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SUDDEN GAINS IN TRAUMA-FOCUSED COGNITIVE-BEHAVIORAL THERAPY FOR
CHILD AND ADOLESCENT TRAUMA VICTIMS

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A thesis presented to the faculty of Towson University in partial fulfillment of the requirements
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ABSTRACT

Sudden Gains in Trauma-Focused Cognitive-Behavioral Therapy for Child and Adolescent Trauma Victims

Brittany Gibby

Little is known about the phenomenon of sudden gains, or large between-session improvements, during treatment of youth trauma victims, but research with adults has found sudden gains to be associated with greater improvement at posttreatment. The present study evaluated occurrence of trauma-related distress and depression gains at multiple time points within treatment, characteristics associated with presence of gains, and association between gains and posttreatment outcomes in a sample of 74 youth trauma victims treated with TF-CBT. Results indicated that trauma-related gains were the most frequent, gains occurred most often early and late in treatment, select gain types were associated with participant characteristics (e.g., minority status, session 1 depression), and gains were not associated with posttreatment outcomes. Findings are among the first to suggest that certain participants are predisposed to the experience of gains in treatment, and bimodal distribution of gains may highlight the various mechanisms by which gains are initiated.

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Introduction

Childhood traumatic stress is a major public health issue, with a recent review by Saunders and Adams (2014) reporting high prevalence rates based on five nationwide studies of youth exposed to serious trauma in the United States: a) the National Survey of Children's Exposure to Violence (NatSCEV); b) the National Survey of Children's Exposure to Violence II (NatSCEV II); c) the National Survey of Adolescents (NSA); d) the National Survey of Adolescents – Replication (NSA-R); e) the National Comorbidity Study – Adolescent supplement (NCS-A). Regarding sexual victimization, findings from these surveys estimate that between 8-10% of youth in the United States have experienced at least one incidence of sexual assault, with victimization rates higher among girls than boys. Lifetime prevalence rates of experiencing physical violence ranged widely among studies, from 17% to 71%, depending on how physical assault was defined (e.g., with or without a weapon, without or without injuries, with or without perceived life threat).

Saunders and Adams (2014) separately examined rates of witnessed violence or non-direct trauma exposure (e.g., a child who hears his father physically abuse his mother in the other room, but does not see it happen), as opposed to prevalence of direct victimization as described above. Children and adolescents reported being exposed to violence both at home and in the community, with prevalence rates of in-home exposure to violence ranging from 9% to 33%, and community violence rates of approximately 38%. When asked if they had ever witnessed any violence, 70% of adolescents in the NatSCEV sample reported a history of exposure to violence. Finally, when adolescents in the NSA-R sample were surveyed, 18% reported the loss of a family member or friend to homicide. Despite the high rates of trauma exposure among youth, only a subset go on to develop posttraumatic stress disorder (PTSD), with a recent meta-analysis

by Alisic and colleagues (2014) concluding that approximately 16% of children and adolescents exposed to trauma will subsequently develop PTSD, with higher rates among those exposed to traumas of an interpersonal nature (e.g., physical abuse) compared to those who have experienced non-interpersonal traumas (e.g., motor vehicle accident).

Fortunately, several effective treatments have been developed for youth exposed to trauma, regardless of whether or not the individual meets criteria for a formal diagnosis of PTSD or instead presents with other manifestations of trauma-related distress (e.g., Major Depressive Disorder). Trauma-focused cognitive-behavioral therapy (TF-CBT) is considered the go-to treatment by the National Child Traumatic Stress Network (NCTSN), National Center for PTSD, and National Institute of Justice, with the NCTSN Fact Sheet citing TF-CBT as having the “strongest research evidence of any treatment model for traumatized children” (NCTSN, 2012, p. 3). Despite the evidence supporting treatment for child trauma, less is known about the specific mechanisms by which these treatments help to reduce symptoms. Mechanisms of change have been explored more frequently regarding treatment for depression.

Cognitive behavioral therapy for depression has been shown to be quite efficacious in a number of randomized controlled trials over the past several decades (Craighead, Evans, & Robins, 1992; Ilardi & Craighead, 1994), however, researchers have developed competing theories or rationales for how the treatment achieves its positive results. Beck’s model of cognitive therapy for depression reasons that symptom reductions occur due a decrease in negative cognitions, which are brought about by specific cognitive techniques utilized by the therapist, also referred to as the *cognitive mediation hypothesis* (Beck, 1976; DeRubeis et al., 1990). In contrast, Ilardi and Craighead (1994) examined the group time course (i.e., symptom severity of each individual at every treatment session) of individuals treated with depression in 8

studies, and found that 60-70% of total symptom improvement took place within the first 4 weeks of treatment. They concluded that nonspecific factors, such as therapeutic alliance and decreased hopelessness, explained these early improvements, given that specific cognitive techniques (as reasoned by Beck) have not yet been introduced into treatment, and thus could not explain the changes. Ilardi and Craighead (1994) drew further conclusions based on their review of treatment studies, which they said mapped very well onto Howard and colleagues' (1993) *three phase model of psychotherapy*. Ilardi and Craighead (1994) agreed with Howard and colleagues (1993), that remoralization (i.e., increased hopefulness) occurs over the first few sessions early on in treatment, likely due to nonspecific treatment factors. Remoralization is followed by rapid reductions in symptoms, and finally, the last phase of treatment is characterized by the acquisition of skills via the specific cognitive techniques utilized by the therapist in treatment.

