and superstition, punishment, and responsibility compared with other PCQ scales. Likewise, we predicted that this differential association was less likely for measures capturing ego-dystonia. Temporal orientation theories suggested that rumination measures would discriminate DP from future-oriented PCQ scales of EW and PF. The opposite relationship was expected for measures capturing preparing for future negative events, such as worry and RNT, related to superstition, punishment, responsibility, threat estimation, and perfectionism.

Moreover, PF and SC scales reflect perceived constructive aspects of perseverative thinking. Worry and compulsive behaviors are both efforts to counteract beliefs that something negative could happen (Tallis & de Silva, 1992). Similarly, reflection and searching for meaning are perceived as more deliberate and constructive processes. Accordingly, we predicted that the PF scale would be more highly associated with measures of worry and positive beliefs about worry and obsessions related to responsibility, threat estimation, and perfectionism, whereas the SC scale would more highly correlate with measures of reflection.

Given that the PCQ was constructed with the aim of capturing distinguishing features of worry, rumination, and obsessive thinking, it was expected that facets theoretically associated with worry (i.e., PF and EW) would be more closely associated with measures of anxiety (e.g., GAD-Q-IV, Depression Anxiety Stress Scale [DASS]–Anxiety), facets associated with rumination (i.e., SC and DP) would be more closely associated with measures of depression (e.g., Beck Depression Inventory–II [BDI-II], DASS–Depression, Inventory of Depression and Anxiety Symptoms [IDAS]–General Depression), and facets associated with obsessive thinking (i.e., DT) would be more closely associated with measures of OCD. We further hypothesized that the PCQ would predict symptoms of anxiety, depression, and OCD above and beyond measures of repetitive thinking targeting worry, rumination, or obsessive thinking alone. Finally, repetitive thinking has been viewed as an episodic, as well as a trait-like, phenomenon (Segerstrom et al., 2012) maintained by anxiety and depression. Thus, we predicted that greater symptom levels would be associated with increased perseverative thinking, as measured by the PCQ, over 1-week time intervals.

Method

Participants.—In exchange for course credit, 399 psychology students participated. The sample was 63% female and 37% male with a mean age of 20 years. It comprised 74% White, 8% Asian, 5% African American, 4% Hispanic, 0.3% Native American, 3% multiethnic, and 7% other. Approximately 36% (N = 144) agreed to complete the PCQ again 1 week after completing the first set of questionnaires, and 96% (N = 138) completed the PCQ for a third time 1 week later. Based on a score of 5.7 or higher on the GAD-Q-IV, 32% of the sample exhibited elevated GAD symptoms. Additionally, 15% of the sample exhibited

at least moderate depression. Finally, 19% of the sample scored one *SD* or more above the mean on OCD obsessions and compulsions.

Measures

Measures of Repetitive Thinking.

Perseverative Cognitions Questionnaire.: This 45-item survey evaluates distinct and common facets of worry, rumination, and obsessive thinking on six dimensions: LC, PF, EW, SC, DP, and DT, using a 6-point Likert-type scale (0 = *strongly disagree;* 5 = *strongly agree;* see Appendices A and B).

Penn State Worry Questionnaire **(Meyer et al., 1990).:** This is a 16-item measure of pathological worry using a 5-point Likert-type scale (1 = *not at all typical*; 5 = *very typical*). It has very good internal consistency (α = .83-.93; Molina & Borkovec, 1994). Adequate retest correlations were demonstrated (*r*s ranging from .74 to .93 across periods ranging from 2 to 10 weeks), as well as moderate to strong correlations with measures of anxiety (*r*s ranging from .40 to .74) and a weaker correlation with a measure of depression (*r* = .36; Molina & Borkovec, 1994). Internal consistency (α) in the current sample was .93.

Meta-Cognitions Questionnaire **(MCQ; Cartwright-Hatton & Wells, 1997).:** This 30-item measure of beliefs about worry and intrusive thoughts uses a 4-point Likert-type scale (1 = *do not agree*; 4 = *agree very much*). It has five scales: (1) Positive Beliefs about Worry; (2) Negative Beliefs about Uncontrollability of Thoughts and Corresponding Danger; (3) Lack of Cognitive Confidence; (4) Negative Beliefs about Thoughts in General, including themes of Superstition, Punishment, and Responsibility (Negative Beliefs–SPR [superstitious, punishment and responsibility]); and (5) Cognitive Self-Consciousness. All scales correlated with measures of anxiety (*r*s ranging from .26 to .73 and OCD (*r*s ranging from .28 to .74). Significant differences were found between clinical groups (GAD vs. OCD) and controls on several scales. Current sample α ranged from .75 to .90.

Rumination–Reflection Questionnaire **(RRQ; Trapnell & Campbell, 1999).:** The 24-item RRQ assesses rumination and reflection on a 5-point Likert-type scale (1 = *strongly disagree*; 5 = *strongly agree*). The RRQ scales correlated with measures of private self-consciousness (*r*s = .36-.47, for Rumination and .53-.63, for Reflection) and neuroticism (*r*s = .22-.64, for Rumination and .14-.18, for Reflection). Current sample α ranged from .90 to .91.

Response Styles Questionnaire **(Nolen-Hoeksema & Morrow, 1991).:** The 22-item RRS from the Response Styles Questionnaire assesses a tendency to engage in ruminative self-focused, symptom-focused thinking in response to depressed mood using a 4-point Likert-type scale (1 = *almost never*; 4 = *almost always*), and comprises two scales: Brooding and Reflection. The RRS showed good 5-month retest association (*r* = .80), and was moderately associated with depression at 1- (*r* = 56) and 6-month (*r* = .42) interviews (Nolen-Hoeksema, Parker, & Larson, 1994). Current sample α ranged from .85 to .86.

Positive Beliefs about Rumination Scale **(PBRS; Papageorgiou & Wells, 2001).:** The 9-item PBRS measures helpfulness of depressive rumination on a 4-point Likert scale (1 = *do not agree*; 4 = *agree very much*). It has good internal consistency (α = .89; .93 in the current sample) and retest correlation over a 6-week period (*r* = .85) and adequate convergent and divergent validity.

Obsessive Beliefs Questionnaire **(OBQ; Obsessive Compulsive Cognitions Working Group, 2001, 2003, 2005).:** The OBQ-44 is a 44-item version of the 87-item OBQ, covering six key beliefs of OCD: Control of Thoughts, Importance of Thoughts, Responsibility, Intolerance of Uncertainty, Overestimation of Threat, and Perfectionism rated on a 7-point Likert-type scale (1 = *disagree very much*; 7 = *agree very much*). It has three factors: (1) Responsibility and Threat Estimation (Responsibility), (2) Perfectionism and Intolerance of Uncertainty (Perfectionism), and (3) Importance and Control of Thoughts (Importance). It has good internal consistency in both clinical and nonclinical samples (α = .89-.95), weak to strong correlations with measures of OCD-related symptoms (*r* = .19-.62; Obsessive Compulsive Cognitions Working Group, 2005). Current sample α ranged from .88 to .93.

Self-Report Symptom Measures.

Generalized Anxiety Disorder Questionnaire–IV **(GAD-Q-IV; Newman et al., 2002).:** This 30-item self-report tool was designed to assess *Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition* criteria for GAD. It has high sensitivity and specificity in classifying individuals as having GAD based on a diagnostic interview, good internal consistency (α = .84) and 2-week retest correlations (*r* = .81), and modest to strong correlations with measures of worry (*r* = .63), trait anxiety (*r* = .58), and depression (*r* = .23) in a college sample (Newman et al., 2002). Current sample α was .94.

