# Do patterns of change during treatment for panic disorder predict future panic symptoms?

## Shari A. Steinman [a,*], Michael D. Hunter [b], Bethany A. Teachman [a]

[a] University of Virginia, USA
[b] University of Oklahoma, Norman, USA

## ABSTRACT

*Background and objectives:* Cognitive-behavioral therapies are currently the gold standard for panic disorder treatment, with well-documented treatment response. However, following interventions, some individuals continue to improve, while others experience a return of symptoms. The field lacks reliable ways to predict follow-up symptomatology. In the current study, a cluster analysis with a repeated measures design was conducted to examine change patterns over 12 weeks of cognitive behavioral group therapy for panic disorder. The central aim of the study was to evaluate if change patterns predict level of panic symptom severity at a six month follow-up in this sample.
*Methods:* Individuals with panic disorder ($N = 36$) completed a measure of panic symptoms (Panic Disorder Severity Scale) at the outset of every therapy session and at a six month follow-up.
*Results:* Results revealed three patterns of change in this specific trial, which significantly predicted level of panic symptoms six months post-treatment, beyond initial or final level of panic symptoms, and beyond total symptom change.
*Limitations:* Given the relatively small, lab-based sample, replications in other settings and samples will be important.
*Conclusions:* Overall, results provide initial evidence that change patterns are meaningful predictors of panic symptom severity well after the final session of treatment.

© 2012 Elsevier Ltd. All rights reserved.

Cognitive-behavioral therapy (CBT) is well-documented as the gold standard treatment for panic disorder, with approximately 74% of individuals diagnosed panic-free at the end of treatment (see Gould, Otto, & Pollack, 1995). However, in the months following CBT, some individuals continue to improve, while others experience a return of previously remitted panic symptoms or "slippage" (Gould et al., 1995; Lambert & Ogles, 2004). In fact, effect sizes for symptom change from post-treatment to six month follow-up range from −0.26, indicating slippage (Telch et al., 1993), to 0.56, indicating further gains (Öst, 1988). Currently, the field is lacking consensus on how to predict symptom levels following treatment termination.

Change patterns during therapy may be a useful way to predict panic levels in the months following CBT. Although the literature for examining change patterns and treatment trajectories in psychopathology is growing (e.g., Cuijpers, van Lier, van Straten, & Donker, 2005; Stulz & Lutz, 2007), there is minimal literature documenting the relationship between patterns of change over the course of treatment for panic disorder and panic symptoms in the months following treatment. In the current study, we use a repeated measures design to evaluate if variation in change patterns predicts level of panic symptom severity at a six month follow-up beyond total symptom change, panic level at baseline, and panic level post-treatment in a given sample.

## 1. Change patterns over the course of treatment

The majority of the literature on CBT for panic examines static values on a variable, or evaluates pre- to post-treatment change. While these methods provide valuable information about treatment efficacy, they conceal potentially significant differences in the treatment trajectory for different subpopulations of individuals (see Krause, Howard, & Lutz, 1998; Lutz, Stulz, & Köck, 2009; Stulz & Lutz, 2007). For example, two individuals may have identical beginning and ending symptom levels, but different change patterns during treatment and different follow-up levels of panic. A

---

* Corresponding author. Department of Psychology, University of Virginia, 102 Gilmer Hall, P.O. Box 400400, Charlottesville, VA 22904-4400, USA. Tel.: +1 434 243 7646; fax: +1 434 982 4766.
*E-mail address:* sas6sy@virginia.edu (S.A. Steinman).

goal of the present work is to evaluate to what extent such a difference in the change pattern during a specific treatment trial can account for differences at follow-up.

The current study uses a *k*-means cluster analytic approach (see Forgy, 1965) to examine change patterns over the course of treatment for individuals with panic disorder in a lab-based treatment study. Only a small number of studies have used cluster analytic approaches to identify patterns of change over the course of clinical interventions, such as family-based aggression prevention (Hanish & Tolan, 2001), antipsychotic treatment for schizophrenia (Lambert et al., 2009), and medication for bipolar mania (Lipkovich, Houston, & Ahl, 2008). Importantly, in Lambert et al., cluster membership predicted recovery and subjective well-being in individuals with schizophrenia at a three year follow-up, suggesting that patterns of change may have predictive value.

A few studies have examined change patterns in panic disorder, although none have used change patterns to predict follow-up levels of panic symptoms. Aaronson et al. (2008) used a repeated measures design to examine panic symptom severity levels over 11 weeks of CBT. The change patterns of treatment responders and non-responders were compared. Results indicated that 76% of treatment responders experienced a 40% reduction in panic symptom severity by the sixth week of CBT, compared to only 36% of the non-responders, suggesting that many individuals with panic who will respond to CBT will have done so by the midpoint of treatment. Stanley et al. (1996) evaluated patterns of change on levels of self-reported state fear, agoraphobia, and social fear over the course of ten weeks of treatment for panic. Change patterns were compared for individuals receiving cognitive therapy and those receiving relaxation training. Differences between the curves were evaluated, but subpopulations within treatment conditions were not explored. Finally, Clerkin, Teachman, and Smith-Janik (2008) [1] investigated rapid symptom reduction ("sudden gains") in cognitive-behavioral group therapy (CBGT) for panic, and found that sudden gains in treatment after the second treatment session predicted greater symptom reduction and change in anxiety sensitivity, relative to patients who did not experience a sudden gain. However, other change patterns over the course of treatment were not explored.

