

# Sudden Gains During Patient-Directed Expressive Writing Treatment Predicts Depression Reduction in Women with History of Childhood Sexual Abuse: Results from a Randomized Clinical Trial

Tierney A. Lorenz · Carey S. Pulverman ·  
Cindy M. Meston

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**Abstract** Sudden gains are large reductions in symptoms measured in a single between-session interval and are positively associated with long-term treatment outcomes. To date, sudden gains have mostly been observed in therapist-directed psychotherapies. There are currently mixed findings surrounding the mechanisms underlying sudden gains, with some support for a cognitive mechanism and some support for therapist characteristics such as the therapeutic alliance. In this study of 77 female survivors of childhood sexual abuse, sudden gains in trauma symptoms were found in a randomized clinical trial of a patient-directed expressive writing intervention. Women in the active treatment condition (who wrote about their beliefs related to sexuality or trauma) exhibiting sudden gains in trauma symptoms showed larger improvements in depression than those in the control condition (who merely wrote about their daily needs). The extension of sudden gains from psychotherapy to a client-directed treatment refines our understanding of the mechanisms underlying these gains, and supports the hypothesis that cognitive change is a likely mechanism underlying sudden gains.

**Keywords** Sudden gains · Expressive writing · Childhood sexual abuse · Psychotherapy · Cognitive · Schema

## Introduction

Despite the commonly held belief that symptom change through therapy is gradual, for many patients, improvement occurs at an uneven pace marked by short bursts of great improvement. Sudden gains are defined as large reductions in symptoms in a single between-session interval. The criteria for sudden gains, first proposed by Tang and DeRubeis in 1999, require the gains to be substantial in absolute terms, relative to symptoms before the gain, and relative to symptom fluctuations both preceding and following the gain. These criteria ensure that the sudden gains are, indeed, a substantial change rather than an artifact of symptom fluctuation or natural improvement over time. Sudden gains have been shown to account for over half of total symptom reduction throughout the course of therapy for some clients (Tang and DeRubeis 1999), and predict many treatment benefits including better long-term outcomes (Hardy et al. 2005; Tang and DeRubeis 1999; Tang et al. 2005) and a lower risk of relapse (Tang et al. 2007). Sudden gains have been illustrated in both controlled randomized clinical trials and routine clinic conditions (Stiles et al. 2003).

Research on sudden gain has contributed to the study of therapy efficacy. The content of the pre-gain or “critical” treatment session (the session immediately prior to the sudden gain) has been used to examine the active mechanisms underlying the process of change in therapy (Andrusyna et al. 2006; Tang and DeRubeis 1999; Tang et al. 2005). Although sudden gains were first demonstrated in cognitive behavioral therapy for depression (Tang and DeRubeis 1999; Tang et al. 2005), they have since been shown to occur in treatment for other disorders (e.g., Kelly et al. 2009), and with other types of therapy including supportive-expressive therapy (Andrusyna et al. 2006; Tang et al. 2002), systemic behavioral family therapy, and nondirective supportive therapy (Gaynor

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T. A. Lorenz (✉) · C. S. Pulverman · C. M. Meston (✉)  
Department of Psychology, University of Texas at Austin,  
108 East Dean Keeton Street, Austin, TX 78712, USA  
e-mail: tierney.lorenz@gmail.com

C. M. Meston  
e-mail: meston@psy.utexas.edu

et al. 2003). To date, research has been focused on examining sudden gains in the context of therapist-administered therapy but it is possible that sudden gains might also occur during self-directed treatments such as expressive writing.

In expressive writing treatments clients complete several sessions of writing about emotional topics over a period of weeks or months. Expressive writing has been shown to be efficacious for a variety of both physical and mental health outcomes including a reduction in depressive symptoms (Koopman et al. 2005), lower psychological distress (Frataroli 2006), and increased immune system functioning and improvements in overall physical health (Smyth 1998). Researchers have administered expressive writing paradigms as a self-directed treatment for a variety of specific traumatic experiences including breast cancer (Gellaitry et al. 2010; Henry et al. 2010), testicular cancer (Pauley et al. 2011), heart attack (Willmott et al. 2011), kidney transplant (Possemato et al. 2010), and intimate partner violence (Koopman et al. 2005). Expressive writing interventions are an innovative treatment approach because they offer an easily administered and low cost route to improved mental health. Self-directed treatments also have the advantage of allowing the client to move through the treatment at their own pace rather than forcing them to adhere to a standardized treatment schedule.