Tang and DeRubeis (1999a), proponents of the cognitive mediation hypothesis, took issue with Ilardi and Craighead's (1994) conclusions about the role of nonspecific factors in treatment, as well as with their methodology in analyzing the prior depression studies. Tang and DeRubeis (1999a) argued that looking at group time course (i.e., average symptom severity of entire sample at each treatment session) was not an effective way to understand what is happening to *individuals* during the course of treatment. Thus, Tang and DeRubeis (1999a) conducted their own analysis by emphasizing individual time course (i.e., symptom severity of each individual at every treatment session). They reasoned that, from a methodological standpoint, examination of individual time course is a superior strategy, given that in a heterogeneous sample where "individual patients' time courses differ substantially from each other, the group mean time course can be misleading" (Tang & DeRubeis, 1999a, p. 284).

As part of carrying out research on cognitive therapy for depressed adults, Tang and DeRubeis (1999b) identified a phenomenon they later defined as *sudden gains*. Generally, sudden gains were defined by Tang and DeRubeis as statistically large between-session improvements on an outcome measure, and the presence of these gains was found to be associated with better patient outcomes at post, 6 months, and 18 months after treatment (e.g., reduced symptom severity). Tang and DeRubeis (1999b) reasoned that gains were related to session content immediately preceding the gain, and specifically that cognitive changes were an impetus for drastic symptom reduction. Following the work by Tang and DeRubeis (1999b), other studies have continued to assess sudden gains in cognitive (e.g., Busch, Kanter, Landes, & Kohlenberg, 2006; Hardy et al., 2005) and in other treatments for depression (e.g., Gaynor et al., 2003; Masterson et al., 2014). Sudden gains have also been identified in individuals with other disorders, including panic disorder (Clerkin, Teachman, & Smith-Janik, 2008), generalized anxiety disorder (Deschenes & Dugas, 2013), hypochondriasis (Hedman et al., 2014), social phobia (Bohn, Aderka, Schreiber, Stangier, & Hofmann, 2013; Hofmann, Schulz, Meuret, Moscovitch, & Suvak, 2006), and obsessive-compulsive disorder (Aderka et al., 2012a), as well as in other therapy types and formats, including behavioral activation (Hopko, Robertson, & Carvalho, 2009), group cognitive behavioral therapy (Kelly, Roberts, & Ciesla, 2005; Norton, Klenck, & Barrera, 2010), prolonged exposure (Aderka, Appelbaum-Namdar, Shafran, & Gilboa-Schechtman, 2011; Doane, Feeny, & Zoellner, 2010), cognitive behavioral based individual and group therapy in a partial hospitalization program (Drymalski & Washburn, 2011) brief psychodynamic-interpersonal psychotherapy (Present et al., 2008), and interpersonal therapy (Kelly, Cyranowski, & Frank, 2007). Some studies have assessed for sudden gains in the treatment of adult PTSD (Doane et al., 2010; Jun, Zoellner, & Feeny, 2013; Kelly, Rizvi,

Monson, & Resick, 2009; König, Karl, Rosner, & Butullo, 2014; Krüger et al., 2014), and to date, only one study has assessed for sudden gains in a sample of youth with PTSD (Aderka et al., 2011).

Related to sudden gains, Tang and DeRubeis (1999b) also explored a phenomena known as *reversals*. A reversal, defined as “whenever a patient gave up 50% of the symptom improvement resulting from a sudden gain,” seems to speak to either the transient or stable nature of gains experienced during treatment (Tang & DeRubeis, 1999b, p. 896). Tang and DeRubeis (1999b) found that only 16% of sudden gainers experienced a reversal before the end of therapy. Other studies have started exploring how many individuals who experience reversals also by the end of treatment go on to regain what was lost during the reversal, either gradually or by way of another sudden gain. Tang and DeRubeis (1999b) argue that if a high number of participants experience reversals but ultimately go on to regain the improvement made during the gain, the reversal (and not the sudden gain) may simply be a normal and transient fluctuation of symptoms.

While findings have varied among studies in terms of number of sudden gains and reversals identified, many studies (but not all) have continued to replicate Tang and DeRubeis’ findings that presence of gains are associated with better posttreatment outcomes (Aderka et al., 2011; Hardy et al., 2005; Kelly et al., 2009; Kelly et al., 2005). Some discrepant findings in the literature include the presence of gains in therapies that are not predominantly cognitive in nature (e.g., pharmacological treatment), thus going against the hypothesized cognitive change reasoning proposed by Tang and DeRubeis (Jun et al., 2013; Vittengl, Clark, & Jarrett, 2005). In addition, the vast majority of studies have attempted to elucidate participant clinical or demographic characteristics associated with the presence of sudden gains. While some studies

have found higher symptom severity at pretreatment to be associated with the presence of gains (e.g., Hofmann et al., 2006; Norton et al., 2010), others have found the opposite (e.g., Doane et al., 2010), and most have found pretreatment symptom severity does not distinguish groups of gainers (Aderka et al., 2011; Bohn et al., 2013; Clerkin et al., 2008; Krüger et al., 2014; Masterson et al., 2014).

