The Sequential Relation Between Changes in Catastrophizing and Changes in Posttraumatic Stress Disorder Symptom Severity

Stephania Donaye Pimentel,1 Heather Adams,2 Tamara Ellis,3 Robin Clark,4 Craig Sully,4 Catherine Paré,1 and Michael JL. Sullivan1

1Department of Psychology, McGill University, Montreal, Quebec, Canada
2University Centre for Research on Pain and Disability, Halifax, Nova Scotia, Canada
3Centre for Rehabilitation and Health, Toronto, Ontario, Canada
4Kootenay Health Services, Nelson, British Columbia, Canada

Catastrophizing has been discussed as a cognitive precursor to the emergence of posttraumatic stress disorder (PTSD) symptoms following the experience of stressful events. Implicit in cognitive models of PTSD is that treatment-related reductions in catastrophizing should yield reductions in PTSD symptoms. The tenability of this prediction has yet to be tested. The present study investigated the sequential relation between changes in a specific form of catastrophizing—symptom catastrophizing—and changes in PTSD symptom severity in a sample of 73 work-disabled individuals enrolled in a 10-week behavioral activation intervention. Measures of symptom catastrophizing and PTSD symptom severity were completed at pre-, mid-, and posttreatment assessment points. Cross-sectional analyses of pretreatment data revealed that symptom catastrophizing accounted for significant variance in PTSD symptom severity, $\beta = .40, p < .001, r^2 = .28$ (medium effect size), even when controlling for known correlates of symptom catastrophizing, such as pain and depression. Significant reductions in symptom catastrophizing and PTSD symptoms were observed during treatment, with large effect sizes, $d_s = 1.42$ and 0.94, respectively, $p_s < .001$. Cross-lagged analyses revealed that early change in symptom catastrophizing predicted later change in PTSD symptoms; early changes in PTSD symptom severity did not predict later change in symptom catastrophizing. These findings are consistent with the conceptual models that posit a causal relation between catastrophizing and PTSD symptom severity. The clinical implications of the findings are discussed.

Posttraumatic stress disorder (PTSD) is a debilitating mental health condition that can emerge after exposure to traumatic events; it is characterized by symptom clusters that include reexperiencing symptoms, negative cognitions, distressing emotions, avoidance, and hyperarousal (American Psychiatric Association [APA], 2013). Individuals with PTSD are at increased risk for occupational disability (Smith, Schnurr, & Rosenheck, 2005), medical illness (Pietrzak, Goldstein, Southwick, & Grant, 2011), mental health co-morbidity (Nazarian, Kimerling, & Frayne, 2012), and premature death (Schlenger et al., 2015). Moreover, the risk of chronicity is high, with 11%–44% of individuals with PTSD experiencing ongoing symptoms 2 years after their initial diagnosis (Fishbain, Pulikal, Lewis, & Gao, 2016).

The conceptual frameworks that underlie many current psychological treatments for PTSD share the view that negative or maladaptive cognitions play a pivotal role in the emergence and persistence of PTSD symptoms (Ehlers & Clark, 2000; Foa & Cahill, 2001). The role of negative or maladaptive cognitions in the onset and progression of PTSD symptoms has been most explicitly elaborated in Ehlers and Clark’s (2000) cognitive model of PTSD. According to this model, negative appraisals of the trauma and/or its sequelae give rise to an ongoing sense of threat and, in turn, contribute to the emergence and persistence of PTSD symptoms.

Several studies have provided support for this model. Cross-sectional have shown that scores on measures of negative appraisals are correlated with the severity of posttraumatic symptoms (i.e., Halligan, Michael, Clark, & Ehlers, 2003; Moser, Hajcak, Simons, & Foa, 2007). Prospective studies have revealed that negative appraisals are predictive of later PTSD severity (i.e., Dunmore, Clark, & Ehlers, 2001; Halligan et al., 2003). Furthermore, several studies have shown that treatment-related changes in negative
appraisals are correlated with changes in PTSD symptom severity (Kleim et al., 2013; Smith et al., 2007).