In the present study, we examined whether sudden gains occur in an expressive writing intervention in order to help elucidate the active mechanisms underlying sudden gains. Currently there is mixed evidence for the treatment elements that produce sudden gains. Studies of cognitive behavioral treatments for depression have identified cognitive change in the pre-gain session as the active precursor to sudden gains (Tang and DeRubeis 1999; Tang et al. 2005). Yet sudden gains have also been found in studies of supportive-expressive therapy, suggesting that cognitive change (not a central component of SE therapy) may *not* be a sufficient explanation for sudden gains (Andrusyna et al. 2006; Tang et al. 2002). Rather these studies proposed non-specific aspects of therapy such as the therapeutic alliance (Tang et al. 2002), or therapist interpretation accuracy (Andrusyna et al. 2006) as the active mechanisms producing sudden gains. Examination of sudden gains in a treatment in which the therapist plays a minimal role, such as expressive writing, could help tease apart these competing explanations. If the therapeutic alliance is essential for sudden gains, then we would *not* expect to observe sudden gains with a client-directed treatment.

To our knowledge, the majority of studies to date have only examined sudden gains within the context of therapist-guided treatments, with only one study examining client-directed treatments (Kelly et al. 2009). In this study we tested for sudden gains in a client-directed intervention to help explicate whether the therapist is a key factor in producing sudden gains. We examined sudden gains within

a 5-session expressive writing treatment for female survivors of childhood sexual abuse (CSA) experiencing symptoms of depression. Based on past literature which indicates that sudden gain responders show greater symptom reduction (Tang and DeRubeis 1999; Tang et al. 2005) we predicted that, if sudden gains occurred with this type of intervention, participants who showed sudden gains between sessions would have better treatment outcomes than those whose pattern of improvement was more gradual. Based on past research indicating that sudden gains are initiated by cognitive change in the pre-gain session (Tang and DeRubeis 1999; Tang et al. 2005) we predicted this effect would be stronger for women in an active treatment condition targeting cognitive change relative to the control condition; that is, we predicted that cognitive change would be the mechanism through which sudden gains in trauma symptoms would impact depression.

In this study cognitive change was measured with a validated measure of sexual self-schema (SSSS; Andersen and Cyranowski 1994). Broadly, schema are comprehensive cognitive frameworks that organize information and attitudes, orient attention and processing, and guide behavior for an individual. Sexual self-schema guide attitudes and behaviors related to one's sexuality and have been shown to differ in women who do and do not have a history of CSA (Meston et al. 2006). Specifically, women with a history of CSA tend to have more negative sexual self-schema (Meston et al. 2006; Niehaus et al. 2010) which are associated with low self-esteem and viewing the self as immoral or irresponsible (Niehaus et al. 2010). Additionally, negative sexual self-schema are associated with poorer functioning in intimate relationships for women with a history of CSA (Cyranowski et al. 1999). We predicted that sudden gains would be associated with change in sexual self-schema.

Thus, our hypotheses were as follows:

1. Sudden gains in trauma symptoms in between sessions would be associated with greater improvement in depression pre-post treatment.
2. Sudden gains in trauma symptoms would be associated with greater improvements in depression in the active treatment condition (writing about beliefs regarding sexuality and trauma) as compared to the control condition (writing about daily needs).
3. Change in sexual cognitions (i.e., sexual self-schema) would mediate the effect of sudden gains in trauma symptoms on pre-post treatment changes in depression.

## Methods

The data for the present analyses were taken from a clinical trial of expressive writing reported elsewhere; see Meston

et al. (under review) for a full description of the treatment protocol, and see Harte et al. (in press) for description of participant attrition. As the present study was a secondary analysis of data previously collected, it was post hoc to the initial treatment design; however, before conducting tests we made the directional hypotheses listed above.