Beck Depression Inventory–II **(Beck, Steer, & Brown, 1996).:** The 21-item BDI-II assesses depression symptoms over the past 2 weeks using a 4-point Likert-type scale ranging from 0 to 3. Internal consistency (α) was .92 and .93 for a psychiatric outpatient sample and .93 for a university sample (.92 in the current sample). It also has a strong 1-week retest correlation (*r* = .93) and correlations with measures of depression, hopelessness, and suicide from .37 to .71.

Depression Anxiety Stress Scales **(Lovibond & Lovibond, 1995a).:** The 42-item DASS assesses depression, anxiety, and stress over the prior week on a 4-point Likert-type scale (0 = *does not apply to me at all*; 3 = *applies to me very much*). It has good internal consistency (α = .81-.96; current sample = .92-.96; Brown, Chorpita, Korotitsch, & Barlow, 1997; Lovibond & Lovibond, 1995b) and adequate 2-week retest correlations (from .71 to .81) and discriminant validity (Brown et al., 1997).

Inventory of Depression and Anxiety Symptoms **(Watson et al., 2007).:** The 64-item IDAS captures symptoms of major depression and related anxiety disorders. It has two broad scales, General Depression and Dysphoria, and 10 specific symptom scales: Suicidality, Lassitude, Insomnia, Appetite Loss, Appetite Gain, Ill Temper, Well-Being, Panic, Social Anxiety, and Traumatic Intrusions. It has internal consistency alphas ranging from .67 to .92

(.84-.92 in the current sample). The specific symptom scales had good discriminant and convergent validity across adult, student (e.g., university and high school), and psychiatric samples. Scales also had adequate 1-week retest correlations, ranging from .72 to .83.

***Yale–Brown Obsessive Compulsive Scale Symptom Checklist* (Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann et al., 1989).:** The clinician-administered YBOCS-SC, a measure of OCD symptom severity, has sound psychometric properties. Given the nonclinical, university sample in the current study, a 58-item self-report version (Baer, 1991) was used, which measured obsessions and compulsions on a dimensional scale (e.g., Mataix-Cols, Rosario-Campos, & Leckman, 2005; Wu, Watson, & Clark, 2007) using a 5-point Likert-type scale (0 = *strongly disagree*; 4 = *strongly agree*). Internal consistency was .91 to .93 in the current sample.

***The Positive and Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen, 1988).:** The 20-item PANAS assesses distinct dimensions of positive affect (PA) and negative affect (NA) on a 5-point Likert-type scale. Internal consistency and retest reliability have been demonstrated (Watson et al., 1988). Furthermore, the NA scale correlated significantly with psychiatric distress, depression, and state anxiety, whereas the PA scale was negatively correlated with measures of depression in a student sample. Alphas were .83 (NA) and .85 (PA) in the current sample.

Procedure.—Students elevated on screening measures for GAD (i.e., GAD-Q-IV), depression (i.e., BDI-II), and OCD (i.e., general screening questions about obsessions and compulsions) were invited to participate. Those who consented answered online questionnaires. On completion, they were invited to complete the PCQ again 1- and 2-weeks after baseline.

Data Analysis.—Pearson correlations were computed to examine retest correlations, convergent, and discriminant validity of PCQ scales. Steiger's (1980) method for comparing correlated correlations were used to evaluate differential associations between PCQ scales and measures of repetitive thinking and other psychological constructs. Linear regression examined distinctions between PCQ scales when predicting anxiety, depression, and OCD, as well as incremental validity of the PCQ scales compared with other measures of perseverative thought when predicting anxiety, depression, and OCD. The former analyses employed the enter method, and the latter analyses used the stepwise method where predictors were deleted in subsequent steps if they no longer uniquely contributed to the variance of an outcome. A linear mixed model with maximum likelihood estimation examined the effect of GAD, depression, and OCD symptoms on change in PCQ facets across three time-points. Covariate predictors included time, GAD-Q-IV, IDAS-General Depression, and YBOCS total scores, and time by symptom measure total interactions and dependent variables included change in PCQ facets.

Results

Validation Sample Descriptives.—Table 3 presents sample size, mean, and standard deviation for PCQ scales and measures of worry, rumination, reflection, obsessive thinking, anxiety, depression, and OCD.

Retest Analyses.—Table 4 shows coefficient alphas at each time-point for each scale. The mean number of days between T1 and T2, T2 and T3, and T1 and T3 were 8.45, 8.07, and 16.54, respectively. Average alphas ranged from .87 (i.e., LC) to .97 (i.e., DP). Over 1- and 2-week intervals; we found high retest reliability for the PCQ scales (βs ranging from .73 to .95).

Convergent and Discriminant Validity.—Tables 5 and 6 show correlations between PCQ scales and measures of repetitive thinking, negative affect, positive affect, anxiety (including OCD), depression, suicidality, anger, and insomnia. Positive associations were exhibited with related constructs, including worry, rumination, obsessive thinking, negative affect, GAD, depression, and OCD, and negative associations with measures of positive affect. As expected, the PCQ was more correlated with the PANAS-NA than the PA scale (Z = 13.265, p < .001), as well as the DASS-Stress scale than the IDAS Well-Being scale (Z = 14.125, p < .001).The PCQ was also more highly correlated with the IDAS–General Depression scale than the DASS–Anxiety scale (Z =−3.950, p < .001) and the YBOCS (Z = −3.237, p < .01), whereas it was more strongly correlated with the GAD-Q-IV than the DASS–Depression scale (Z = 2.389, p < .05).

For discriminant validity, it is important to examine associations with more conceptually distinct constructs. As such, the PCQ was more correlated with the GAD-Q-IV than IDAS–Suicidality (Z = 5.972, p < .001), IDAS–Ill Temper (Z = 4.930, p < .001), and IDAS–Insomnia (Z = 4.764, p < .001); with DASS–Anxiety than IDAS–Suicidality (Z = 4.141, p < .001) and IDAS-Ill Temper (Z = 2.567, p < .05); with the YBOCS than IDAS–Suicidality (Z = 3.596, p < .001) and IDAS–Ill Temper (Z = 2.463, p < .05); with IDAS–General Depression than IDAS–Suicidality (Z = 7.865, p < .001), IDAS–Ill Temper (Z = 6.506, p < .001), and IDAS–Insomnia (Z = 7.041, p < .001); and DASS–Depression than IDAS–Suicidality (Z = 5.457, p < .001), IDAS–Ill Temper (Z = 3.344, p < .001), and IDAS–Insomnia (Z = 2.595, p < .01). Although the PCQ was moderately correlated with measures of suicidality, ill temper, and insomnia, it was consistently more highly associated with measures of anxiety and depression.

In terms of the PCQ scales' differential relationships with perseverative thought measures (Table 7), some predicted associations emerged, whereas others did not. As expected, the LC scale was more strongly associated with measures of more unconstructive repetitive thoughts than other PCQ scales. To illustrate, LC correlated more highly with the PSWQ, MCQ–Uncontrollability and Danger, and RRQ–Rumination than PF, EW, SC, and DT scales. Similarly, RRS–Brooding and OBQ–Importance and Control of Thoughts were more associated with the LC than PF and SC scales. Also, the DT scale converged more highly with the MCQ–Negative Thoughts–SPR and OBQ–Importance and Control of Thoughts than the other PCQ scales.

In support of our temporal orientation hypothesis, the DP scale was more associated with RRQ–Rumination and RRS–Brooding than future-oriented PCQ scales. However, contrary to expectation, this association also emerged for worry, as reflected by the PSWQ and MCQ–Uncontrollability and Danger, and perfectionistic beliefs, as measured by OBQ Perfectionism. EW, a future-oriented scale, converged more strongly with MCQ–Negative Beliefs–SPR and OBQ–Importance and Control of Thoughts than DP. This discriminant association did not emerge for the other measures of worry (e.g., PSWQ and MCQ–Positive Beliefs about Worry).