The sudden gains criteria originally established by Tang and DeRubeis (1999b) automatically excluded gains occurring prior to the third session of treatment, with Tang and DeRubeis explaining that in cognitive therapy, the content of these sessions tends to be more focused on administrative tasks and not on cognitive techniques, and thus gains following these sessions may not be clinically relevant. However, based on Ilardi and Craighead's theory (1994) that the majority of change in treatment occurs within the early sessions, other researchers began to modify Tang and DeRubeis' criteria to specifically assess for the presence of these early gains, which Ilardi and Craighead state are due to nonspecific factors associated with rapid treatment response (e.g., reduction of hopelessness, optimism regarding initiation of treatment, presentation of treatment rationale, client characteristics).

The present study aimed to address several gaps in the literature by exploring the following: the occurrence of sudden gains in trauma-related distress and depression in a sample of child and adolescent trauma victims at multiple time points within treatment; the association between sudden gains and posttreatment outcomes; and demographic and participant characteristics associated with the presence of sudden gains. We hypothesized that 1) children and adolescents would experience trauma-related and depression sudden gains, but that frequency of trauma-related gains would be higher given the nature of the sample (i.e., experienced a trauma) and type of treatment (TF-CBT), 2) first session sudden gains (i.e., those

immediately following session one) would occur, but not as frequently as later gains, 3) depression gains would be associated with better depression outcomes at posttreatment, and 4) trauma-related gains would be associated with better depression and trauma outcomes at posttreatment (given that TF-CBT has been shown to be moderately effective in reducing symptoms of depression in samples of traumatized participants). Although certain trauma characteristics have been associated with higher levels of trauma symptoms (e.g., chronic trauma, life threat or injury during trauma), the sudden gains literature has not found trauma characteristics to be associated with presence of gains, thus no specific hypotheses were made. Exploratory analyses were also conducted to identify incidents of reversals, regains among those who experienced reversals, and the specific patterns of sudden gain presentation throughout the sample (e.g., depression and PTSD gain, PTSD gain only).

Method

Participants

Participants ($N = 132$) were child and adolescent trauma victims who participated in a larger research study evaluating the efficacy of TF-CBT. Consistent with recommendations put forth by Tang and DeRubeis (1999b), participants were excluded if they completed fewer than seven treatment sessions (not including pre or posttreatment assessment sessions), as these participants did not receive an adequate amount of treatment, which could complicate findings (e.g., a participant who completed two sessions only has that period of time to experience a sudden gain, far less than those who continue to receive a sufficient dose of CBT). Thus, our final sample consisted of 74 participants (mean age 10.38 years, $SD = 3.37$ [range 5-18], 62% female). All participants lived in a large city in the Southwestern United States when they received treatment. Sample characteristics are presented in Tables 1a and 1b.

Children were eligible to participate in the larger research study if they met three criteria: a) fluent English speaker; b) not living or no longer living with the perpetrator; c) either a co-, indirect, or direct victim of a violent trauma. Using physical abuse as an example, a co-victim could be the sibling of an abused child who did not witness the physical abuse; an indirect victim could be the sibling of an abused child who did witness the physical abuse; and a direct victim could be the child who received the physical abuse.

Measures

An assessment battery was administered to children during session 1, posttreatment, and follow-up. Two measures were given regularly during treatment: a measure of depressive symptom severity and trauma symptom severity. Administration of these measures alternated from one weekly session to the next, thus depression and trauma symptoms were each assessed

on a bimonthly basis. Although it is recommended that sudden gains be assessed via measurements obtained at every treatment session (Tang & DeRubeis, 1999b), researchers have analyzed gains according to bimonthly assessments (Tang, Luborsky, & Andrusyna, 2002; Vittengl et al., 2005). Thus, our study will not assess sudden gains from one *session* to the next, but from one *administration* to the next.

Demographic Information Questionnaire. Sociodemographic information including participant age, sex, ethnicity, parent marital status, and family income was obtained through the administration of this measure to children and families. To assess differences between groups on these demographic items, a sufficient *n* for all variable levels was needed. For this reason, levels of the following variables were merged: parent marital status (married vs. non-married [single, separated/divorced, widowed]) and ethnicity (now referred to as “minority status”; white vs. non-white/minority [African American, Hispanic, Other]).

Trauma Characteristics Questionnaire. Developed by Battle (1998), this questionnaire was used to obtain qualitative information pertaining to the child victim’s traumatic experience(s). In particular, the following five characteristics were included in the questionnaire: victim type (previously described above), trauma type, relationship of the perpetrator to the child victim, threat or injury level, and chronicity of the abuse (single vs. multiple episodes). Previous research has found pre-, peri-, and posttraumatic characteristics related to the victim and/or trauma to be more closely associated with the subsequent development of PTSD or other types of psychological symptoms. Specifically, findings suggest that direct victims, interpersonal traumas, familiar perpetrators, and life threat or injury during the trauma are all variables that are more likely to result in the development of PTSD.