### Participants

We recruited women with adult sexual problems related to a history of CSA for a clinical trial of expressive writing treatment. We advertised the study online and in local newspapers, recruiting women with a history of unwanted sexual contact in childhood and who were interested in psychological treatment for sexual or intimate relationship problems. Interested participants completed a telephone screening. Women meeting criteria were then scheduled for an initial intake, in which eligibility was confirmed via clinical interview. Inclusion criteria included: at least 18 years old, at least one experience of CSA before age 16 (defined as “unwanted oral, anal, or vaginal intercourse, penetration of the vagina or anus using objects or digits, or genital touching or fondling”), experiencing some psychosexual difficulty (including sexual dysfunction, distress, or low sexual satisfaction), and currently in a relationship or sexually active. Exclusion criteria included: concurrent psychotherapy for sexual or abuse-related issues, current suicidal or homicidal ideation, current untreated psychosis or diagnosis of psychosis in the last 6 months, current substance abuse, sexual assault or abuse within the previous 2 years, or other traumatic experience within the last 3 months. Women taking psychoactive medications were permitted in the trial if they had been stable on that medication and dose for at least 3 months prior to enrollment; women who had previously sought treatment for abuse-related problems were permitted as long as they reported no current psychotherapy.

A total of 127 participants were enrolled in the trial, of which 99 completed all treatment sessions and both the pre and post-treatment follow-up assessments. In-session data were not available for 22 women, leaving 77 ( $M_{age} = 37.24$ ,  $SD = 10.83$ ) participants with complete data in all measures analyzed here. Demographic variables are presented in Table 1.

### Measures

#### *In-Session Symptom Screener*

At the beginning of each session, participants completed a brief 4-item inventory of symptoms relevant to traumatic stress (negative emotion, intrusiveness of traumatic memories, suicidality, and engagement with or avoidance of social support; see <http://bit.ly/wKzXT8> for full text). This measure was

**Table 1** Patient demographics

	<i>n</i>	%
<i>Race/ethnicity</i>		
White	46	60
Hispanic	16	21
Black	4	5
Other	7	9
Data missing	4	5
<i>Sexual orientation</i>		
Heterosexual	50	66
Bisexual/neither hetero nor homosexual	17	22
Lesbian	5	6
Data missing	5	6
<i>Relationship status</i>		
Single	15	19
Dating/casual relationship(s)	7	9
Long-term relationship(s) or married	51	67
Data missing	4	5
<i>Education</i>		
Some high school or less	1	1
High school/G.E.D.	8	10
Some college/4 years degree	53	69
Advanced degree	12	16
Data missing	3	4
<i>Abuse characteristics</i>		
Non-penetrative only	13	17
Oral or vaginal penetration	57	74
Data missing	7	9

originally developed as a brief screener to assess if that day’s writing session put participants at risk; participants indicating significant distress or suicidality related to the study protocol were identified to research administrators with this measure. As the pre-treatment check-in was to be as brief as possible, this was the only measure given at each writing session. After the study was completed, we decided to use this measure to examine the question of sudden gains in expressive writing.

Total scores on the in-session symptom screener could range from 0 to 18, with higher scores indicating greater trauma symptoms. This measure demonstrated adequate internal consistency ( $\alpha = .676$ ). Scores from the first administration of this measure were significantly, albeit moderately, correlated with total scores on the pre-treatment Clinician Administered PTSD Scale,  $r(68) = .241$ ,  $p = .048$ , suggesting convergent validity.

#### *Pre and Post-treatment Endpoint Measures*

The following assessments were administered in the pre- and post-treatment assessment sessions, which took place during the week before and after treatment, respectively.

*Beck Depression Inventory-II (BDI-II; Beck et al. 1996)*

The BDI-II, our primary outcome measure, is a widely used, extensively validated measure of depression symptoms (Beck et al. 1988). Higher scores are indicative of higher depression. In the present sample, the BDI-II demonstrated excellent reliability ( $\alpha = .893$ ).