Recently, Gellatly and Beck (2016) proposed that a specific type of negative appraisal, namely “catastrophizing,” might be a central determinant of the onset and maintenance of symptoms of a wide range of psychological disorders, including PTSD. Gellatly and Beck (2016) posit that catastrophizing might be a transdiagnostic maladaptive process, with unique beliefs specific to each psychological disorder. They suggest that the catastrophic beliefs of individuals with PTSD take the form of exaggerated threat appraisals of the reoccurrence of an experienced traumatic event.

Research and theory have revealed a high level of consensus that catastrophizing represents a maladaptive cognitive style. However, conceptualizations and operational definitions of catastrophizing have varied across research domains. In research on emotional disorders, catastrophizing has been described as the tendency to magnify a perceived threat and overestimate the seriousness of its potential consequences (Ellis, 1962). In health psychology, catastrophizing has been conceptualized as an exaggerated threat appraisal of one’s symptoms. The Pain Catastrophizing Scale (PCS) has been the most widely used measure of symptom catastrophizing (Sullivan, Bishop, & Pivik, 1995). The development of the PCS proceeded from a multidimensional conceptualization of catastrophizing comprising elements of magnification (i.e., “I wonder whether something serious might happen”), rumination (i.e., “I can’t seem to keep it out of my mind”), and helplessness (i.e., “There is nothing I can do to reduce the intensity of my pain”). Hundreds of studies have reported on the association between symptom catastrophizing and adverse health and mental health outcomes associated with pain (Martinez-Calderon et al., 2019; Wertli et al., 2014). Over the past two decades, symptom catastrophizing has emerged as the most robust predictor of adverse health and mental health outcomes associated with pain (Schutze et al., 2018).

One limitation of the PCS is that the instructional set and item content are worded such that they specifically relate to pain. As such, the scale is not well suited for use with individuals who are not experiencing symptoms of pain. The Symptom Catastrophizing Scale (SCS) was recently developed to assess symptom catastrophizing in individuals with mental health conditions (Moore, Adams, Ellis, Thibault, & Sullivan, 2016). The item content of the SCS was derived from the PCS but modified for use with individuals with mental health conditions. Items included in the SCS reflect the same multidimensional conceptualization of symptom catastrophizing (i.e., magnification, rumination, helplessness) that guided the development of the PCS. Research has supported the reliability and validity of the SCS as a measure of catastrophic thinking in individuals with debilitating health and mental health conditions (Moore et al., 2016; Sullivan & Simon, 2012).

The present study aimed to examine the sequential relation between symptom catastrophizing and PTSD symptom severity. The study sample consisted of individuals with a diagnosis of PTSD who were enrolled in a 10-week risk-targeted behavioral activation intervention. Cross-sectional analyses were used to address whether symptom catastrophizing contributed significant variance to the prediction of PTSD symptom severity. Prospective analyses addressed whether treatment-related reductions in symptom catastrophizing were associated with reductions in PTSD symptom severity.

We used a crossed-lagged panel design to examine the association between early and late changes in symptom catastrophizing and the severity of PTSD symptoms (see Figure 1). A cross-lagged panel design involves comparing the correlation between Variable A at Time 1 and Variable B at Time 2 with the correlation between Variable B at Time 1 and Variable A at Time 2 (Kenny, 1975). This procedure permits examination of whether a change in one variable, that precedes a given change in a second variable, actually predicts the subsequent change in the second variable. Based on previous research and theory, we hypothesized that early treatment-related changes in catastrophizing would predict late treatment-related changes in PTSD symptom severity.

**Method**

**Participants and Procedure**

The study sample consisted of 73 work-disabled individuals (n = 39 women, n = 34 men) with a diagnosis of PTSD who were referred to an occupational rehabilitation service in Ontario, Canada, by their disability insurer. The data for the study sample were drawn from the deidentified files of consecutive referrals of individuals with a diagnosis of PTSD who were enrolled in a 10-week standardized behavioral activation intervention. All participants were receiving disability benefits and had been employed full time prior to the current period of sick leave. Work accidents were the most common trauma
event (64.5%), followed by being the victim of a crime (15.0%), exposure to a disaster (12.3%), and witnessing a crime (8.2%).