An examination of *n* values for each level of the characteristics resulted in the following mergers: victim type (direct vs. non-direct [indirect, co-victim]), trauma type (non-sexual assault [murder, physical assault] vs. sexual assault [genital touching only, attempted penetration, actual penetration]), and threat or injury level (neither physical injury nor life threat vs. either physical injury, life threat, or both [physical injury only or life threat only, life threat and physical injury]). Level merges within the relationship of perpetrator to victim variable were not possible due to uncertainties regarding distinction between levels (e.g., some levels [stranger, acquaintance] are defined based on familiarity, while another [older child] is based on age, thus complicating which attribute [familiarity or age] supersedes the other). As a result, only descriptive data pertaining to this variable are presented.

Children's Depression Inventory (CDI; Kovacs, 1985; 1992). The CDI is a 27-item self-report measure of depressive symptoms (e.g., motivation, fatigue, sleep disturbance, sleep disturbance). Developed for children and adolescents, the CDI was designed based on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and is comprised of items scored 0-2, with total scores ranging from 0 to 54. For each item, respondents are instructed to select one of the three statements that best describes how they felt over the past two weeks (e.g., "I am sad once in a while", "I am sad many times", or "I am sad all the time"). Internal consistency for total depression score is adequate ($\alpha = .71 - .89$; D' Angelo & Augenstein, 2012; Muller & Erford, 2012), and thus is appropriate for screening purposes. Test-retest reliability is also adequate ($r = .87$; Freeman, 2007), while concurrent validity ranges from high to very high ($r = .71$ with the Reynold's Child Depression Scale [RCDS], $r = .83$ with the Reynold's Adolescent Depression Scale [RADS]; Masip, Amador-Campos, Gomez-Benito, & del Barrio Gandara, 2010). In addition, in their detailed review of measures regarding children

exposed to violence, Acosta and colleagues (2012) listed the CDI as one of the measures meeting all four of their dual-use criteria (i.e., used in a research setting, clinically relevant, published psychometrics, minimal burden) and thus recommended its use. Internal consistency for the current sample was acceptable ($\alpha = .85$), per the calculation in Chasson, Vincent, and Harris (2008). Allgaier and colleagues (2012) reviewed various cutoffs used to distinguish between individuals with and without depression, from a cutoff of 12 (8-12 year olds referred for outpatient psychological services; Lobovits & Handal, 1985), to 16 (8-18 year olds referred from in- and outpatient centers; Timbremont, Braet, & Dreesen, 2004), to 19 (severe psychiatric inpatients; Masip et al., 2010). Saylor, Finch, Spirito, and Bennett (1984) recommends considering scores higher than 12 to be in the depressive range.

Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979). The IES is a 15-item self-report measure of subjective distress and psychological trauma-related symptoms experienced within the past seven days. Although initially utilized in samples of adults, in his psychometric review of the IES, Joseph (2000) detailed the use of the measure in samples of children and adolescents, with McNally (1991) describing the IES as “probably the best questionnaire available for evaluating childhood PTSD” (Joseph, 2000, p. 102). Items assess the frequency of intrusive thoughts (e.g., “I thought about it when I didn’t mean to” and “Pictures about it popped into my mind”) and avoidant behaviors (e.g., “I tried not to talk about it” and “I tried not to think about it”). Items are scored on a four-point scale (i.e., 0 = Not at all, 1 = Rarely, 3 = Sometimes, 5 = Often), yielding total scores between 0 and 75, with higher scores indicating more frequent intrusive experiences and avoidance behaviors. Internal consistency is satisfactory for the intrusive thought subscale ($\alpha = .78$), avoidance subscale ($\alpha = .82$), and total score ($\alpha = .86$) (Horowitz et al., 1979; Zilberg, Weiss, & Horowitz, 1982). Internal consistency for the

current sample was calculated in Chasson et al. (2008), yielding acceptable scores (intrusive subscale $\alpha = .86$, avoidance subscale $\alpha = .89$). Although the IES has received some criticism regarding its use as a diagnostic tool, the present study utilized the IES as a measure of symptom severity, which is supported the literature (Joseph, 2000). Thus, severity thresholds identified by Horowitz (1982) were utilized, with scores less than 8.5 classified as low, scores from 8.6 to 19.0 classified as medium, and scores higher than 19.0 classified as high.

Procedure

As previously described in Chasson et al. (2008) and Chasson, Mychailyszyn, Vincent, and Harris (2013), child and adolescent trauma victims were self-referred for treatment at a university community clinic either by parents or by community agencies, including child witness advocacy programs and police departments. Treatment was provided at no cost to families, children were voluntary participants, and families were not compensated for participation. Eligible children and adolescents, as determined by a telephone intake screen with the parent, were contacted by their assigned therapist and attended an initial meeting. The child's parent or legal guardian provided informed consent, and child assent was also obtained. The study was conducted according to the guidelines of the university's Institutional Review Board (IRB).

Clinical psychology doctoral students at the university delivered the comprehensive exposure-based trauma-focused cognitive-behavioral treatment, which included four distinct phases. Phase one (approximately Sessions 1-3) consisted of predominantly administrative and study-procedural tasks. Specifically, assent and consent were obtained from the child and parent respectively, parents provided information about the traumatic event associated with the current need for treatment, pretreatment assessments were completed (in writing for children who could read, and verbally by children who could not read), and finally treatment was initiated. In the

second phase (approximately Sessions 3-10), treatment focused on mastery of coping skills, and use of exposure therapy to alleviate trauma-related symptoms. In phase three (approximately Sessions 10-15), the therapists' aimed to work on interpersonal functioning and address social skill deficits. Phase four (approximately Sessions 15-20) was focused on preparing the child for treatment termination, and exploring obstacles in the future that could possibly interfere with continued maintenance of treatment gains. Although the treatment program typically consisted of hour long weekly sessions, the model was flexible and modified (i.e., total number of sessions, order in which treatment elements were implemented) depending on the needs of the child.