With regard to perceived positive function of repetitive thought, data converged in support of the hypothesis that SC would be more highly correlated with measures of reflection and positive beliefs about rumination than the PF scale. In fact, SC was more strongly associated with the RRQ and RRS–Reflection than all other PCQ scales. The PF scale had patterns of divergence from RRQ–Reflection and measures of obsessions related to responsibility, threat estimation, and perfectionism, but not for MCQ–Positive Beliefs about Worry.

Table 8 presents differential relationships between PCQ scales and symptoms of anxiety, depression, and OCD. Both LC and EW significantly predicted GAD ($\beta = .164$, $t = 2.348$, $p < .05$; $\beta = .186$, $t = 3.411$, $p < .01$, respectively) and the DASS–Anxiety scale ($\beta = .184$, $t = 2.445$, $p < .05$; $\beta = .262$, $t = 4.449$, $p < .001$, respectively). Additionally, DP predicted GAD-Q-IV ($\beta = .319$, $t = 4.318$, $p < .001$), whereas DT predicted DASS–Anxiety ($\beta = .243$, $t = 4.088$, $p < .001$). Only EW positively predicted scores on the BDI-II ($\beta = .550$, $t = 3.424$, $p < .01$). Moreover, LC and EW predicted depression symptoms, as measured by the DASS–Depression ($\beta =. 170$, $t = 2.383$, $p < .05$; $\beta = .355$, $t = 6.353$, $p < .001$, respectively) and IDAS-General Depression scales ($\beta = .251$, $t = 3.746$, $p < .001$; $\beta = .301$, $t = 5.741$, $p < .001$, respectively). Conversely, PF negatively predicted DASS–Depression ($\beta = -.189$, $t = -3.585$, $p < .001$) and IDAS–General Depression ($\beta = -.107$, $t = -2.168$, $p < .05$). Whereas DT predicted DASS–Depression ($\beta = .163$, $t = 2.891$, $p < .01$), SC predicted IDAS–General Depression ($\beta = .151$, $t = 2.956$, $p < .01$). Finally, LC, PF, and DT predicted OCD symptoms, as measured by the YBOCS ($\beta = .220$, $t = 2.867$, $p < .01$; $\beta = .177$, $t = 3.128$, $p < .01$; and $\beta = .204$, $t = 3.379$, $p < .01$, respectively).

Incremental Validity.—The PCQ also demonstrated some incremental validity (see Table 9). It explained an additional 2.9% of the variance ($p < .001$) when predicting GAD symptoms with the PSWQ, and 1.3% of the variance ($p < .01$) when predicting DASS–Anxiety with the MCQ. Additionally, it explained an additional 2.5% ($p < .001$) and 7.5% of the variance ($p < .001$) when predicting DASS–Depression with the RRS–Brooding scale and PBRS, respectively. It also explained an additional 6.4% of the variance ($p < .001$) when predicting IDAS–General Depression with RRS–Brooding. Finally, it accounted for an additional 2.6% of the variance ($p < .001$) when predicting OCD symptoms with the OBQ.

Associations Between Psychopathology Impairment and Change in PCQ Scales.—More GAD, depression, and OCD symptoms, as measured by the GAD-Q-IV, IDAS–General Depression, and YBOCS at baseline, predicted an increase in LC at other time-points ($\beta = .018$, $t = 2.147$, $p < .05$; $\beta = .005$, $t = 2.145$, $p < .05$; and $\beta = .002$, $t =$

2.511. $p < .05$, respectively). Symptom measures did not predict change in PF, EW, SC, DP, and DT (all ps > .05).

Discussion

Significant associations with measures of worry, rumination, reflection, obsessive beliefs, and associated psychopathology, including anxiety, depression, and OCD, provide preliminary support for the validity of the PCQ scales, which also exhibited high dependability between measurements. In addition, the PCQ scales differentially predicted anxiety and depression, and predicted variation in GAD, depression, and OCD above and beyond validated measures of worry, rumination, and obsessions, respectively, thus providing additional validity for the PCQ.

Consistent with worry and rumination as intrusive thought processes, LC discriminated the PSWQ, RRQ rumination/brooding, RRS, and MCQ beliefs about uncontrollability, from other PCQ scales. However, this discrimination was lower for OBQ scales. This may be due to common pairing of obsessions with attempts to nullify a concern (compulsions). Even nonclinical obsessions can be nullified by behaviors meant to reduce anxiety (e.g., contamination fear and hand washing). Such pairing may create greater illusion of controllability than worry and rumination, which are not necessarily paired with attempts to evade the concern. This is consistent with findings that worry was not associated with compulsive behaviors (Abramowitz & Foa, 1998), whereas it has been associated with beliefs about uncontrollability (Belloch, Morillo, & García-Soriano, 2007; Wells & Papageorgiou, 1998). On the other hand, beliefs of thought importance and thought–action fusion predicted obsessions (Belloch et al., 2007). Nonetheless, the LC scale more significantly predicted OCD and depression symptoms, than anxiety, suggesting that perceived uncontrollability is common in anxiety, depression, and OCD.

In support of the theory that rumination is past-focused, DP was more correlated with RRQ–Rumination, than all other PCQ scales. In a like manner, RRS–Brooding was more associated with DP than SC and DT. Nonetheless, the PSWQ and MCQ–Uncontrollability and Danger displayed similar discrimination from DP as the other PCQ scales, despite theory that rumination versus worry is past-focused. Similarly, DP predicted GAD symptoms, suggesting those with higher GAD symptoms engage in both future and past repetitive thinking. Contrary to expectation, this scale did not emerge as a significant predictor of depression symptoms. This finding may be a more accurate picture of worry than theory would suggest, as perseverative thought about past events and post-event processing may be motivated by concern about negative future implications (Mathews, 1990; Wells & Papageorgiou, 1995). However, consistent with theory, PF negatively predicted depression, suggesting depressed individuals are less likely to engage in future-focused perseverative thinking. Whereas anxious individuals perseverate to prevent negative outcomes, depressed people are more likely to be suspended in pessimistic thought trains, consistent with findings of more hopelessness in depressed than anxious individuals (Beck, Brown, Steer, Eidelson, & Riskind, 1987; Beck, Wenzel, Riskind, Brown, & Steer, 2006). EW predicted both anxiety and depression symptoms, underscoring that both anxious and depressed individuals anticipate negative outcomes.

It is also noteworthy that LC and DP scales functioned similarly in relation to pathological worry and rumination and these two scales were strongly correlated. When people view situations as out of their control, they might focus on past events and “should have” thoughts as a way to temporarily enhance their sense of control. However, in the absence of resolution or forward momentum, cyclical thinking may engender a feeling of powerlessness.

Differential associations between DT and other PCQ scales were noted for measures of thought importance and need to control them, especially out of fear of punishment. As these kinds of ego-dystonic thought processes can be debilitating, individuals may attempt to control their thoughts to escape punishment. Moreover, worry and rumination do not generally involve abhorrent content (e.g., belief that one has committed a violent act), and are not resisted as strongly, which is more characteristic of OCD. However, worry and rumination may be as or more distressing, especially if they exacerbate a sense of a loss of control. For instance, worry was viewed as more disturbing, and interfering than obsessive intrusions in a nonclinical sample (Clark & Claybourn, 1997). Nonetheless, DT significantly predicted OCD symptoms, highlighting the ego-dystonic nature of OCD.