**Procedure**

The study was approved by the Institutional Review Board of McGill University. Information about participants’ diagnoses was taken from their long-term disability insurance files. Records were only retained for inclusion in the study sample if a file review clearly indicated that a medical professional or mental health specialist had confirmed a diagnosis of PTSD. Measures of PTSD, symptom catastrophizing, depression, and pain were completed at pre-, mid- and posttreatment time points.

**Risk-targeted behavioral activation intervention.** The behavioral activation intervention focused on goal setting, maximizing success and achievement experiences, and resumption of life role activities (Martell, Dimidjian, & Herman-Dunn, 2010). Clinicians met with participants once per week for a total of 10 weeks. In addition to techniques designed to increase patients’ involvement in purposeful activities of daily living, the behavioral activation intervention was supplemented by risk-targeted techniques to yield reductions in symptom catastrophizing. Research suggests that techniques such as education (Lee et al., 2016), guided disclosure (Sullivan et al., 1999), thought monitoring and reappraisal (Thorn et al., 2007), and activity planning (Sullivan et al., 2006) can reduce symptom catastrophizing or reduce the negative impact of symptom catastrophizing (Wideman & Sullivan, 2011). Participants first viewed an introductory video that provided them with information about PTSD and oriented them to the procedures and objectives of treatment. Guided disclosure took the form of an interview designed to foster communication of the narrative of participants’ trauma experience and posttrauma challenges. Disclosure techniques also provided a platform for offering empathic reflection and validation responses to promote the development of the working alliance. Thought monitoring and reappraisal techniques were used to increase participants’ awareness of the maladaptive nature of catastrophic thinking and to assist participants in considering more realistic appraisals of their symptoms and disability. Activity planning took the form of fostering reengagement in activities that were discontinued following the onset of PTSD.

**Clinicians.** The clinicians included 8 occupational therapists who participated in a 2-day intensive training workshop designed to equip them with the skills necessary to deliver the standardized intervention. All clinicians were trained by the lead author (MS). Clinicians received weekly supervision from a senior clinician to ensure fidelity to protocol. The risk-targeted behavioral activation intervention used in the present study is described in more detail elsewhere (Sullivan, Adams, & Ellis, 2013).

**Measures**

**Posttraumatic stress symptoms.** The Posttraumatic Stress Checklist (PCL; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) is a 17-item self-report measure of PTSD symptom severity. Respondents rate each item on a 5-point scale ranging from 1 (not at all) to 5 (extremely) to indicate the degree to which they have been bothered by different PTSD symptoms over the past month. Scores can range from 17 to 85, with higher scores reflecting more severe PTSD symptoms. The reliability and validity of the PCL have been supported in several studies (e.g., Blanchard, Hickling, et al., 1996). In the present sample, the Cronbach’s alpha value for the PCL was .92.

**Catastrophizing.** The SCS (Moore et al., 2016) was used to measure catastrophic thinking in relation to the experience of distressing mental health symptoms. The item content reflected the same multidimensional conceptualization of symptom catastrophizing used in the development of the PCS, comprising magnification (e.g., “I become afraid that my symptoms will get worse”), rumination (e.g., “I can’t seem to keep [my condition/symptoms] out of my mind”), and helplessness (e.g., “There is nothing I can do to reduce the intensity of my symptoms”; Moore, Thibault, Adams, & Sullivan, 2016). Respondents are asked to rate the frequency with which they experience seven different catastrophic thoughts, using a 3-point scale that ranges from 0 (never) to 2 (often). Scores can range from 0 to 14, with higher scores reflecting more frequent catastrophic thinking. Research has supported the reliability and validity of the SCS as a measure of symptom catastrophizing in individuals with debilitating health and mental health conditions, such as chronic pain, depression, and PTSD (Moore et al., 2016; Sullivan & Simon, 2012). In the present sample, the Cronbach’s alpha value for the SCS was .86.

**Depressive symptoms.** The Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was used to assess the severity of depressive symptoms. Respondents are asked to indicate how frequently they experience each of nine symptoms of depression, using a 4-point scale that ranges from 0 (not at all) to 3 (nearly every day). Scores can range from 0 to 27, with higher scores reflecting more severe depressive symptoms. Scores on the PHQ-9 of 5, 10, 15, and 20 represent cutoff scores for mild, moderate, moderately severe, and severe depression, respectively. The reliability and validity of the PHQ-9 have been supported by several investigations (e.g., Gilbody, Richards, Brealey, & Hewitt, 2007). In the present sample, the Cronbach’s alpha value for the PHQ-9 was .87.