Criteria for Sudden Gains, Reversals, and Regains

Original criteria by Tang and DeRubeis (1999b) proposed that sudden gains should meet three standards: a) gains should be large in *absolute* terms, b) they should exceed 25% of the session score just prior to the gain, and c) the mean of the three pregain sessions (just prior to the gain) should be significantly different from the mean of the three postgain sessions (immediately following the gain). Consistent with previous research (Aderka et al., 2011; Hofmann et al., 2006), we utilized the Reliable Change Index to calculate cutoff scores. These cutoff scores determined which gains were indeed large in *absolute* terms. This resulted in a CDI cutoff score of 6.31, which was conservatively rounded up to a final cutoff of 7. A cutoff of 7.28 was calculated for the IES, which was similarly rounded up to a score of 8.

While criterion B of the sudden gain definition was kept consistent with Tang and DeRubeis (1999b), criterion C was modified for the present study. This final criterion has received some criticism in the literature, with some authors citing the issue of autocorrelation of the data (Hardy et al., 2005; Vittengl et al., 2005), and others explaining that the very definition of the criteria prevents the calculation of sudden gains occurring between sessions 1 and 2 of

treatment, as sufficient number of pregain sessions (i.e., three) have yet to occur (Aderka, Nickerson, Boe, & Hofmann, 2012b; Kelly et al., 2005). In addition to these critiques, the format of data collection in the present study (i.e., biweekly data collection) would result in analyses of non-consecutive pregain and postgain session mean scores (e.g., a CDI sudden gain between sessions 6 and 8 would utilize scores from sessions 2, 4, and 6 [pregain], and 8, 10, and 12 [postgain]). Thus, we utilized a modified third criterion (Clerkin et al., 2008; Hopko et al., 2009; Kelly et al., 2007; Kelly et al., 2005), in which we calculated each individual's standard deviation of scores (either CDI or IES, respectively). If a sudden gain was 1.5 times larger than the individual's standard deviation during treatment, thus reflecting a distinct change from the individual's typical variation, it fulfilled the third criterion.

For the purpose of this study, reversal was defined according to Tang and DeRubeis (1999b) as an individual's subsequent score returning to or exceeding the mean of the pregain and postgain session scores (e.g., with a pregain CDI score of 25 and a postgain CDI score of 5, a subsequent score of 15 or higher would constitute a reversal, because 15 is the mean of 25 and 5). Based on these criteria, regain was defined as a return to within 50% of the improvement achieved during the original gain by the final treatment session (e.g., using the above example, a final session score < 15 would constitute a regain).

Data Analytic Plan

First, descriptive data are presented on the occurrence of sudden gains (i.e., frequency, timing), concordance of sudden gain types, and reversal/regain rates. Second, a series of bivariate regressions were conducted to assess whether treatment outcomes could be predicted by status (i.e., no vs yes) on two dichotomous dummy-coded types of sudden gains: 1) presence or absence of any CDI gain (henceforth referred to as Any CDI Gain, and 2) presence or absence of

any IES gain (henceforth referred to as Any IES Gain). Third, a series of regressions (for continuous dependent variables) or chi square tests (for categorical dependent variables) were conducted to assess whether participant variables could be predicted by the two broad types of sudden gains.

These data analytic steps were identically carried out but using a different grouping of gains based on the timing of the gain: 1) presence or absence of a CDI gain between the first administration of the measure at session 1 and second administration of the measure at either session 2 or 3 (henceforth referred to as CDI First Session Gain), and 2) presence or absence of CDI gain(s) at any other time during treatment (henceforth referred to as CDI Later Gain). There was also a similar breakdown for the trauma measure: 1) presence or absence of an IES gain between the first administration of the measure at session 1 and second administration of the measure at either session 2 or 3 (henceforth referred to as IES First Session Gain), and 2) presence or absence of IES gain(s) at any other time during treatment (henceforth referred to as IES Later Gain). Groups were not mutually exclusive (e.g., a participant who experienced both a CDI First Session Gain and a CDI Later Gain would be included in the CDI First Session group and the CDI Later group).

Results

Frequency of CDI Sudden Gains

Any CDI Gain. Across sequential administrations of the CDI, a total of 32 gains were identified in 26 of the 74 participants (35%). Of those participants with a sudden gain, four experienced 2 sudden gains and one experienced three gains. The average CDI magnitude of the gain was 10.84 ($SD = 4.25$, Range = 7-25).

CDI First Session Gain. When only looking at gains between the first CDI administration (i.e., session 1) and second administration (i.e., either session 2 or session 3) that met all three criteria, a total of 8 were identified in the 74 participants (11%). The average magnitude of the CDI First Session gain was 11 ($SD = 2.73$, Range = 7-16).

