

Sudden Gains and Deteriorations in the Treatment of Posttraumatic Stress Disorder in World Trade Center Responders

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Abstract: This study sought to examine the prevalence of sudden gains and deteriorations (*i.e.*, symptom reduction/improvement during treatment) and their influence on treatment outcomes among World Trade Center responders with probable posttraumatic stress disorder. Thirty-six outpatient clients received at least three sessions of integrative psychotherapy, which included elements of psychodynamic and cognitive-behavioral therapy approaches, under routine clinical conditions. Approximately 19% of clients experienced a sudden gain and 27% of clients experienced a sudden deterioration. Those who experienced deteriorations had worse therapy outcomes compared with those who did not. Clinical implications are discussed, including the importance of routine monitoring of client treatment response for sudden deteriorations to enhance positive treatment outcomes. Future research with larger samples is needed to further evaluate the mechanisms of sudden gains and sudden deteriorations in this population.

Key Words: Posttraumatic stress disorder, sudden gains, psychotherapy, first responders, World Trade Center

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For some clients, change in symptoms during psychotherapy is not experienced in an incremental fashion (see Aderka et al., 2012). The phenomenon of sudden gains—large, sudden, and stable improvements in symptoms from one session to the next, is one such nonincremental trajectory (*cf.* Tang and DeRubeis, 1999). Sudden gains have been identified in a range of treatments for depression and anxiety disorders, including posttraumatic stress disorder (PTSD; Doane et al., 2010; Kelly et al., 2005; Tang and DeRubeis, 1999), and are often associated with short- and long-term improvements on measures of psychological, behavioral, and interpersonal functioning, after treatment, albeit not uniformly across studies (Aderka et al., 2012). To our knowledge, the mirror phenomenon of sudden deteriorations—large, sudden, and stable worsening in symptoms from one session to the next—has not garnered similar attention. However, negative changes in symptoms or functioning have often been associated with poorer outcome by the end of therapy (*e.g.*, Lambert, 2007). There is also evidence for other patterns of change, with some clients experiencing worsening of symptoms before improvement (Owen et al., 2014). Identifying within-treatment worsening and improvement patterns can aid therapists in understanding therapeutic change mechanisms (Hayes et al., 2007).

The presence of sudden gains and deteriorations is clinically meaningful in several ways. Tracking a client's symptom trajectory during treatment may allow clients and therapists to assess clients' progress and make adjustments accordingly, especially in the face of early deteriorations (Lambert, 2013) and concerns regarding elevated dropout

rates in the treatment of PTSD (*cf.* Imel et al., 2013). If clients and therapists are aware of a reduction in functioning or an exacerbation of symptoms, it may allow them to focus attention on what is going off-track in the session to make adjustments and hopefully increase the likelihood of subsequent gains. The experience of sudden gains may also increase clients' confidence in treatment, leading to improved therapeutic alliance and, subsequently, to further gains (Tang and DeRubeis, 1999).

First-responder occupations are varied, including police officers (Cardozo et al., 2005), fire fighters (Bryant and Harvey, 1995), and search and rescue personnel (Brandt et al., 1995), and are characterized by high levels of work demands (Peñalba et al., 2008) with routine exposure to both physical and psychological stressors (*e.g.*, Galloucis et al., 2000; McCaslin et al., 2006). Psychological stressors include exposure to incidents that put first responders or those around them at risk for death or severe injury (*e.g.*, backdrafts for firefighters, being attacked with a weapon for a police officer), as well as witnessing or participating in incidents where rescue involves preventing death or mitigating serious injury. Considerable research has shown that exposure to these incidents increases the likelihood of PTSD, other psychiatric disorders, and burn-out, with estimates of more than 260,000 first responders nationwide meeting criteria for full or partial PTSD (Haugen et al., 2012).

Cognitive-behavioral therapy (CBT)-oriented treatments for PTSD in varied populations have been shown to be effective (*cf.* Forbes et al., 2010); however, a recent systematic review concludes that unlike current treatment guidelines, similar levels of evidence exist in support of a treatment integrating psychodynamic and CBT techniques (brief eclectic psychotherapy for PTSD; Gersons et al., 2000) in first responders (Haugen et al., 2012). Thus, consistent with systematic reviews of PTSD (*e.g.*, Benish et al., 2008), there are multiple successful ways to treat PTSD, leaving the door open for multiple change mechanisms to assist clients, including common factors.