**Pain severity.** The McGill Pain Questionnaire—Short-Form (MPQ-SF; Melzack, 1987) was used to measure pain severity. Participants were asked to rate their current pain intensity according to 11 sensory and four affective pain descriptors, using a scale ranging from 0 (none) to 3 (severe). Scores range from...
0 to 45, with higher scores reflecting more severe pain. The measure has been shown to be reliable (Cronbach’s α = .84–.92) and valid in various clinical populations (e.g., Lovejoy, Turk, & Morasco, 2012).

Data Analysis

All analyses were conducted with SPSS (Version 21). Preliminary analyses addressed whether trauma type was associated with dependent or independent variables central to the study objectives. One-way analyses of variance (ANOVA) revealed that scores on the SCS, F(3, 69) = 0.30, p = .822; PCL, F(3, 69) = 0.39, p = .751; and PHQ-9, F(3, 69) = p = .664, did not vary significantly as a function of trauma type. As such, trauma type was not considered in further statistical analyses. Pearson correlations were used to examine correlations among the study variables at the time of program admission. A hierarchical regression analysis was used to assess the unique contribution of symptom catastrophizing in the prediction of the severity of PTSD symptoms. We used t tests for paired samples to examine the magnitude of treatment-related changes in dependent measures. Cohen’s d effect sizes were calculated and interpreted using standard conventions of ds = 0.2, 0.5, and 0.8 reflecting small, medium, and large effects, respectively. Regression analyses across lagged correlations were used to examine the sequential relations between early and late treatment changes in levels of symptom catastrophizing and changes in the severity of PTSD symptoms. Tolerance coefficients for all variables included in the regression analyses were larger than .60, indicating no problem of multicollinearity. Power analyses were conducted with Power and Precision software (Borenstein, Rothstein, & Cohen, 2001). For two-tailed tests with an alpha value set to .05 and a power value of 0.80, a sample of 73 was found to be large enough to detect correlations of medium-to-large effect sizes. Seven participants discontinued the intervention prematurely and did not complete the posttreatment assessment. For participants with incomplete posttreatment data, the expectation-maximization (EM) algorithm was used to impute missing values (Graham & Donaldson, 1993).

Results

Sample Characteristics

The initial analyses revealed no significant differences between women and men on any study measures. As such, descriptive statistics are not reported separately by gender. Based on score thresholds for symptom measures, the study sample at the time of admission would be characterized as experiencing moderate-to-severe posttraumatic stress symptoms, moderate-to-severe depressive symptoms, and mild symptoms of pain (Blanchard, Jones-Alexander, et al., 1996; Kroenke et al., 2001; Melzack, 1987). The majority (71.2%) of participants had previously received some form of psychotherapy. Additionally, most (83.5%) participants had been prescribed some form of medication, with the most common being antidepressants (n = 49), anxiolytics (n = 40), and analgesics (n = 12). There were 13 participants who were not taking any medication.

Correlations Among Dependent Measures

Correlations among dependent measures at the time of admission are displayed in Table 1. Scores on the SCS were significantly correlated with scores on the PCL, r = .68, p < .001; and the PHQ-9, r = .61, p < .001, with large effect sizes. This pattern of findings is consistent with findings from previous research examining the relation between symptom catastrophizing and posttraumatic stress symptoms (Smith et al., 2005; Sullivan et al., 2009). Our finding of a significant correlation between measures of PTSD and depression, r = .71, p < .001 (large effect size), is also consistent with previous research (Bryant & Guthrie, 2005; McLean, Yeh, Rosenfield, & Foa, 2015; Zalta et al., 2014).