*Clinician Administered PTSD Scale (CAPS; Blake et al. 1995)*

The CAPS is a validated structured interview for the criteria for post-traumatic stress disorder as described in the Diagnostic and Statistical Manual-IV-TR (American Psychiatric Association 2000). We used data from the pre-treatment CAPS to establish validity of the in-session treatment measure; however, CAPS data were missing for approximately 38 % of the sample reported here, and thus it was not used as a treatment outcome metric.

*Sexual Self-Schema Scale (SSSS; Andersen and Cyranowski 1994)*

The SSSS was developed to capture women's beliefs and attitudes regarding their sexuality; we included this measure to assess whether cognitive changes were the mechanism through which sudden gains in trauma symptoms caused changes in depression in our sample. The SSSS consists of 26 adjectives, embedded in a list alongside 24 filler words, which participants are asked to rate as descriptive of them or not. The total score represents a cognitive tendency towards passionate-romantic thoughts and feelings, openness to sexual experience, and lack of embarrassment or conservative sexual attitudes. Convergent validity was established using measures of sexual attitudes and sexual guilt, and discriminant validity to measures of extraversion and self-esteem (Andersen and Cyranowski 1994). The SSSS demonstrated acceptable reliability in the current sample ( $\alpha = .603$ ).

**Procedure**

Participants were given information about the study sufficient to provide informed consent. They completed a pre-treatment assessment battery including the BDI-II, CAPS and SSSS as well as other measures not reported here (see Meston et al. under review). There were separate research staff for assessment sessions and treatment sessions, and thus assessors were blinded to participant's treatment condition (i.e., there was a double-blind). Participants were randomized to treatment condition just before the first treatment session by the research administrator

administering the treatment prompts (see below); randomization was assigned according to a pre-generated list matching participant number to randomly ordered conditions. Women in the control group ( $n = 24$ ) did not differ from those in the active treatment group ( $n = 53$ ) in terms of age ( $t(40.985) = .882, p = .383$ ), ethnicity ( $\chi^2(3) = 2.384, p = .497$ ), education ( $\chi^2(3) = 1.266, p = .737$ ), sexual orientation ( $\chi^2(2) = .439, p = .803$ ), severity of abuse ( $\chi^2(1) = .366, p = .545$ ), or pre-treatment level of depression ( $t(47.018) = .457, p = .650$ ).

All participants met with a master's level clinical psychology graduate student trained in safety assessment serving as a research administrator for 5 treatment sessions. The role of the research administrator was to instruct the participant as to the writing prompt, and to assess for potential risk of harm following each writing session; they did not provide any known active psychotherapeutic technique.

Treatment sessions were paced at the participant's discretion, with no more than 2 sessions per week. Most participants elected to meet once per week. Participants wrote about their assigned topic continuously for 30 min in each session. They wrote on a computer, and were instructed to close their essays at the end of the 30-min period to ensure confidentiality. After the study was completed, these essays were verified for compliance with treatment prompts; no essay was found to be noticeably off-prompt (for more detail, see Lorenz and Meston 2012).

The three writing conditions were identical except for the content of the prompt; full prompts are available at <http://bit.ly/wKzXT8>. The two active treatments included either standard expressive writing prompts focusing on a traumatic experience (adapted from Pennebaker 1989), or prompts focusing on schema related to sexuality. This latter condition was developed to target negative beliefs about sexuality common to survivors of sexual trauma (Meston et al. 2006; Niehaus et al. 2010), as well as evidence for and against those beliefs. Control treatment prompts instructed participants to write about their needs over the past 24 h in as much detail as possible (adapted from time management condition of Pennebaker (1989) to increase believability as a possibly active treatment). Participants were ensured their writing would be kept anonymous and did not receive any feedback on their writing (Pennebaker and Chung 2011).