Sudden gains during CBT treatments of PTSD have been demonstrated for a third to half of clients; those who reported sudden gains had lower PTSD severity at posttreatment than did those who did not (Doane et al., 2010; Jun et al., 2013; Kelly et al., 2009). However, sudden gains have yet to be examined in non-CBT treatments for PTSD (Aderka et al., 2012).

The present study investigated sudden gains and deteriorations among World Trade Center (WTC) responders (our use of the title “WTC responders” references the heterogeneous grouping of both volunteers and paid professionals who provided critical services in the 9/11 terrorist attack on the World Trade Center. This group included some first responders with specialized training and/or certifications that prepared them to engage in such work. However, in the response to such a large-scale disaster, “nontraditional” first responders such as construction and utility workers, laborers, and public sector workers also provided such services. Therefore, the workers who comprised the sample in this study included both traditional and nontraditional first responders, and the functional description “WTC responders” will be used) with symptoms of PTSD receiving integrative psychotherapy under routine clinical conditions. We examined a) the prevalence of sudden gains and deteriorations and b) short-term treatment outcomes comparing clients with and without sudden gains and sudden deteriorations. Specifically, we expected sudden gains and deteriorations to be consistent with the prevalence rates of previous literature (*e.g.*,

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approximately 10%–25%). We also hypothesized that sudden gains would be positively related to therapy outcomes and sudden deteriorations would be negatively related to therapy outcomes.

METHODS

Participants

Participants were 36 WTC responders ($n = 32$ men and $n = 4$ women), with a mean (SD) age of 48.2 (9.88) years, receiving treatment through a 9/11-specialty clinic in New York City. Most of the clients identified as European American (56.8%, $n = 21$), “other” (16.7%, $n = 6$), African American (16.2%, $n = 6$), and Latino/Hispanic (5.4%, $n = 2$). At the time of the study, most participants were retired or unemployed (53.8%, $n = 19$), with the remainder being employed (47.2%, $n = 17$). The largest occupational group was law enforcement workers (22.2%, $n = 8$), followed by engineers (11.1%, $n = 4$) and construction workers (8.3%, $n = 3$), with each of the remaining occupations (e.g., health care workers, telecommunication workers) representing no more than 5.6% ($n < 3$ per remaining occupations) of the total sample. The mean length of time between September 11, 2001, and the first psychotherapy session was approximately 10 years (mean [SD], 3644.61 [422.26] days). The clients were treated by 11 therapists: 5 with PhDs in clinical psychology and 6 doctoral-level graduate students. All treatments were supervised by one of two senior clinical psychologists. A minority of participants (39%) were also in concurrent pharmacotherapy. Consistent with data from epidemiologic surveys, most participants were diagnosed with two or more anxiety or mood disorders (e.g., Brady et al., 2000).

Treatment

Clients engaged in integrative psychotherapy on a weekly basis. The mean (SD) treatment length was 18.58 (15.65) sessions. The treatment integrated elements of psychodynamic and CBT approaches, using psychodynamic metapsychology but including a more active therapeutic stance than most psychodynamic therapies (see Haugen et al., 2013). To assess early treatment adherence, all therapists rated their activity using the Comparative Psychotherapy Process Scale (CPPS; Hilsenroth et al., 2005) for the third psychotherapy session. For the current sample, the mean (SD) CPPS–Psychodynamic-Interpersonal (PI) scale score was 3.49 (1.32), and the mean (SD) CPPS–Cognitive-Behavioral (CB) scale score was 3.05 (1.32), indicating similar amounts of PI and CB activities and adherence to an integrative treatment approach. For most clients, the primary treatment goal was to assist them in coming to terms with the meaning of the event to which they had been exposed. When comorbid disorders were present, additional phases or techniques were added to the treatment plan based on the approach outlined in *Assessment Based Treatment of Post Traumatic Stress Disorders* (Horowitz, 2011).