We extend this line of research by using cluster analysis to determine change patterns in a given sample, rather than comparing responders to non-responders, or comparing two different treatment conditions, or only looking at isolated changes, such as sudden gains. Additionally, we evaluate how change patterns predict level of panic at a six month follow-up. Of note, the present study does not aim to characterize all possible patterns of change that could occur in panic disorder (this would necessitate an extremely large sample and multiple treatment conditions), but rather to determine whether patterns of change can predict follow-up symptomatology beyond more standard predictors of outcome (i.e., initial and post-treatment levels of panic symptom severity) in this trial.

The field is still in the early stages of determining reliable ways to predict panic symptom level following treatment termination. Across studies, the majority of predictor variables (e.g., demographics, personality traits) have not consistently predicted follow-up symptom levels (see review by Steketee & Shapiro, 1995). As Ramnero and Öst (2004) state, "the results from this line of research have generally proven unrewarding" (p. 176). Given the predictive value of change patterns seen for psychological problems (Lambert et al., 2009), a logical next step is to evaluate if change patterns in treatment for panic disorder can predict panic symptom level at follow-up.

In the current study, we use a cluster analytic, repeated measures approach to characterize change patterns that occur over 12 weeks of CBGT for panic disorder, and then evaluate how the patterns of change predict panic level at six month follow-up (controlling separately for total symptom change, panic level at baseline, and panic level post-treatment) in this trial. Given past research emphasizing the predictive validity of change patterns, we expect that the change patterns found through the cluster analysis will significantly predict panic symptom severity six months after treatment termination. Moreover, we expect these patterns to predict follow-up beyond more commonly examined predictors of treatment outcome, including initial level, final level, and total change in symptom severity over the course of treatment.

## 2. Method

### 2.1. Participants

Participants ($N = 43$) were adults who took part in a 12-week CBGT intervention for panic disorder. To justify the term "change pattern," only participants who attended at least three of the twelve therapy sessions were included in the current study. This resulted in a final sample of 36 individuals (66.70% with agoraphobia, 69.40% female, mean age = 39.42, $SD = 15.63$, Range = 18–71). Thirty-two participants reported their ethnicity as Caucasian, two as African-American, one as biracial, and one as "other". The average total duration of panic at intake was 15.22 years ($SD = 15.86$, Range = 2 months–61 years).

Although panic disorder was the primary diagnosis for all participants (based on the Structured Clinical Interview for DSM-IV diagnoses, SCID-IV; First, Spitzer, Gibbon, & Williams, 1995), the sample had high levels of comorbidity. At intake, 58.30% of the sample had current comorbid Axis I diagnoses, including other anxiety disorders (36.1%), mood disorders (22.2%), and eating disorders (5.6%). Additionally, at intake 52.8% of participants reported current psychotropic medication use, and 8.3% reported ongoing psychosocial treatment (for issues other than CBT for panic).

Detailed descriptions of recruitment procedures can be found in Teachman, Smith-Janik, and Saporito (2007) and Teachman, Marker, and Smith-Janik (2008). Additionally, see Teachman et al. (2008) for a Consolidated Standards of Reporting Trials (CONSORT) figure, which reports data relevant to attrition and exclusion during the study's initial stages.

### 2.2. Materials[2]

#### 2.2.1. Structured intake interview

The SCID was administered to potential participants to ascertain that all participants had a primary diagnosis of panic disorder (based on symptom severity and degree of interference in functioning) and to assess Axis I comorbidity. Inter-rater reliability for the SCID diagnoses was high (kappa = 0.96) following re-rating of approximately 15% of the interviews by an independent doctoral level assessor.

#### 2.2.2. Baseline mood and anxiety measures

The *Anxiety Sensitivity Index* (ASI; Reiss, Peterson, Gursky, & McNally, 1986) is a 16-item questionnaire that assesses a person's concern about anxiety-related symptoms (e.g., "It scares me when I become short of breath"). The ASI has adequate psychometric properties (Telch, Shermis, & Lucas, 1989). In the current sample, Cronbach's alpha pre-treatment was 0.88. The *Fear Questionnaire –*

---

[1] Note, Clerkin et al. used the same dataset reported here.

[2] The materials reported here are part of a larger study assessing a range of cognitive biases in panic disorder. For a complete listing of measures, please contact the third author.