Catastrophizing as a Predictor of PTSD Symptom Severity

Hierarchical multiple regression was used to assess the value of symptom catastrophizing in predicting the severity of PTSD symptoms; this was a cross-sectional analysis using pretreatment assessment data. As shown in Table 2, age, sex, and education were entered in Step 1 of the analysis and contributed significantly to the prediction of PCL scores. Time since trauma was entered in Step 2, but it did not contribute significantly to the regression equation. In Step 3 of the analysis, pain severity was entered, and it contributed significant variance to the prediction of PCL scores. Depression was entered in Step 4 of the analysis and contributed significantly to the prediction of PCL scores. The SCS was entered into Step 5 and contributed significant variance to the prediction of PCL scores. Depression entered in Step 4 of the analysis and contributed significantly to the prediction of PCL scores. The SCS was entered into Step 5 and contributed significant variance to the prediction of PCL scores, beyond the variance accounted for by variables already in the equation. In the final regression equation, the SCS, β = .40, p < .001 (medium effect size); and the PHQ-9, β = .41, p < .001 (medium effect size), contributed significant unique variance to the prediction of PCL scores.

Treatment-Related Changes in Catastrophizing and Symptoms of Depression, Pain, and PTSD

We conducted t tests for paired samples to examine treatment-related changes for scores on the SCS, PHQ-9, MPQ-SF, and PCL. As shown in Table 3, the analyses revealed significant reductions in scores on the SCS, t(72) = 11.9, p < .001, d = 1.4; PHQ-9, t(72) = 9.3, p < .001, d = 1.1; MPQ-SF, t(72) = 4.9, p < .001, d = 0.59; and PCL, t(72) = 7.2, p < .001, d = 0.94. The magnitude of treatment-related reductions in posttraumatic stress symptoms, depressive symptoms, and catastrophizing (i.e., 25.5%–40.0%) would be considered clinically meaningful (Dworkin et al., 2009; Lowe, Kroenke, Herzog, & Grage, 2004; Scott, Wideman, & Sullivan, 2014). At treatment termination, PTSD symptom severity remained above the
Table 1
Means, Standard Deviations, and Correlations Among Dependent Measures at Time of Admission

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age (years)</td>
<td></td>
<td>.07</td>
<td>.04</td>
<td>.04</td>
<td>.10</td>
<td>.01</td>
<td>47.0</td>
<td>9.7</td>
<td></td>
</tr>
<tr>
<td>2. Duration (months)</td>
<td></td>
<td></td>
<td>.13</td>
<td>.10</td>
<td>.21</td>
<td>.01</td>
<td>14.7</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>3. SCS</td>
<td></td>
<td></td>
<td></td>
<td>.61**</td>
<td>.30</td>
<td>.68**</td>
<td>10.5</td>
<td>2.9</td>
<td>0–14</td>
</tr>
<tr>
<td>4. PHQ-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.21</td>
<td>.71**</td>
<td>17.5</td>
<td>5.9</td>
<td>0–27</td>
</tr>
<tr>
<td>5. MPQ-SF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.26</td>
<td>13.7</td>
<td>8.0</td>
<td>0–45</td>
</tr>
<tr>
<td>6. PCL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>54.8</td>
<td>15.5</td>
<td>17–80</td>
</tr>
</tbody>
</table>

Note. N = 73. SCS = Symptom Catastrophizing Scale; PHQ-9 = Patient Health Questionnaire; MPQ-SF = McGill Pain Questionnaire-SF; PCL = Posttraumatic Stress Checklist.

Clinical threshold (i.e., PCL score of 35 or higher) for 50.3% of participants, and depressive symptom severity remained above clinical threshold (i.e., PHQ-9 score of 15 or higher) for 25.4% of participants.

Early and Late Treatment-Related Reductions in Catastrophizing and PTSD Symptom Severity

Of interest for the present study was the sequential relation between changes in catastrophizing and changes in the severity of PTSD symptoms. Standardized residual change scores were computed for early (i.e., pre- to midtreatment) and late (i.e., mid- to posttreatment) changes in catastrophizing and PTSD symptom severity. Correlations among these scores are presented in Table 4. Early treatment changes in catastrophizing were significantly correlated with late changes in the severity of PTSD symptoms, $r = .28, p = .016$. However, early treatment changes in the severity of PTSD symptoms were not significantly correlated with late treatment changes in perceived injustice, $r = .06, p = .614$.