Procedure

Participants were adult patient WTC responders who had partial or full PTSD related to their direct exposure to the events of 9/11, at the WTC, or in the subsequent rescue and recovery efforts. They were admitted for individual psychotherapy at an outpatient clinic treating exclusively WTC responders in New York, NY. Data were obtained from consecutive patients, admitted after November 1, 2009, and completing treatment before July 18, 2013.

Individuals were eligible for inclusion only if they a) were a WTC responder who met WTC Health Program guidelines for WTC-related psychiatric condition, b) met criteria for a full or partial diagnosis of PTSD (*Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision [DSM-IV-TR]*; APA, 2000; for calculation of partial PTSD, see procedures) with moderate to severe symptoms as indicated on the PTSD Checklist–Specific Version (PCL-S;

Weathers et al., 1993), c) were 18 years or older, and d) had English fluency. Individuals were excluded if they had a) organic brain damage, b) mental retardation, c) suicidal or homicidal ideation posing imminent danger, d) current substance dependence, and/or e) psychological treatment within 6 weeks of enrollment date. Patients with a history of substance use or presence of suicidal thoughts were not excluded. Exclusion criteria were assessed by interview. No participants were excluded. All patients completed the PCL-S before their first treatment session and the Outcome Questionnaire-45.2 (OQ-45.2; Lambert and Ogles, 2004) before their first treatment session and each subsequent session. [All procedures in this study were approved by the NYU School of Medicine Institutional Review Board (R#: 11-01413).] Consistent with psychotherapy studies in naturalistic settings, we used the OQ-45.2 that was completed before their first session as the pretreatment score and clients' last session score as the posttreatment score. There were no follow-up assessments.

Measures

Outcome Questionnaire-45.2

The OQ-45.2 (Lambert and Ogles, 2004) is a client-rated measure of psychological distress (Lambert and Hawkins, 2004). The 45 items are rated on a Likert scale, ranging from 0 to 4, with higher scores indicating more distress. Test-retest coefficients have ranged from 0.66 to 0.86, and Cronbach's alphas have been shown to be greater than 0.90 in a variety of samples (Lambert and Hawkins, 2004; Lambert et al., 1996). In addition, the OQ-45.2 has demonstrated significant associations with a range of other psychological distress and well-being measures (Lambert et al., 1996). In this sample, the alpha was 0.94.

PTSD Checklist–Specific Version

The PCL-S (Weathers et al., 1993) is a 17-item patient-rated measure of PTSD symptoms, largely based on *DSM-IV-TR* criteria (APA, 2000). Using a Likert Scale from 1 (not at all) to 5 (extremely), patients assess the degree to which they have been bothered by a particular symptom within the past month. The PCL-S was completed for the specific traumatic event of 9/11 in this study at the beginning of treatment. Consistent with *DSM-IV-TR* (APA, 2000) criteria, partial PTSD was defined as one or more symptom in each of three symptom groups (criteria B, C, and D) and duration of 1 month or more. A symptom was considered present or absent using criteria delineated by Yarvis et al. (2005): A symptom criterion was met if patients indicated being bothered by it at least “a little bit” (i.e., 2 on the 5-point Likert scale). The mean length of time between September 11, 2001, and the administration of the PCL-S was approximately 10 years (mean [SD], 3691.61 [608.07] days). In this sample, the alpha was 0.93.

Criteria for Sudden Gains and Sudden Deteriorations

First, sudden gains were defined as clinically significant reductions in symptoms between any session N and session $N + 1$ (see Tang and DeRubeis, 1999). Thus, only those reductions of at least 14 points on the OQ-45.2 were identified for consideration as sudden gains (Anderson and Lambert, 2001). Second, the magnitude of the gain must have been large, representing a reduction of at least 25% of the pregain session symptom severity score. Third, the gains must be large—greater than the reliable change index (Jacobson and Truax, 1991) of the OQ-45.2—relative to symptom fluctuations before and after the gain. Thus, we compared the mean score of three pregain sessions with the mean score of the gain session and two postgain sessions to assess for significant differences in the means. Sudden gains occurred when all three conditions described above were met. The third criterion makes it impossible to evaluate changes occurring between the first and second sessions. Therefore, to identify very early sudden gains, we adopted the criteria of Gaynor et al. (2003) (there were five patients who had