With regard to positive perceived function, meaning making is typically ascribed to ruminative processes, whereas attempts to prevent bad things from happening is ascribed to worry. Consistent with this, RRS–Reflection and PBRS were more highly associated with PCQ SC than PF. Likewise, SC was more associated with RRQ and RRS–Reflection than all other PCQ scales. Moreover, SC predicted depression symptoms, as measured by the IDAS-General Depression scale. At the same time, consistent with findings of worry and obsessions as equally related to understanding (Watkins et al., 2005), SC was highly related to such measures, Furthermore, SC converged less highly than PF with obsessions of responsibility and threat. Likewise, threat estimation obsessions and overvalued ideation discriminated SC from LC, but no worry measures exhibited this pattern. Whereas estimation of threat is part of preventing future problems, worry measures may not have been able to distinguish between control and understanding since people might vacillate between emotion-focused and problem-focused thinking during worry. Overall, these findings illustrate the continuum between constructive and unconstructive aspects of RNT.

Also, greater levels of GAD, depression, and OCD symptoms predicted positive change in repetitive thoughts characterized by lack of controllability. This supports uncontrollable thinking as a transdiagnostic factor, and underscores the relationship between elevated GAD, depression, and OCD symptoms and severity of perseverative thinking with increases in the thought uncontrollability. Given that the PCQ was administered at three time-points 1 week apart, this finding may depict a more transient, or episodic, change in perseverative thinking. Repetitive thinking (RT) is informed by both individual (e.g., symptom level) and situational (e.g., external stressors) factors. Whereas some people might be more vulnerable to fluctuations in their thoughts, others might demonstrate increased rigidity in their thinking, and thus might not exhibit episodic changes in RT. Likewise, different facets of perseverative thinking may exhibit varied temporal patterns in relation to anxiety and depression depending on the unit of time.

In sum, the PCQ assesses aspects of RT theoretically related to worry, rumination, and obsessive thinking. It captures varying degrees of severity, intrusiveness, and functionality, differentially associated with various psychological constructs. It appears to be a reliable and valid process and content measure of maladaptive repetitive thought.

General Discussion

The objective of these two studies was to construct a reliable and valid measure of six differential facets of perseverative thinking that addressed measurement concerns about comparing different types of repetitive thought in tandem. Results support the validity and reliability of the PCQ. Elevated scale scores were associated with worry, rumination, reflection, obsessive thinking, anxiety, depression, and OCD. It assesses different characteristics of RT, irrespective of content (e.g., perseverating on a distressing relationship or getting fired from one's job). Evidence of its incremental validity when predicting GAD, depression, and OCD supports using the PCQ with other measures of worry, rumination, obsessive intrusions, and related constructs to illuminate individuals' tendency toward specific kinds of maladaptive, recurrent thought and how it relates to certain types of psychopathology.

Repetitive negative thinking has been viewed as a transdiagnostic process implicated in the maintenance of emotional problems and disruption in functioning (e.g., Ehring & Watkins, 2008). However, this study endeavored to identify distinguishing features of worry, rumination, and obsessive thinking. In developing the PCQ, we addressed several measurement issues to limit confounds of assessment of types of repetitive thought in tandem. Items refrained from using the words "worry," "rumination," and "obsession," as well as disorder-related symptoms. Therefore, associations could be more accurately attributed to a relationship between the constructs reflected in each of the PCQ scales, rather than item structure or clinical symptoms captured by some of the validity measures we used. In the end, PCQ scales differentially related to repetitive thinking and symptom measures, underscoring empirical efforts to evaluate how different types of perseverative thought function across and within disorders.

The emergence of meaningful patterns of association between PCQ scales and related constructs, in combination with lack of support for some of the hypothesized relationships, challenge theoretical associations (e.g., worry as predominantly future-oriented, rumination as predominantly past focused) and underscore the need to focus on a broader range of RT in the context of diagnostic evaluation. Anxious, OCD, and/or depressed individuals are likely to exhibit elevated perseverative thoughts, but there may also be individual differences in the function of their RT (e.g., to problem solve or understand negative emotions). Whereas incorporation of specific measures of RT provides information on frequency, intensity, content, and negative effects of worry, rumination, and obsessions, the PCQ allows for examination of temporal orientation, controllability, severity, and function of one's thoughts.

Limitations and Future Directions

Despite the theoretical, empirical, and clinical importance of the findings herein, several limitations are evident. Cognitive styles and symptoms were assessed using self-report

measures only and we included no objective measures. Likewise, RT was not assessed in relation to a stressor, and thus we did not examine the utility of the PCQ as a measure of state-dependent RT. Moreover, validating a measure in a nonclinical sample is critical to ensure a range of symptomatology in respondents, but the use of an undergraduate sample reduced generalizability of the findings. Thus, an important next step in establishing the validity of the PCQ and understanding how different types of RT might discriminate groups would be to administer it to treatment-seeking samples. Also, the four samples used for development and validation comprised mostly White women. Diversity with regard to age, race, and ethnicity was limited, so the PCQ should be examined in a more diverse sample to determine if results are generalizable.

Additionally, symptoms of anxiety, depression, and OCD were associated with increased uncontrollable thinking over a 2-week period, but did not have an effect on other facets of RT measured by the PCQ. Accordingly, it would be beneficial to examine change in PCQ scales over longer time periods to better evaluate how elevated symptoms might differentially predict change in different facets of RT. The clinical utility of the measure could also be established through examination of the PCQ's sensitivity to detecting change in perseverative thought in response to treatment or stressful life events. Similarly, the PCQ was not designed to capture day-to-day fluctuations in RT. However, examination of intraindividual variability of RT styles and their common and distinguishing facets would aid our understanding of the maintenance of repetitive negative thinking and inform more fine-grained methods of assessing perseverative thought processes across and within diagnoses.

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Appendix A

Perseverative Cognitions Questionnaire (PCQ-45)

Instructions:

This inventory lists different ways of thinking. Read each statement carefully and decide how much you agree or disagree with it. For each statement, choose the response that *best describes how you think most of the time.* There are no right or wrong answers to these statements.

0	1	2	3	4	5
Strongly disagree	Moderately disagree	Disagree a little	Agree a little	Moderately agree	Strongly agree

1. After I do something I cannot stop wondering if I made a mistake.

2. Situations that have happened often drift back into my mind.
3. I am consumed by certain thoughts.
4. I feel appalled by some of my thoughts.
5. I am a bad person for thinking the way I do.
6. I become absorbed in trying to understand my thoughts, feelings, and actions.
7. I cannot help but rehash past events in my mind.
8. I repeatedly think about things to reduce the risk of danger.
9. I repeatedly think about things so I can be prepared in case something bad happens.
10. I can cause bad things to happen if I think about them happening.
11. It is sometimes as if my thoughts are not my own.
12. I often think about my moods to figure out why I feel the way I feel.
13. I often find myself repeatedly thinking about recent events, wishing they had gone better.
14. I am afraid of having inappropriate thoughts.
15. My thoughts make me uncomfortable.
16. I am surprised by how little control I have over certain thoughts.
17. I believe good things are not likely to happen to me.
18. I explore all possible outcomes in my head in an effort to solve a problem.
19. I repeatedly question the things I have done.
20. I repeatedly play back past events in my mind.
21. I usually expect the worst in ambiguous situations.
22. My attention is always focused on how I acted in past situations.
23. I repeatedly think about things that are over and done with.
24. I repeatedly think about things to figure out how to avoid or prevent bad things from happening.
25. My thoughts are shameful.
26. I repeatedly think about a problem ahead of time to prevent misfortune from occurring.
27. I usually find it likely that things will turn out poorly.
28. I believe that having a bad thought is the same as committing a bad act.
29. Some of my thoughts leave me frozen in place.
30. I find it difficult to dismiss a thought once it has entered my head.