A hierarchical regression analysis was used to examine the unique contributions of early treatment changes in catastrophizing to the prediction of late treatment changes in the severity of PTSD symptoms (Table 5). To control for the potential $R$ inflation effects of synchronous and autocorrelations, early treatment changes in PTSD symptoms and late treatment changes in catastrophizing were entered as covariates in Step 1 of the analysis. Early changes in catastrophizing were entered in

Table 2
Hierarchical Regression Analysis Examining Predictors of Posttraumatic Stress Disorder (PTSD) Symptom Severity

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta^\text{a}$</th>
<th>Semipartial correlation</th>
<th>$\Delta R^2$</th>
<th>$\Delta F$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent = PCL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.01</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.08</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Education</td>
<td>.03</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td>$-.10$</td>
<td>$-.09$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>$-.10$</td>
<td>$-.09$</td>
<td>$-.00$</td>
<td>$0.01$</td>
<td>1, 68</td>
<td>.916</td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td>$+.07$</td>
<td>$+.07$</td>
<td>1, 67</td>
<td>.016</td>
</tr>
<tr>
<td>MPQ-SF</td>
<td>$+.07$</td>
<td>$+.07$</td>
<td>$+.20$</td>
<td>$48.8$</td>
<td>1, 66</td>
<td>&lt;.001</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHQ-9</td>
<td>$+.41^{***}$</td>
<td>$.31$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 5</td>
<td></td>
<td></td>
<td>$+.08$</td>
<td>$15.0$</td>
<td>1, 65</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SCS</td>
<td>$+.40^{***}$</td>
<td>$.28$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 73. df = degrees of freedom; SCS = Symptom Catastrophizing Scale; Duration = PHQ = Patient Health Questionnaire; PCL = Posttraumatic Stress Disorder Checklist.

$^a$Beta coefficients are from the final regression equation.

$^b$Time since trauma, in months.

$^{***}p < .001$. 

Table 3
Treatment-Related Changes in Dependent Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretreatment center score</th>
<th>Midtreatment score</th>
<th>Posttreatment score</th>
<th>% Change (pre–post)</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>SCS</td>
<td>10.5</td>
<td>2.9</td>
<td>7.3</td>
<td>3.2</td>
<td>6.3</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>17.5</td>
<td>5.9</td>
<td>13.3</td>
<td>6.0</td>
<td>10.7</td>
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<tr>
<td>MPQ-SF</td>
<td>13.7</td>
<td>8.0</td>
<td>11.5</td>
<td>7.9</td>
<td>9.0</td>
</tr>
<tr>
<td>PCL</td>
<td>54.8</td>
<td>15.5</td>
<td>48.2</td>
<td>15.1</td>
<td>40.8</td>
</tr>
</tbody>
</table>

Note. N = 73. SCS = Symptom Catastrophizing Scale; PHQ = Patient Health Questionnaire; MPQ-SF = McGill Pain Questionnaire-Short Form; PCL = Posttraumatic Stress Disorder Checklist.

Step 2 of the analysis and contributed significant variance to the prediction of late changes in PTSD symptoms, $\Delta R^2 = .16$, $p < .001$ (medium effect size).

A second hierarchical regression analysis was conducted to examine the unique contributions of early changes in PTSD symptom severity to the prediction of late changes in catastrophizing. Early treatment changes in catastrophizing and late treatment changes in PTSD symptom severity were entered in Step 1 of the analysis to control for the $R$ inflation effects of synchronous and autocorrelations. Early treatment changes in PTSD symptom severity were entered in Step 2 of the analysis but failed to contribute significantly to the prediction of late treatment changes in catastrophizing.

Discussion

The results of the present study are consistent with findings from previous research showing scores on a measure of symptom catastrophizing to be significantly correlated with PTSD symptom severity (Carty, O’Donnell, Evans, Kazantzis, & Creamer, 2011; Ciccone & Kline, 2012; Giummarra et al., 2017). The current findings extend previous research by showing that through the course of a risk-targeted behavioral activation intervention, early treatment changes in symptom catastrophizing predicted late treatment changes in the severity of PTSD symptoms. Additionally, we found that symptom catastrophizing was a significant and unique predictor of posttraumatic stress symptom severity. In cross-sectional analyses, catastrophizing remained a significant predictor of the severity of posttraumatic stress symptoms even when controlling for depression and pain. Changes in symptom catastrophizing through the course of treatment were also associated with changes in the severity of posttraumatic stress symptoms. Cross-lagged regressions revealed that early treatment changes in catastrophizing predicted late treatment changes in the severity of posttraumatic stress symptoms but not vice versa. This pattern of findings suggests that symptom catastrophizing may play a causal role in the persistence of posttraumatic stress symptoms.