TABLE 1. Means and Standard Deviations for SG and NSG Participants and SD and NSD Participants Across Time Points

	SG (n = 7)		NSG (n = 29)		SD (n = 19)		NSD (n = 27)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
OQ-45.2	83.65 (18.75)	72.15 (35.11)	76.60 (24.51)	72.63 (23.22)	73.45 (19.42)	82.64 (27.66)	79.48 (24.77)	69.17 (24.14)
PCL-S	56.71 (14.28)	–	55.03 (12.10)	–	53.22 (10.21)	–	56.07 (13.09)	–

SG indicates sudden gain; NSG, non-sudden gain; SD, sudden deterioration; NSD, non-sudden deterioration.

missing first-session OQ-45.2 scores. We imputed those scores based on their PCL-S score. The correlation between OQ-45.2 first session and PCL-S was $r = 0.78$ $p < 0.001$, which states that for first session sudden gains, 50% of the gains must have been maintained for two sessions. Calculation of sudden deteriorations was identical to those for sudden gains with the sole exception of the direction of the symptom change (e.g., decrease of 14 points for sudden gain versus an increase of 14 points for sudden deterioration).

Within the current study, although therapists were aware of clients' OQ-45.2 scores from session to session and were free to discuss these scores with patients, sudden gains or deteriorations were not identified as such during treatment.

RESULTS

The mean (SD) pre- and post-OQ-45.2 scores for these 36 clients were 77.97 (23.43) and 72.53 (25.35), respectively (range of change, -43.50 to 54.96). We found no difference between clients with sudden gains or sudden deteriorations and other clients in terms of baseline demographics, PCL-S scores, or pre-OQ-45.2 scores (p values > 0.05 ; Table 1). Seven of the 36 clients experienced a sudden gain (18.9%). Nine of the 36 clients experienced a sudden deterioration (27%). Those who experienced sudden gains had improvements in symptoms from the beginning to the end of treatment (pre-session to post-session scores; $M_{\text{change}} = 16.90$; 95% confidence interval [95% CI], 4.45–30.49; $p = 0.07$). Sudden deteriorations were associated with no meaningful change of symptoms from pre to post ($M_{\text{change}} = 2.07$; 95% CI, -11.98 to 14.29; $p = 0.78$).

Next, we examined whether sudden gains or deteriorations were associated with therapy outcomes. We conducted a linear regression where we predicted OQ-45.2 last-session score by sudden gain (yes = 1, no = 0), sudden deterioration (yes = 1, no = 0), after controlling for OQ-45.2 pre-session score and number of sessions. The results demonstrated that sudden gains were not significantly associated with higher levels of psychological distress; however, sudden deteriorations were (see Table 2). Clients who experienced a sudden deterioration had worse outcomes as compared with those who did not, as evidenced by a medium-sized effect (Cohen's $d = 0.38$). As for the control variables, OQ-45.2 pre-session scores were a significant predictor of OQ-45.2 post-session scores, which is to be expected.

DISCUSSION

This study examined sudden gains and deteriorations during treatment among WTC responders who were experiencing PTSD symptoms and receiving integrative psychotherapy. We found that sudden gains occurred among 18.9% of clients; however, these gains were not associated with treatment outcome, for example, increased psychological distress. This rate is roughly consistent with those reported in other studies using naturalistic samples. Sudden deteriorations were found at rates comparable with sudden gains (27%) and were related to worse psychological distress; these rates are slightly elevated in comparison with other studies with naturalistic samples (e.g., 5%–14%; Lambert and Shimokawa, 2011). Similar responses in early treatment (sessions 1–3) in other literature have been shown to account for 40% of final outcome variance (Brown and Lambert, 1998).