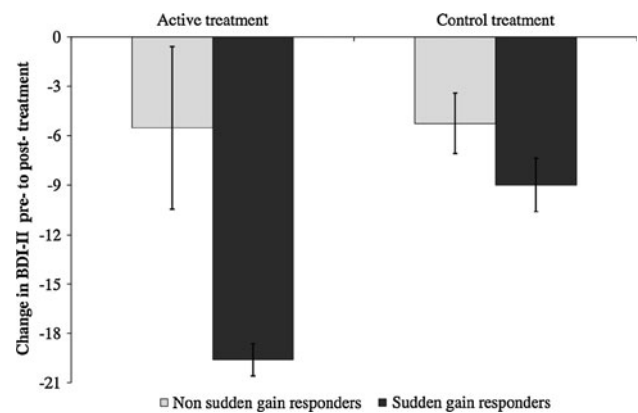
Finally, within 1 week of completing the treatment, participants attended a post-treatment assessment session identical to the pre-treatment assessment. All study procedures were approved by the Institutional Review Board at the University of Texas at Austin for the duration of the data collection and analyses (2005–2012).

## Results

We first categorized participants as sudden gain responders or non-sudden gain responders. Tang and DeRubeis (1999) noted that a sudden gain must be large in absolute terms, relative to the symptom severity before the gain, and relative to fluctuations following the gain. Thus, we classified sudden gains in the in-session trauma screener survey as those changes between sessions that fit the following criteria: (1) equal or greater than the average change across all sessions ( $M = 1.159$ ) plus one standard deviation ( $SD = 3.199$ ), i.e. at least 4.359 points; (2) representing at least 25 % of the pregain session score; (3) not followed by any subsequent increase larger than 25 % of the total item score.<sup>1</sup> Following these criteria there were 10 sudden gain responders. Sudden gain responders did not differ from non-sudden gain responders in terms of age ( $t(12.250) = .477$ ,  $p = .642$ ), ethnicity ( $\chi^2(3) = 5.785$ ,  $p = .123$ ), education ( $\chi^2(3) = 2.452$ ,  $p = .484$ ), sexual orientation ( $\chi^2(2) = 5.534$ ,  $p = .063$ ), severity of abuse ( $\chi^2(1) = .632$ ,  $p = .427$ ), or pre-treatment level of depression ( $t(13.300) = .658$ ,  $p = .522$ ). Sudden gain responders had significantly greater improvement in positive sexual self-schema than non-sudden gain responders, ( $t(10.065) = 2.461$ ,  $p = .034$ ,  $d = 1.55$ ).

We then conducted an analysis of covariance (ANCOVA) with pre-post change in BDI scores as the dependent variable, sudden gain status and treatment condition as fixed factors, and change in sexual self-schema as a covariate. We constructed the model to include the three-way interaction between sudden gain status, treatment condition, and change in sexual self-schema, as well as all constituent terms. Both of the active treatments targeted cognitive change (differing in the types of beliefs targeted, either trauma-related or sexuality-related); thus, we collapsed these into one “active treatment” group (compared against the control group).

The interaction between sudden gain status, treatment condition, and change in sexual self-schema was not significant. Dropping this term, we found that the interaction between sudden gain status and condition was significant, ( $F(1, 74) = 6.526$ ,  $p = .013$ ,  $d = .465$ ), such that women who were in an active treatment condition who experienced a sudden gain in the in-session screener survey had the largest improvement in BDI-II scores from pre- to post-treatment (see Fig. 1). There was also a significant interaction between sudden gain status and change in sexual self-schema, ( $F(1, 74) = 5.134$ ,  $p = .027$ ,  $d = .412$ ). Follow-up tests revealed that increases in positive sexual self-schema were associated with improvement in BDI-II scores for the non-sudden gain



**Fig. 1** Interaction of treatment condition and sudden gain status on change in depression pre to post treatment

responders ( $r(67) = -.490$ ,  $p = .0001$ ,  $R^2 = .240$ ), while for sudden gain responders, this relationship was not significant ( $r(8) = .304$ ,  $p = .464$ ,  $R^2 = .092$ ).

## Discussion

Our findings suggest that sudden gains can predict symptom improvement in self-directed psychological treatments. Specifically, in the active expressive writing treatment conditions, women who had sudden gains in the in-session trauma symptom screener showed greater pre-post treatment improvements in depression symptoms than women who did not have sudden gains. There was no difference between sudden gain responders and non-sudden gain responders in the control condition, suggesting that the effect of sudden gains is specific to treatments targeting cognitive changes. Most likely, change in the control group was due to spontaneous improvement, which is a common placebo response in depression treatments (Rutherford et al. 2012). Finally, we found that sudden gain responders had a greater change in sexual self-schemas.