Several previous studies have examined the association between negative symptom appraisals and PTSD symptoms. Some of the items contained in measures of negative symptom appraisals are similar to those included on the SCS (e.g., “I must be going out of my mind;” Ehlers, Mayou, & Bryant, 1998). Items on other measures of negative symptom appraisals assess idiosyncratic misinterpretation of symptoms (e.g., “If I feel guilty it must mean that I really was to blame for what happened;” “If you cannot remember something about the assault then it is because you would find it unbearable;” Dunmore et al., 1999; Dunmore, Clark, & Ehlers, 2001). At present, it remains unclear whether these different forms of negative symptom appraisals reflect similar or distinct underlying processes. One advantage of the SCS over previous approaches to assessing negative symptom appraisals is that the SCS item content does not refer to specific symptoms. As such, the scaling properties of the measure are less likely to be influenced by individual variations in symptom profiles—for example, whether the respondent experiences guilt or memory problems. A more general measure of symptom catastrophizing might facilitate assessment of catastrophizing across a range of symptom profiles. This might also facilitate exploration of the relationship between catastrophizing and symptom severity across different mental health conditions.

Table 4
Correlations Among Early and Late Changes in Catastrophizing and Posttraumatic Stress Disorder Symptom Severity

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta$SCS$_{T1-T2}$</td>
<td>–</td>
<td>.46**</td>
<td>−.08</td>
<td>.28**</td>
</tr>
<tr>
<td>$\Delta$PCL$_{T1-T2}$</td>
<td>–</td>
<td>–</td>
<td>.06</td>
<td>−.03</td>
</tr>
<tr>
<td>$\Delta$SCS$_{T2-T3}$</td>
<td>–</td>
<td>–</td>
<td>.50†</td>
<td>–</td>
</tr>
<tr>
<td>$\Delta$PCL$_{T2-T3}$</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Note. N = 73. Values used in the analyses are residualized gain scores. T1 = Time 1; T2 = Time 2; T3 = Time 3; SCS = Symptom Catastrophizing Scale; PCL = Posttraumatic Stress Checklist. **$p < .01$. 

The findings of the present study are consistent with Gellatly and Beck’s (2016) position that catastrophizing plays a role in the development and maintenance of PTSD. However, Gellatly
and Beck also propose that the relation between catastrophizing and PTSD symptoms is bidirectional; the present results did not support this bidirectionality. Whereas changes in symptom catastrophizing prospectively predicted changes in the severity of PTSD symptoms, changes in the severity of PTSD symptoms did not prospectively predict changes in symptom catastrophizing. A possible explanation for the failure to support the bidirectionality of the relation between catastrophizing and PTSD symptom severity is that the temporal relation between changes in PTSD symptoms and subsequent changes in catastrophizing might not have been captured by the study design. Measures of PTSD symptom severity and catastrophizing were only collected at three different assessment points, which were separated by 4 weeks. It is possible that the effects of PTSD symptoms on symptom catastrophizing might take place over longer periods of time than were assessed in the present study. Over time, catastrophic appraisals might evolve into enduring beliefs that are resistant to the influence of short-term fluctuations in symptom levels. Treatment gains in symptom severity might need to be maintained over an extended period of time before they are experienced as a challenge of catastrophic beliefs.

The current findings join a growing literature that shows that treatment-related changes in negative appraisals prospectively predict changes in PTSD symptom severity (Brown, Belli, Asnaani, & Foa, 2019). For example, Kumpula et al. (2017) reported that early treatment changes in negative cognitions about the self predicted late treatment changes in PTSD symptom severity in a sample of individuals with PTSD who were receiving prolonged exposure (PE) therapy. McLean et al. (2015) reported that changes in negative trauma-related cognitions mediated changes in PTSD symptoms in a sample of adolescent sexual assault victims. Similarly, Zalta et al. (2014) reported that session-to-session changes in negative cognitions were associated with later changes in PTSD symptom severity in individuals receiving PE (see also Kleim et al., 2013). To our knowledge, in all studies conducted to date, early treatment changes in PTSD symptom severity did not predict late treatment changes in negative cognitions.