31. I cannot get thoughts about recent occurrences out of my head.
32. Things that have happened to me unwillingly linger in my mind.
33. I tend to replay in my mind how I acted in a past situation.
34. I repeatedly think about my feelings to discover if they have some deeper meaning.
35. After a problem has long been resolved, my thoughts drift back to what happened.
36. I repeatedly think about a task to avoid any problems that may arise.
37. It is difficult for me to get things done when my mind starts to race.
38. I often turn my mind to events in my past that I should no longer be concerned about.
39. I am losing control when I have bad thoughts.
40. I repeatedly think about my thoughts, feelings, and actions to better understand myself.
41. I repeatedly think about a current problem to avoid it.
42. I frequently focus my attention on things that I can no longer do anything about.
43. I typically expect the worst to happen.
44. It is hard for me to let a thought go once it enters my head.
45. I am a terrible person for having weird or gross thoughts.

Appendix B

PCQ-45 Scoring Key

Lack of Controllability:

Thoughts that are not easily suppressed; marked by their persistence

Mean (3, 16, 30, 37, 44)

Preparing for the Future:

Thoughts marked by the belief that stressful or negative events can be avoided through prolonged, albeit inconclusive, thinking; fruitless attempt to problem solve; no real or apparent solution

Mean (8, 9, 18, 24, 26, 36, 41)

Expecting the Worst:

Thoughts in relation to anticipating the worst outcome to a situation

Mean (17, 21, 27, 43)

Searching for Causes/Meaning:

Thoughts aimed at attempts to understand a situation through analyzing and dwelling on the potential causes and meaning of a situation

Mean (6, 12, 34, 40)

Dwelling on the Past:

Persistent and inconclusive thoughts centered on events and experiences that have occurred and cannot be altered

Mean (1, 2, 7, 13, 19, 20, 22, 23, 31, 32, 33, 35, 38, 42)

Thinking Discordant with Ideal Self:

Thoughts in conflict with personality norms; may be characterized as bizarre, unacceptable, or outside normal experience; perceived as intrusive and distressing

Mean (4, 5, 10, 11, 14, 15, 25, 28, 29, 39, 45)

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Table 1.

Standardized Factor Loadings of Perseverative Cognitions Questionnaire (PCQ) Items.

		PCQ scales					
Item no.	**PCQ item**	**LC**	**PF**	**EW**	**SC**	**DP**	**DT**
44	It's hard for me to let a thought go once it enters my head	.86					
30	I find it difficult to dismiss a thought once it has entered my head	.80					
3	I am consumed by certain thoughts	.80					
16	I am surprised by how little control I have over certain thoughts	.70					
37	It's difficult for me to get things done when my mind starts to race	.67					
8	I repeatedly think about things to reduce the risk of danger		.87				
36	I repeatedly think about a task to avoid any problems that may arise		.86				
26	I repeatedly think about a problem ahead of time to prevent misfortune from occurring		.85				
9	I repeatedly think about things so I can be prepared in case something bad happens		.83				
24	I repeatedly think about things to figure out how to avoid or prevent bad things from happening		.83				
41	I repeatedly think about a current problem in order to avoid it		.73				
18	I explore all possible outcomes in my head in an effort to solve a problem		.67				
27	I usually find it likely that things will turn out poorly			.89			
21	I usually expect the worst in ambiguous situations			.86			
43	I typically expect the worst to happen			.86			
17	I believe good things are not likely to happen to me			.67			
6	I become absorbed in trying to understand my thoughts, feelings, and actions				.86		
34	I repeatedly think about my feelings to discover if they have some deeper meaning				.83		
40	I repeatedly think about my thoughts, feelings, and actions to better understand myself				.82		
12	I often think about my moods to figure out why I feel the way I feel				.73		
23	I repeatedly think about things that are over and done with					.86	
42	I frequently focus my attention on things that I can no longer do anything about					.85	
20	I repeatedly play back past events in my mind					.85	
19	I repeatedly question the things I have done					.84	
33	I tend to replay in my mind how I acted in a past situation					.82	
38	I often turn my mind to events in my past that I should no longer be concerned about					.82	
32	Things that have happened to me unwillingly linger in my mind					.82	

Item no.	PCQ item	PCQ scales					
		LC	PF	EW	SC	DP	DT
35	After a problem has long been resolved, my thoughts drift back to what happened					.82	
7	I cannot help but rehash past events in my mind					.81	
1	After I do something I cannot stop wondering if I made a mistake					.79	
13	I often find myself repeatedly thinking about recent events, wishing they had gone better					.78	
31	I cannot get thoughts about recent occurrences out of my head					.77	
2	Situations that have happened often drift back into my mind					.76	
22	My attention is always focused on how I acted in past situations					.73	
25	My thoughts are shameful						.84
11	It is sometimes as if my thoughts are not my own						.84
45	I am a terrible person for having weird or gross thoughts						.83
5	I am a bad person for thinking the way I do						.83
39	I am losing control when I have bad thoughts						.79
15	My thoughts make me uncomfortable						.78
28	I believe that having a bad thought is the same as committing a bad act						.76
4	I feel appalled by some of my thoughts						.75
14	I am afraid of having inappropriate thoughts						.75
10	I can cause bad things to happen if I think about them happening						.71
29	Some of my thoughts leave me frozen in place						.70

Note. N = 463. LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self.

Table 2.

PCQ Scale Intercorrelations and Scale Statistics.

							Men (n = 135)		Women (n = 237)		
	1	**2**	**3**	**4**	**5**	**6**	***M***	***SD***	***M***	***SD***	***t***
Scale											
1. LC	(.87)						2.64	1.04	2.71	1.25	−0.58
2. PF	.55	(.93)					3.02	1.12	2.99	1.20	0.27
3. EW	.57	.48	(.89)				1.86	1.25	1.89	1.35	−0.18
4. SC	.65	.59	.49	(.89)			2.63	1.27	2.75	1.30	−0.85
5. DP	.73	.63	.63	.69	(.96)		2.72	1.20	2.86	1.25	−1.07
6. DT	.31	.12	.39	.26	.25	(.94)	1.17	1.04	1.06	1.13	0.93
PCQ Total	(.96)						2.29	0.82	2.33	0.95	−0.34

Note. N = 463. Scale reliability coefficients appear on the diagonal. PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self.

Table 3.