CDI Later Gain. When only looking at later gains that met all three criteria, a total of 24 were identified in 20 of the 74 participants (27%), with two participants experiencing two sudden gains, and one participant experiencing three gains. The average magnitude of the gain was 10.79 ($SD = 4.70$, Range = 7-25).

Frequency of IES Sudden Gains

Any IES Gain. Across sequential administrations of the IES, a total of 67 sudden gains were identified in 46 of the 74 participants (62%). Of those participants with a sudden gain, 13 experienced two gains, and four experienced three gains. The average magnitude of the IES gain was 24.88 ($SD = 11.99$, Range = 8-69).

IES First Session Gain. When only looking at gains between the first IES administration (i.e., session 1) and second administration (i.e., either session 2 or session 3) that met all three criteria, a total of 17 were identified in the 74 participants (23%). The average IES magnitude of the IES First Session gain was 28.71 ($SD = 13.26$, Range = 8-61).

IES Later Gain. When only looking at later gains that met all three criteria, a total of 50 were identified in 37 of the 74 participants (50%), with 11 participants experiencing two sudden gains, and one participant having three gains. The average magnitude of the gain was 23.58 ($SD = 11.38$, Range = 8-69).

Timing of Sudden Gains

Irrespective of measure (i.e., CDI or IES), the largest number of gains occurred immediately following the first session (see Tables 2a and 2b). Although sudden gain calculations represent changes between consecutive measure administrations rather than consecutive treatment sessions (e.g., gain between third and fourth measure administration actually corresponds to symptom reduction between sessions 5 and 7), session numbers presented in Tables 2a and 2b reflect the number of the actual pregain session (instead of administration number), to enhance ease of interpretation in context of stage of treatment. Since the standard treatment model consists of approximately 20 treatment sessions, sudden gains occurring beyond session 20 were collapsed in Tables 2a and 2b.

Patterns of Sudden Gains on the CDI and IES

As the sudden gain categories defined above (i.e., Any, First Session, and Later) simply depict the presence or absence of the respective gain and are thus not mutually exclusive, Table 3 classifies all gainers into distinct categories based on specific gain presentation. Although 14 specific gain patterns were identified, 63.46% of the 52 gainers in the sample were accounted for in three gain pattern groups: 1) those with an IES Later gain only; 2) those with a CDI Later and IES Later gain only; and 3) those with an IES First Session gain only. It is important to note that all 8 participants who experienced a CDI First Session gain (see Table 1a) went on to experience

at least 1 other gain in treatment, as evidenced by the *n* for the CDI First Session gain pattern in Table 3.

Frequency of Reversals and Regains

Descriptive data regarding reversals and regains for various groups of sudden gainers are presented in Table 4. While reversal and regain rates ranged widely between the sudden gain types reported (reversal range = 38-88%, regain range = 50-100%), a distinct pattern emerged. Irrespective of measure (e.g., CDI or IES), percentage of reversals was lowest among the First Session sudden gainers and highest among the Later sudden gainers. An opposite pattern of regains emerged, again irrespective of measure, with percentage of regains highest among the First Session sudden gainers and lowest among the Later sudden gainers. Finally, it is important to note that all participants who experienced multiple later sudden gains (either in depressive or PTSD symptoms) subsequently experienced a reversal.

CDI Sudden Gains and Outcome

Table 1a presents detailed information for separate regressions predicting treatment-related outcomes, including total number of sessions and posttreatment symptom severity (i.e., depressive and trauma-related symptoms) from CDI sudden gain status (i.e., presence or absence of gain). Presence of any CDI sudden gain did not predict any treatment-related outcomes. The same findings emerged when only looking at CDI First Session gain status. However, when examining CDI Later gain status, presence of a gain predicted higher posttreatment depression.

IES Sudden Gains and Outcome

Table 1b presents detailed model information for separate regressions predicting treatment-related outcomes, including total number of sessions and posttreatment symptom severity from IES sudden gain status (i.e., presence or absence of gain). Presence of any IES

sudden gain did not predict any treatment-related outcomes. The same findings emerged when looking only at IES First Session gain status. However, when examining IES Later gain status, presence of a gain predicted higher total number of treatment sessions.

Sudden Gains and Participant Characteristics

A series of regressions and chi square analyses were conducted to determine if sudden gainers differed on any continuous (i.e., age, family income, session 1 symptom severity) and categorical (i.e., sex, minority status, parental marital status, victim type, trauma type, threat/injury level, chronicity of abuse) participant characteristics. Test statistics from the respective analyses are presented in Tables 1a and 1b. Due to insufficient expected cell counts, three out of seven chi square analyses could not be conducted for IES First Session gainers, and none could be carried out for the CDI First Session gainers. As outlined in Tables 1a, presence of any CDI gain predicted higher session 1 depression. In addition, there was a significant association between the type of trauma experienced and whether or not the participant had any CDI gain. Based on the odds ratio, the odds of participants having any CDI sudden gain were 4.54 times higher if they had experienced a sexual assault than if they had experienced a nonsexual assault. In addition, the presence of a CDI First Session gain predicted higher session 1 depression, and presence of a CDI Later gain predicted higher session 1 depression.