It is possible that client-directed treatments with minimal therapist involvement follow the same principles of dynamic, non-linear progress as traditional forms of therapist-guided treatments. Moreover, our findings further support the hypothesis that the critical element of sudden gains is cognitive change and not changes in the relationship with a therapist. Measures of therapeutic alliance tend to change in sessions following sudden gains, not before (Strunk et al. 2010; Tang and DeRubeis 1999), suggesting that this shift is a consequence, not cause, of the sudden gain. Our results with a client-directed treatment with very limited contact with research administrators (let alone alliance with a therapist) imply that improvements in therapeutic alliance may be helpful, but not be necessary, to produce sudden gains. A similar study showed that

<sup>1</sup> Tang and DeRubeis (1999) and subsequent replications of their design stipulate all sudden gains must be stable across the next three sessions; however, given that our therapy was limited to five sessions, we adapted this requirement to fit the original conceptual intent.



sudden gains in PTSD-related measures were associated with lower depression severity post-treatment (Kelly et al. 2009). In the Kelly et al. study, there was no difference in the impact of sudden gains on patients who wrote accounts of their traumatic experiences and were directly guided in cognitive restructuring by a therapist, and those who simply wrote their accounts and read them to the therapist. Here again, it seems that the essential element is the patient-directed change in cognitions. Recent meta-analyses on sudden gains in treatments for anxiety and depression have shown that effect sizes on outcome measures in cognitive treatments are greater than that seen in non-cognitive treatments (Aderka et al. 2012).

Counter to predictions, however, we did not find that changes in sexual self-schema predicted changes in depression symptoms for women who had sudden gains in the in-session trauma symptom screener. This may be because all but one sudden gain responder showed improvement in sexual self-schema, limiting the variance in which a significant relationship could be observed. Indeed, in non-sudden gain responders (for whom there was a larger range of outcomes in change in sexual self-schema), there was a significant association between improvement in sexual self-schema and reductions in depression. Also, there were no differences between active and control conditions in the impact of sudden gains on change in depression, suggesting that cognitive changes had a similar impact on depression regardless of the conditions in which they occurred. When considered together with the finding that sudden gain responders showed significantly greater improvement in sexual self-schema, it provides support for the notion that cognitive change was key in the positive treatment outcomes seen with our expressive writing treatment.

Significant limitations to this study include the use of a non-validated measure of trauma as our index for sudden gains and the use of sudden gain in one factor (trauma) to predict change in another factor (depression). Ideally, these results would be replicated using a validated symptom measure (e.g., depression) administered at each session to assess both sudden gains and predict pre-post change within the same factor as in Tang and DeRubeis (1999). However, given the strong relationship between traumatic stress and depression in CSA survivors (Molnar et al. 2001) we would expect similar results. It would also be helpful to have a larger sample which would allow for examination of the differences between the two active conditions, particularly potential differences in sudden gains due to change in trauma-related beliefs versus sexuality-related beliefs. Most women in our sample were in a relationship and had completed at least some college; generalizability to a population with less education or to women not in relationships is worthy of further study.

The next step in verifying these results would be an extension to long-term follow up, including rates of recurrence. The most dramatic impact of sudden gains is in relapse prevention: sudden gain responders not only improve faster and to a greater degree, they are also less likely to relapse and exhibit a longer time before relapse, should relapse occur (Tang et al. 2007). Finally, although there was minimal participant contact with research administrators in the present study protocol, to make definite conclusions we must replicate the findings in a no-contact treatment condition as well. For example, this study could potentially be replicated online, with brief follow-up (e.g., by telephone) for risk assessment. Nevertheless, our findings suggest that sudden gains on a measure of trauma-related symptoms during a patient-directed expressive writing treatment predict depression reduction in a manner similar to therapist-guided psychotherapies.

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