Validation Sample Descriptives.

	n	M	SD
PCQ			
LC	399	2.67	1.13
PF	399	2.84	0.99
EW	399	1.82	1.23
SC	399	2.74	1.17
DP	399	2.87	1.06
DT	399	1.31	0.90
PCQ Total	399	2.36	0.84
Worry			
PSWQ	399	49.13	13.67
MCQ–Positive Beliefs	396	9.70	4.08
MCQ–Uncontrollability and Danger	396	10.36	4.35
MCQ–Negative Beliefs–SPR	396	9.98	3.32
Rumination			
RRQ–Rumination	395	37.16	10.32
RRS–Brooding	399	1.99	0.75
PBRS	396	16.40	6.30
Reflection			
RRQ–Reflection	395	37.69	9.58
RRS–Reflection	399	1.74	0.69
Obsessive Thinking			
OBQ–Responsibility	397	3.11	1.08
OBQ–Perfectionism	397	3.59	1.22
OBQ–Importance	397	2.50	0.98
YBOCS–Obsessions	399	32.77	22.90
Negative Affect			
PANAS-NA	394	21.28	7.34
DASS-Stress	393	9.74	8.98
Positive Affect			
PANAS-PA	394	29.21	7.34
IDAS–Well-Being	394	22.86	7.14
Anxiety			
GAD-Q	399	4.36	3.78
DASS–Anxiety	393	5.87	7.21
IDAS–Panic	394	12.40	5.40
IDAS–Social Anxiety	394	9.77	4.40
YBOCS–Total	399	53.44	36.27
Depression			
BDI-II	48	10.98	10.71

	n	M	SD
DASS–Depression	393	7.24	8.75
IDAS–General Depression	394	43.43	14.21
IDAS–Dysphoria	394	21.14	8.37
Suicidality			
IDAS–Suicidality	394	8.03	3.82
Anger			
IDAS–Ill Temper	394	8.89	4.12
Insomnia			
IDAS–Insomnia	394	12.76	5.29

Note. PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self; PSWQ = Penn State Worry Questionnaire; MCQ = Meta-Cognitions Questionnaire; SPR = superstitious, punishment and responsibility; RRQ = Rumination–Reflection Questionnaire; RRS = Ruminative Response Scale; PBRS = Positive Beliefs about Rumination Scale; OBQ = Obsessive Beliefs Questionnaire; YBOCS = Yale–Brown Obsessive Compulsive Scale; PANAS–PA and NA = Positive and Negative Affect Schedule–Positive Affect and Negative Affect; DASS = Depression Anxiety Stress Scale; IDAS = Inventory of Depression and Anxiety Symptoms; GAD-Q = Generalized Anxiety Disorder Questionnaire; BDI-II = Beck Depression Inventory-II.

Table 4.

Coefficient Alpha Reliability and 1- and 2-Week Reliability of PCQ Scales.

	T1	T2	T3		T1 → T2	T2 → T3	T1 → T3
PCQ scales	**α**	**α**	**α**	***M***	**β**	**β**	**β**
LC	.84	.89	.89	.87	.77*	.87*	.77*
PF	.87	.92	.94	.91	.80*	.86*	.74*
EW	.89	.92	.94	.92	.82*	.90*	.79*
SC	.84	.91	.93	.89	.79*	.86*	.77*
DP	.95	.97	.98	.97	.86*	.95*	.84*
DT	.89	.91	.94	.91	.81*	.89*	.74*
PCQ total	.96	.97	.98	.97	.87*	.94*	.86*

Note. T1 $N = 399$, T2 $N = 144$, and T3 $N = 138$. T1 and T2 were approximately 1 week apart ($M = 8.45$ days). T2 and T3 were approximately 1 week apart ($M = 8.07$ days). T1 and T3 were approximately 2 weeks apart ($M = 16.54$ days). PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self.

*$p < .001$.

Table 5.

Convergent Validity of PCQ Scales and Measures of Repetitive Thinking.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
PCQ																			
1. LC	(.84)																		
2. PF	.49***	(.87)																	
3. EW	.56***	.41***	(.89)																
4. SC	.60***	.54***	.41***	(.84)															
5. DP	.79***	.62***	.60***	.61***	(.95)														
6. DT	.61***	.34***	.62***	.47***	.52***	(.89)													
Worry																			
7. PSWQ	.63***	.46***	.53***	.46***	.65***	.38***	(.93)												
8. MCQ–Positive Beliefs	.38***	.36***	.40***	.32***	.38***	.32***	.48***	(.90)											
9. MCQ–Uncontrollability and Danger	.61***	.38***	.48***	.44***	.57***	.49***	.70***	.49***	(.90)										
10. MCQ–Negative Beliefs–SPR	.36***	.29***	.40***	.25***	.31***	.44***	.37***	.36***	.49***	(.75)									
Rumination																			
11. RRQ–Rumination	.69***	.48***	.51***	.54***	.78***	.45***	.68***	.40***	.63***	.31***	(.91)								
12. RRS–Brooding	.57***	.39***	.56***	.49***	.60***	.48***	.64***	.41***	.66***	.46***	.63***	(.86)							
13. PBRS	.44***	.34***	.45***	.50***	.44***	.39***	.47***	.90***	.53***	.50***	.53***	.57***	(.93)						
Reflection																			
14. RRQ–Reflection	.23***	.27***	.07	.50***	.18***	.22***	.13***	.23***	.24***	.07	.24***	.19***	.32***	(.90)					
15. RRS–Reflection	.49***	.34***	.44***	.60***	.47***	.48***	.51***	.39***	.56***	.39***	.53***	.71***	.65***	.41***	(.85)				
Obsessive Thinking																			
16. OBQ–Responsibility	.48***	.50***	.49***	.39***	.47***	.47***	.51***	.44***	.50***	.52***	.51***	.52***	.54***	.21***	.45***	(.91)			
17. OBQ–Perfectionism	.47***	.49***	.47***	.40***	.53***	.37***	.60***	.49***	.54***	.49***	.61***	.59***	.51***	.13**	.46***	.74***	(.93)		
18. OBQ–Importance	.36***	.24***	.42***	.20***	.32***	.57***	.32***	.26***	.36***	.52***	.28***	.36***	.36***	.02	.32***	.63***	.54***	(.88)	
19. YBOCS–Obsessions	.46***	.34***	.43***	.32***	.42***	.45***	.46***	.35***	.48***	.40***	.44***	.56***	.48***	.14**	.45***	.56***	.52***	.45***	(.93)

Note. N = 399. Scale reliability coefficients appear on the diagonal. PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self; PSWQ = Penn State Worry Questionnaire; MCQ = Meta-Cognitions Questionnaire; SPR = superstitious, punishment and responsibility; RRQ = Rumination–Reflection Questionnaire; RRS = Ruminative Response Scale; PBRS = Positive Beliefs about Rumination Scale; OBQ = Obsessive Beliefs Questionnaire; YBOCS = Yale–Brown Obsessive Compulsive Scale.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 6.