With respect to the IES, as outlined in Table 1b, the presence of any gain predicted higher trauma-related symptom severity scores at session 1. There was a significant association between minority status and whether or not the participant had any IES gain; based on the odds ratio, the odds of participants having any IES sudden gain were 3.33 times higher if they were white than if they were non-white. There was also a significant association between level of threat or injury during the trauma and the experience of any IES gain. The odds of participants having any IES

gain were 4.06 times higher if they did not experience physical injury or life threat during their trauma than if they had experienced either physical injury, life threat, or both. Lastly, the presence of an IES Later gain predicted younger participant age.

Discussion

Trauma-related and depression sudden gains were identified in our sample of children and adolescent trauma victims, with 35% of participants experiencing Any CDI gain and 62% experiencing Any IES gain. The rate of CDI gains was well within the range of gains identified in a recent meta-analysis (14.6% - 52.2%; Aderka et al., 2012b), while the percentage of IES gains surpassed this range. As hypothesized, IES gains were more frequent than CDI gains. Rates of reversals, although different between First Session and Later gainers, were within the range of reversals reported in the meta-analysis (9.1% - 85.7%; Aderka et al., 2012b).

It was a primary goal of the current study to elucidate two issues surrounding sudden gains: a) who has them and when; b) what happens after the gain. Although prior studies have been more consistently able to speak to what happens after the gain (i.e., better treatment outcomes), the current findings were mixed. Although we found that presence of a CDI Later gain was associated with higher depression scores than non-gainers at posttreatment, it should be noted that the posttreatment means for CDI Later gainers and non-gainers were both below the CDI cutoff of 12, and thus not considered to be in the depressive range. The remaining findings regarding the “who” and the “when” described above can actually be understood best using both of the competing theories of change in treatment: nonspecific/common factors theory (Ilardi & Craighead, 1994) and specific factors theory (Tang & DeRubeis, 1999b). Ultimately, recent research has begun to explore both theories as more complementary than distinct (Tschacher, Junghan, & Pfammatter, 2014).

Among our sample, we found certain client characteristics (i.e., not specific treatment factors, like cognitive restructuring) to be associated with various types of gains, including Caucasian ethnicity, absence of threat or injury during trauma, higher depression at session 1,

and type of trauma experienced. Although some of the factors above are typically associated with being more symptomatic (i.e., risk factors), while others are considered protective factors, the present study is among the first to demonstrate an association between sudden gain status and any factors unrelated to treatment, and is the first to demonstrate these associations in a sample of child and adolescent trauma victims. Interpretation of *why* these various groups were more or less likely to experience gains is unclear and should be a focus in future studies.

We also found a high prevalence of First Session gains (CDI and IES), and when looking at the timing of all gains in treatment, gains at this time were the most frequent, followed by gains at the very end of treatment. This bimodal distribution of gains is interesting, as it seems to speak to the initiation of treatment as being an impetus for achieving a gain (for reasons including decreased hopelessness or positive thoughts about initiating treatment), while the high frequency of gains at the end of treatment seems to speak to an overall TF-CBT specific treatment effect and accumulation of knowledge and skills. It is also possible that these late gains could be attributed to the anticipation of completing treatment, in combination with the support and encouragement provided at this stage by the therapist. For example, a child who is told by his therapist that he is ready to end treatment because he has made great improvements, mastered skills, and will be able to apply them outside of the therapeutic setting may feel thoroughly self-assured and confident, and subsequently experience a sudden gain. It is worth noting that the present study found the highest proportion of sudden gains to occur following the initial treatment session, while a study of attrition, that utilized the larger child and adolescent population from which the current sample was drawn, found the highest proportion of participants dropped out of treatment following the initial treatment session (Chasson et al.,

2008). There seems to be something distinct about the first portion of treatment that is related to both sudden improvements and treatment dropout that is worth exploring in further studies.

These findings are the first to suggest that variables unrelated to treatment may serve as predictors of sudden gains, and thus some participants may begin treatment already more likely to experience gains than others. Gains were not associated with better treatment outcomes, but this may speak to methodological differences (e.g., timing of measure administration), as well as the severity of our sample compared to other PTSD sudden gain studies (i.e., our participants were all victims of severe, violent, interpersonal trauma). In addition, the present study is one of only a few that have investigated sudden gains in children and adolescents. In addition, the present study did not require participants to meet specific DSM diagnostic inclusion criteria, and thus could include a broader sample than those restricting their sample based on development of PTSD or another DSM diagnosis.

The majority of prior studies have not found differences in pre- or early treatment symptom severity among gainers and non-gainers, but they have found that gainers demonstrated greater improvements at posttreatment. It is possible that sudden gains served to give participants a boost in terms of symptom improvement, leading them to surpass their non-gaining counterparts at posttreatment. Contrary to the hypothesis, the current study found no differences between gainers and non-gainers at posttreatment. However, the idea of sudden gains eliciting a boost in symptom improvement is not necessarily inconsistent with this null finding. Unlike previous research, gainers in the current study differed in symptom severity at session 1 compared to non-gainers, as they experienced higher levels of symptom severity. Thus, contrary to other studies in the research literature, the two groups in the current study did not start off equal in terms of symptoms early on in treatment, indicating that sudden gainers had to catch up

to non-gainers over the course of treatment. In fact, the lack of differences in outcome between gainers and non-gainers may suggest that the gainers were able to make some meaningful strides in treatment.