There are several potential explanations for the association between sudden deteriorations and outcome. Sudden deteriorations may represent a “downward spiral” whereby increased symptoms and worsened alliance interact with each other in a feedback loop, which, if not interrupted, can lead to further deterioration (Lambert and Hawkins, 2004). Tang and DeRubeis (1999) have suggested that sudden gains in CBT are achieved via straightforward techniques such as questioning automatic thoughts, and these sudden gains mark the beginning of a “positive feedback loop” by which cognitive changes and sudden gains lead to improved alliance and symptom reduction (i.e., “upward spiral”). What interventions or lack thereof are linked to the downward spiral is unknown, yet there might be some priming of negative thought processes that, if not interrupted, may fuel more symptomatic deteriorations. In psychodynamic approaches, sudden gains are thought to stem from client-insight associated with accurate therapist interpretations in the pre-gain session (Andrusyna et al., 2006). Thus, it is plausible that inaccurate or mistimed interpretations could overwhelm clients' defenses to the point of increased symptoms. Assessing the frequency and timing of prototypic CBT and psychodynamic interventions in this integrative treatment, although beyond the scope of this study, may shed additional light on the processes by which sudden gains are (or, are not) associated with short-term outcomes.

There are also several factors, organizational and individual, specific to first responders that for some might serve as barriers to treatment (see Hoge et al., 2004, for a discussion of this issue in military populations) and/or result in early, sudden deterioration. Responders may experience concerns regarding the potential for negative evaluations by peers and/or leadership in connection with their psychiatric condition, which in turn might lead to negative changes in job duties or reduced pay (e.g., Deisinger, 2003). This may result in poor initial expectations regarding psychotherapy, leading to increased probability of negative therapy outcomes. Future research should empirically evaluate the relationship of expectations and outcome in this population.

Clinical Implications

In the treatment of WTC responders, similar to other populations, it is important to monitor and attend to sudden deteriorations, through the use of client feedback tools (e.g., OQ-45.2), thereby allowing therapists to refine or reconsider their existing treatment approach and directly intervene at the level of clients' symptom distress.

TABLE 2. Summary of Linear Regression Predicting OQ-45.2 Post-session Score (N = 36)

	<i>b</i>	SE	β
Sudden gain	-10.60	8.49	-0.17
Sudden deterioration	17.77	7.23	0.31*
Pre-OQ-45.2	0.70	0.14	0.65**
Session	0.30	0.22	0.18

* $p < 0.01$.
** $p < 0.001$.

This may include shifting the relative dosage of CBT versus psychodynamic interventions, supplementing the therapy with additional support, reassessing the client's goals and engagement in therapy, and/or exploring possible alliance ruptures (Lambert, 2013). Future research efforts should also focus on examining the relationship between psychotherapy techniques and sudden deteriorations, to provide additional insight into techniques that may promote or attenuate sudden deteriorations with this population.

Limitations

Potential limitations regarding these findings should be considered. First, the different influence of sudden changes on outcome may stem from the nature of the sample and setting: this study included clients who had fewer sessions than many (including dropouts/premature terminations), therefore potentially receiving an insufficient "dose" of treatment to detect effects. Other features of naturalistic samples, such as less stringent client selection criteria, more flexible (e.g., nonmanualized) application of treatment protocols (i.e., single measures of self-report to assess patient symptom reduction and psychological distress, variable treatment length, lack of structured diagnostic interview), and the possibility of lower levels of mean effectiveness of treatments, may have been limiting factors. Moreover, other outside factors such as clients' concurrent pharmacological treatment may be a potential unmeasured source of influence contributing to the experience of discontinuous change (see Jun et al., 2013, for a discussion of sudden gains in prolonged exposure and sertraline treatments for PTSD). In addition, there is limited statistical power associated with our small sample size, which was composed entirely of WTC responders exposed to the rescue and recovery effort after the 9/11 terrorist attacks. We were also not able to measure PTSD symptom change after treatment. Whether these findings can be extended and replicated within other populations of PTSD is unknown, yet these limitations may represent features of routine treatment conditions.

This study is among the first to examine the prevalence of sudden gains and sudden deteriorations in an integrative psychotherapy for PTSD. Our findings yielded 18.9% of clients who experienced a sudden gain, whereas 27% of clients experienced a sudden deterioration, which were associated with worse therapy outcome. Clinical recommendations include routine outcome monitoring, with particular attention paid to the occurrence of sudden deteriorations. This work should be replicated within larger populations and varied psychotherapy modalities to further examine the complex nature of change in psychotherapy. Solely examining the total sample in any study will likely mask the realities of psychotherapy and will ultimately not speak to the experience of many clients and therapists.

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DISCLOSURES

The authors declare no conflict of interest.

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