External Correlates of the PCQ.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. LC	(.84)																						
2. PF	.49***	(.87)																					
3. EW	.56***	.41***	(.89)																				
4. SC	.60***	.54***	.41***	(.84)																			
5. DP	.79***	.62***	.60***	.61***	(.95)																		
6. DT	.61***	.34***	.62***	.47***	.52***	(.89)																	
7. PCQ Total	.86***	.71***	.74***	.73***	.91***	.76***	(.96)																
Negative Affect																							
8. PANAS-NA	.50***	.23***	.50***	.36***	.47***	.51***	.55***	(.83)															
9. DASS–Stress	.58***	.34***	.58***	.42***	.54***	.50***	.62***	.76***	(.95)														
Positive Affect																							
10. PANAS–PA	−.30***	−.11*	−.41***	−.25***	−.30***	−.25***	−.33***	−.13*	−.31***	(.85)													
11. IDAS–Well-Being	−.35***	−.15***	−.48***	−.21***	−.34***	−.31***	−.38***	−.29***	−.37***	.69***	(.90)												
Anxiety																							
12. GAD–Q	.57***	.39**	.50***	.43***	.60***	.43***	.62***	.57***	.62***	−.29***	−.34***	(.94)											
13. DASS–Anxiety	.45***	.28***	.50***	.30***	.40***	.50***	.50***	.73***	.81***	−.22***	−.24***	.49***	(.92)										
14. IDAS–Panic	.37***	.17**	.40***	.26***	.31***	.45***	.41***	.63***	.67***	−.20***	−.17**	.43***	.82***	(.88)									
15. IDAS–Social	.49***	.32***	.49***	.42***	.50***	.50***	.57***	.62***	.71***	−.25***	−.22***	.54***	.67***	.65***	(.84)								
Anxiety																							
16. YBOCS–Total	.46***	.37***	.42***	.32***	.41***	.45***	.51**	.43***	.56***	−.25***	−.21***	.43***	.47***	.46***	.54***	(.96)							
Depression																							
17. BDI-II	.49***	.26***	.56***	.38***	.46***	.53***	.55***	.44**	.45**	−.45**	−.51***	.56***	.54***	.22	.40**	.59***	(.93)						
18. DASS–	.49***	.19***	.55***	.36***	.44***	.50***	.53***	.66***	.77***	−.43***	−.43***	.52***	.75***	.63***	.63***	.47***	.59***	(.96)					
Depression																							
19. IDAS–General	.60***	.32***	.57***	.47***	.56***	.50***	.63***	.69***	.77***	−.45***	−.54***	.66***	.65***	.65***	.68***	.54***	.54***	.78***	(.92)				
Depression																							
20. IDAS–Dysphoria	.62***	.33***	.56***	.51***	.58***	.52***	.65***	.72***	.80***	−.41***	−.47***	.67***	.68***	.65***	.71***	.54***	.48**	.79***	.96***	(.91)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Suicidality																							
21. IDAS–Suicidality	.29***	.10	.38***	.17**	.24***	.40***	.33***	.50***	.49***	−.15**	−.17**	.29***	.57***	.56***	.46***	.34***	.33*	.65***	.57***	.55***	(.87)		
Anger																							
22. IDAS–III Temper	.37***	.18***	.41***	.22***	.33***	.40***	.40***	.60***	.72***	−.14**	−.17**	.38***	.60***	.58***	.50***	.46***	.36*	.59***	.62***	.63***	.59***	(.87)	
Insomnia																							
23. IDAS–Insomnia	.41***	.26***	.38***	.31***	.36***	.32***	.42***	.51***	.57***	−.22***	−.27***	.45***	.54***	.57***	.49***	.36***	.17	.50***	.73***	.65***	.41***	.50***	(.84)

Note. N = 399. Scale reliability coefficients appear on the diagonal. PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self; PANAS–PA and NA = Positive and Negative Affect Schedule–Positive Affect and Negative Affect; DASS = Depression Anxiety Stress Scale; IDAS = Inventory of Depression and Anxiety Symptoms; GAD-Q = Generalized Anxiety Disorder Questionnaire.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 7.

Discriminant Validity of PCQ Scales and Measures of Repetitive Thinking.

Perseverative Thinking Measure	PCQ Scale 1	PCQ Scale 2	*Z*
Worry			
PSWQ	LC	PF	4.98***
PSWQ	LC	EW	2.78**
PSWQ	LC	SC	4.78***
PSWQ	LC	DT	6.95***
PSWQ	EW	DT	3.98***
PSWQ	DP	PF	5.56***
PSWQ	DP	EW	3.53***
PSWQ	DP	SC	5.49***
PSWQ	DP	DT	6.90***
MCQ–Positive Beliefs	EW	DT	3.98***
MCQ–Uncontrollability and Danger	LC	PF	5.56***
MCQ–Uncontrollability and Danger	LC	EW	3.48***
MCQ–Uncontrollability and Danger	LC	SC	4.69***
MCQ–Uncontrollability and Danger	LC	DT	3.41***
MCQ–Uncontrollability and Danger	DP	PF	5.15***
MCQ–Uncontrollability and Danger	DP	EW	2.46*
MCQ–Uncontrollability and Danger	DP	SC	3.54***
MCQ–Uncontrollability and Danger	DP	DT	2.02*
MCQ–Negative Beliefs–SPR	LC	SC	2.60**
MCQ–Negative Beliefs–SPR	EW	PF	2.20*
MCQ–Negative Beliefs–SPR	EW	SC	2.97**
MCQ–Negative Beliefs–SPR	EW	DP	2.18*
MCQ–Negative Beliefs–SPR	DT	LC	2.01*
MCQ–Negative Beliefs–SPR	DT	PF	2.88**
MCQ–Negative Beliefs–SPR	DT	SC	4.02***
MCQ–Negative Beliefs–SPR	DT	DP	2.92**
Rumination			
RRQ–Rumination	LC	PF	5.61***
RRQ–Rumination	LC	EW	5.20***
RRQ–Rumination	LC	SC	4.58***
RRQ–Rumination	LC	DT	7.14***
RRQ–Rumination	SC	DT	2.10*

Perseverative Thinking Measure	PCQ Scale 1	PCQ Scale 2	*Z*
RRQ–Rumination	DP	LC	4.41***
RRQ–Rumination	DP	PF	10.10***
RRQ–Rumination	DP	EW	8.99***
RRQ–Rumination	DP	SC	8.20***
RRQ–Rumination	DP	DT	9.87***
RRS–Brooding	LC	PF	4.26***
RRS–Brooding	LC	SC	2.20*
RRS–Brooding	LC	DT	2.49*
RRS–Brooding	EW	PF	3.74***
RRS–Brooding	SC	PF	2.38*
RRS–Brooding	DP	PF	5.81***
RRS–Brooding	DP	SC	3.11**
RRS–Brooding	DP	DT	3.07**
PBRS	LC	PF	2.20*
PBRS	EW	PF	2.26*
PBRS	SC	PF	3.78***
PBRS	SC	DT	2.47*
PBRS	DP	PF	2.53*
Reflection			
RRQ–Reflection	LC	EW	3.46***
RRQ–Reflection	PF	EW	3.76***
RRQ–Reflection	PF	DP	2.12*
RRQ–Reflection	SC	LC	6.70***
RRQ–Reflection	SC	PF	5.36***
RRQ–Reflection	SC	EW	8.67***
RRQ–Reflection	SC	DP	7.99***
RRQ–Reflection	SC	DT	6.04***
RRQ–Reflection	DP	EW	2.48*
RRQ–Reflection	DT	EW	3.48***
RRS–Reflection	LC	PF	3.36***
RRS–Reflection	EW	PF	2.05*
RRS–Reflection	SC	LC	3.07**
RRS–Reflection	SC	PF	6.48***
RRS–Reflection	SC	EW	3.67***
RRS–Reflection	SC	DP	3.64***
RRS–Reflection	SC	DT	2.94**

Perseverative Thinking Measure	PCQ Scale 1	PCQ Scale 2	*Z*
RRS–Reflection	DP	PF	3.33***
RRS–Reflection	DT	PF	2.77**
Obsessive Thinking			
OBQ–Responsibility	LC	SC	2.28*
OBQ–Responsibility	PF	SC	2.63**
OBQ–Responsibility	EW	SC	2.12*
OBQ–Responsibility	DP	SC	2.05*
OBQ–Perfectionism	LC	DT	2.55*
OBQ–Perfectionism	PF	DT	2.40*
OBQ–Perfectionism	EW	DT	2.51*
OBQ–Perfectionism	DP	LC	2.17*
OBQ–Perfectionism	DP	SC	3.42***
OBQ–Perfectionism	DP	DT	3.79***
OBQ–Importance	LC	PF	2.52*
OBQ–Importance	LC	SC	3.76***
OBQ–Importance	EW	PF	3.59***
OBQ–Importance	EW	SC	4.36***
OBQ–Importance	EW	DP	2.44*
OBQ–Importance	DP	SC	2.83**
OBQ–Importance	DT	LC	5.59***
OBQ–Importance	DT	PF	6.66***
OBQ–Importance	DT	EW	4.11***
OBQ–Importance	DT	SC	8.25***
OBQ–Importance	DT	DP	5.97***
YBOCS–Obsessions	LC	PF	2.66**
YBOCS–Obsessions	LC	SC	3.47***
YBOCS–Obsessions	EW	SC	2.24*
YBOCS–Obsessions	DP	PF	2.01*
YBOCS–Obsessions	DP	SC	2.47*
YBOCS–Obsessions	DT	PF	2.15*
YBOCS–Obsessions	DT	SC	2.80**

Note. N = 399. PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst;

SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self; PSWQ = Penn State Worry Questionnaire;

MCQ = Meta-Cognitions Questionnaire; SPR = superstitious, punishment and responsibility; RRQ = Rumination–Reflection Questionnaire; RRS = Ruminative Response Scale; PBRS = Positive Beliefs about Rumination Scale; OBQ = Obsessive Beliefs Questionnaire; YBOCS = Yale–Brown Obsessive Compulsive Scale.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 8.