Several writers have addressed the importance of targeting catastrophic thinking in the treatment of PTSD (Gellatly & Beck, 2016; Schnyder et al., 2017). The approaches to targeting catastrophic thinking described in the literature have included a host of cognitive behavioral techniques, such as education, thought monitoring, and reappraisal. However, we were unable to find a study that reported the magnitude of changes in catastrophic thinking or negative symptom appraisals achieved through the course of PTSD treatment. As such, it is unclear whether current approaches to targeting catastrophic thinking associated with PTSD are effective. In the present study, techniques specifically intended to reduce catastrophic thinking were incorporated into the behavioral activation intervention in which participants were enrolled. These techniques included education, guided disclosure, thought monitoring, reappraisal, and activity planning. Overall, participation in the behavioral activation intervention was associated with a 40.0% reduction in symptom catastrophizing. One previous study reported that changes in symptom catastrophizing of less than 30% are unlikely to impact clinical outcomes in a meaningful manner (Scott et al., 2014). The authors of a review of outcomes of the interventions used to target symptom catastrophizing in individuals with chronic pain concluded that the treatment effects reported in studies conducted to date have been
frequently modest and of questionable clinical relevance (Schutze et al., 2018). More research attention will need to be given to developing effective means of reducing catastrophic thinking in individuals with PTSD.

Some degree of caution must be exercised in the interpretation of the study findings. First, the study sample consisted of individuals who were receiving disability benefits and had been referred to an occupational rehabilitation service. These sample characteristics necessarily have implications for the generalizability of findings. Additionally, the modest sample size limited the nature of analytic procedures that could be applied to the data. In particular, it was not possible to examine possible moderators of the sequential relation between catastrophizing and PTSD symptom severity. It is also important to note that, in the absence of a control condition, it is not possible to unambiguously attribute changes in symptom catastrophizing or PTSD symptom severity to the treatment program in which participants were enrolled.

The present study also examined a specific type of catastrophic thinking, namely, symptom catastrophizing. The statements that make up the item content of the PCS (and SCS) were drawn from a pool of utterances made by participants during interviews about their pain experience (Chaves & Brown, 1978; Rosenstiel & Keefe, 1983; Spanos, Radke-Bodorik, Ferguson, & Jones, 1979; Sullivan et al., 1995). Whereas there might be conceptual grounds for distinguishing between pure cognition and pure affect, from a phenomenological perspective, the distinction is likely less clear or distinct (e.g., Damasio, 1994). Although there are emotion words in the item content of the PCS and SCS, it is important to note that the PCS has been shown to predict pain outcomes independent of measures that assess worry (Lackner & Quigley, 2005), state and trait anxiety (Sullivan et al., 1995; Sullivan, Stanish, Waite, Sullivan, & Tripp, 1998), anxiety sensitivity (Drahovzal, Stewart, & Sullivan, 2006), fear (Sullivan et al., 2009), neuroticism (Crombez, Eccleston, den Broeck, Houdenhove, & Goubert, 2002), and depression (Sullivan et al., 1998).

Although hundreds of studies using chronic pain samples have construed catastrophizing in terms of the individuals’ negative appraisals of their symptoms, research on emotional disorders has proceeded with a construal of catastrophizing in terms of negative attitudes toward the self or excessively pessimistic appraisals of the potential for negative outcomes. Research and theory on the determinants and outcomes of catastrophizing have moved forward independently in clinical and health psychology, and there are apparent conceptual and operational disparities. This domain of research will benefit from efforts to achieve consensus on the conceptual and operational definition of catastrophizing.

Despite the limitations discussed, the present findings suggest that symptom catastrophizing contributes to PTSD symptom severity independent of known correlates of PTSD such as pain and depression. The results also show that treatment-related reductions in symptom catastrophizing were prospectively related to reductions in PTSD symptom severity. A question for future research is whether symptom catastrophizing contributes to PTSD symptom severity independent of other types of maladaptive cognitions. More research is also needed to determine the most effective means of reducing catastrophic thinking in individuals with PTSD.

References