Differential Relationships between PCQ Scales and Symptoms of Anxiety, Depression, and OCD.

Predictor	Outcome	R^2	β	*sr*	sr^2	*t*
Anxiety						
LC	GAD-Q	.409***	.164	.091	.008	2.348*
PF			−.005	−.004	.000	−0.103
EW			.186	.132	.017	3.411**
SC			.053	.038	.001	0.991
DP			.319	.168	.028	4.318***
DT			.026	.018	.000	0.475
LC	DASS–Anxiety	.320***	.184	.103	.011	2.445*
PF			.028	.021	.000	0.507
EW			.262	.187	.035	4.449***
SC			−.023	−.017	.000	−0.406
DP			−.038	−.020	.000	−0.482
DT			.243	.172	.030	4.088***
Depression						
LC	BDI-II	.539***	.196	.120	.014	1.128
PF			−.044	−.033	.001	−0.309
EW			.550	.363	.132	3.421**
SC			−.011	−.009	.000	−0.083
DP			−.199	−.107	.011	−1.007
DT			.251	.158	.025	1.490
LC	DASS–Depression	.388***	.170	.095	.009	2.383*
PF			−.189	−.143	.020	−3.585***
EW			.355	.253	.064	6.353***
SC			.101	.074	.005	1.854
DP			.061	.032	.001	0.810
DT			.163	.115	.013	2.891**
LC	IDAS–General Depression	.459***	.251	.140	.020	3.746***
PF			−.107	−.081	.007	−2.168*
EW			.301	.215	.046	5.741***
SC			.151	.110	.012	2.956**
DP			.128	.067	.004	1.805
DT			.056	.040	.002	1.057
OCD						
LC	YBOCS Total	.285***	.220	.122	.015	2.867**
PF			.177	.134	.018	3.128**
EW			.129	.092	.008	2.152*

Predictor	Outcome	R^2	β	*sr*	sr^2	*t*
SC			−.030	−.022	.000	−0.505
DP			−.037	−.019	.000	−0.455
DT			.204	.144	.021	3.379**

Note. N = 399. PCQ = Perseverative Cognitions Questionnaire; LC = Lack of Controllability; PF = Preparing for the Future; EW = Expecting the Worst; SC = Searching for Causes/Meaning; DP = Dwelling on the Past; DT = Thinking Discordant with Ideal Self; OCD = obsessive compulsive disorder; DASS = Depression Anxiety Stress Scale; IDAS = Inventory of Depression and Anxiety Symptoms; GAD-Q = Generalized Anxiety Disorder Questionnaire; BDI-II = Beck Depression Inventory-II; YBOCS = Yale–Brown Obsessive Compulsive Scale.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 9.

Incremental Validity of the PCQ When Predicting Symptoms of Anxiety, Depression, and OCD.

	Predictor	Outcome	R^2	ΔR^2	β	*t*
Anxiety						
Model 1	PSWQ Total	GAD-Q	.563	.563***	.750	22.618***
Model 2	PSWQ Total	GAD-Q	.593	.029***	.601	14.512***
	PCQ Total				.227	5.351***
Model 1	PCQ Total	GAD-Q	.386	.386***	.622	15.773***
Model 2	PCQ Total	GAD-Q	.417	.030***	.481	9.723***
	MCQ Total				.224	4.540***
Model 1	PCQ Total	DASS–Anxiety	.254	.254***	.504	11.527***
Model 2	PCQ Total	DASS–Anxiety	.303	.049***	.311	5.556***
	PSWQ				.293	5.229***
Model 1	MCQ Total	DASS–Anxiety	.433	.433***	.658	17.270***
Model 2	MCQ Total	DASS–Anxiety	.446	.013**	.565	11.622***
	PCQ Total				.146	3.011**
Depression						
Model 1	RRS–Brooding	BDI-II	.335	.335***	.579	4.819
Model 2	RRS–Brooding	BDI-II				
	PCQ Total					
Model 1	PCQ Total	BDI-II	.306	.306***	.553	4.401***
Model 2	PCQ Total	BDI-II				
	RRQ–Rumination					
Model 1	PCQ Total	BDI-II	.300	.300***	.548	.4395***
Model 2	PCQ Total	BDI-II				
	PBRS					
Model 1	PCQ Total	BDI-II	.315	.315***	.561	12.620***
Model 2	PCQ Total	BDI-II	.369	.055***	.422	8.501***

	Predictor	Outcome	R^2	ΔR^2	β	*t*
	PBRS				.272	5.485***
Model 1	RRS–Brooding	DASS–Depression	.394	.394***	.627	15.928***
Model 2	RRS–Brooding	DASS–Depression	.418	.025***	.493	9.703***
	PCQ Total				.207	4.073***
Model 1	PCQ Total	DASS–Depression	.277	.277***	.526	12.211***
Model 2	PCQ Total	DASS–Depression				
	RRQ–Rumination					
Model 1	PCQ Total	DASS–Depression	.308	.308***	.555	13.175***
Model 2	PBRS	DASS–Depression	.383	.075***	.385	8.202***
	PCQ Total				.323	6.889***
Model 1	RRS–Brooding	IDAS–General Depression	.455	.455***	.675	18.097***
Model 2	RRS–Brooding	IDAS–General Depression	.520	.064***	.457	9.909***
	PCQ Total				.334	7.242***
Model 1	PCQ Total	IDAS–General Depression	.399	.399***	.632	16.131***
Model 2	PCQ Total	IDAS-General Depression	.441	.042***	.402	7.063***
	RRQ–Rumination				.308	5.419***
Model 1	PCQ Total	IDAS–General Depression	.399	.399***	.632	16.131***
Model 2	PCQ Total	IDAS–General Depression	.478	.079***	.457	10.636***
	PBRS				.332	7.717***
OCD						
Model 1	OBQ Total	YBOCS Total	.376	.376***	.613	15.421***
Model 2	OBQ Total	YBOCS Total	.401	.026***	.485	9.726***
	PCQ Total				.205	4.109***

Note. $N = 399$. PCQ = Perseverative Cognitions Questionnaire; PSWQ = Penn State Worry Questionnaire; MCQ = Meta-Cognitions Questionnaire; RRQ = Rumination–Reflection Questionnaire; RRS = Ruminative Response Scale; PBRS = Positive Beliefs about Rumination Scale; OBQ = Obsessive Beliefs Questionnaire; YBOCS = Yale–Brown Obsessive Compulsive Scale; DASS = Depression Anxiety Stress Scale; IDAS = Inventory of Depression and Anxiety Symptoms; GAD-Q = Generalized Anxiety Disorder Questionnaire; BDI-II = Beck Depression Inventory–II; OCD = obsessive compulsive disorder.

*$p < .05$.

** $p < .01$.

*** $p < .001$.