Limitations and Future Directions

The study included limitations that need addressing in future research. The sample size was small, resulting in some cell counts being insufficient for carrying out analyses. The sample size also limited statistical power, which in turn made it infeasible to control for inflated type I error rates via multivariate analyses or error rate corrections. Second, the biweekly administration of assessment measures did not allow for the identification of session by session improvements. In addition, sudden gains were based on child self-reported symptoms. However, a previous study of sudden gains in a sample of child outpatients with a variety of mental health issues, found outcomes did not differ based on whether the sudden gain was defined using to child self-reported symptoms versus symptoms reported by the parent (Dour, Chorpita, Lee, & Weisz, 2013). Also, subgroups of sudden gainers were small, and thus generalizing findings is difficult. With respect to generalizability, it was unknown how many participants in the sample met formal diagnostic criteria for PTSD. Though, a comparison of mean scores and clinical cutoff scores (i.e., scores of 19 or higher are considered to be high) indicate that our sample was especially symptomatic, and thus likely similar to other samples of children and adolescents with PTSD. Finally, the format of the “trauma type” item on the Trauma Characteristics Questionnaire did not allow for: a) documentation of all traumas experienced (i.e., only the “highest number trauma” was captured); b) the child to record which trauma (had more than one been experienced) had been the most subjectively distressing (e.g., a child who experienced

physical assault and sexual assault with penetration may not have been the most distressed by the sexual assault, although studies suggest that is most likely).

Notwithstanding these study limitations, the present study is only the second to explore sudden gains in a sample of child and adolescent trauma victims, and among the first to find gains associated with client variables unrelated to treatment, suggesting that there may be certain individuals who enter treatment already more likely to experience sudden gains than others. In addition, the timing of gains noted in the study is of utmost importance, and can serve to inform future research on the possible mechanisms involved in the treatment of this particular group. Future studies should continue to assess sudden gains during treatment of trauma, as well as in child and adolescent samples. In addition, differences in timing of gains among participants, as well as concordance of gains should be explored in larger samples, as it is possible certain types of gains or gains at certain times could be acting as catalysts for subsequent gains or improvement in treatment. Finally, studies should continue to explore participant characteristics associated with gains, especially those identified in the present study.

Table 1a. Demographic, trauma, and treatment characteristics for the entire sample and the participants with and without depression sudden gains.

Characteristic	All			First Session			Later			Any			
	SG M = 10.38 SD = 3.37	No.SG M = 10.25 SD = 3.37	r or Odds Ratio r = .106	SG M = 9.35 SD = 3.47	No.SG M = 10.78 SD = 3.28	F or χ^2 F = 7.81	SG M = 9.85 SD = 3.55	No.SG M = 10.69 SD = 3.27	F or χ^2 F = 2.658	r or Odds Ratio r = -.193	SG M = 9.85 SD = 3.55	No.SG M = 10.69 SD = 3.27	F or χ^2 F = 1.029
Age ^a													
Sex ^b (Female N, %)	44 (62%)	38 (60.3%)	-	14 (70%)	30 (58.8%)	-	19 (73.1%)	25 (55.6%)	$\chi^2 = .761$	Odds = 1.633	9 (34.6%)	16 (37.2%)	$\chi^2 = 2.147$
Minority Status ^c													
White	25 (36.2%)	23 (37.7%)	-	7 (35%)	18 (36.7%)	-	17 (65.4%)	27 (62.8%)	$\chi^2 = .018$	Odds = 1.078	12 (50%)	15 (42.8%)	$\chi^2 = .047$
Non-white	44 (63.8%)	38 (62.3%)	-	13 (65%)	31 (63.3%)	-	9 (34.6%)	17 (62.8%)			12 (50%)	15 (42.8%)	
Family Income ^d			r = -.267			F = 4.378			F = .053	r = .031			F = 981
Under \$10,000	27 (45.8%)	21 (40.4%)		7 (36.8%)	20 (50%)		12 (50%)	15 (42.8%)					
\$10,000 - \$19,999	3 (5.1%)	3 (5.8%)		1 (5.3%)	2 (5%)		1 (4.2%)	2 (5.7%)					
\$20,000 - \$29,999	19 (32.2%)	18 (34.6%)		9 (47.3%)	10 (25%)		9 (37.4%)	10 (28.6%)					
\$30,000 - \$39,999	3 (5.1%)	3 (5.8%)		1 (5.3%)	2 (5%)		1 (4.2%)	2 (5.7%)					
\$40,000 - \$49,999	5 (8.4%)	5 (9.6%)		0	5 (12.5%)		0	5 (14.3%)					
\$50,000 - \$59,999	2 (3.4%)	2 (3.8%)		1 (5.3%)	1 (2.5%)		1 (4.2%)	1 (2.9%)					
Parent Marital Status ^e													
Married	30 (44.1%)	24 (40%)	-	7 (35%)	23 (47.9%)	-	12 (50%)	18 (42.9%)	$\chi^2 = .955$	Odds = 1.709	12 (46.2%)	18 (42.9%)	$\chi^2 = .071$
Non-married	38 (55.9%)	36 (60%)	-	13 (65%)	25 (52.1%)	-	14 (53.8%)	24 (57.1%)					
Victim Type ^f													
Direct	49 (70%)	41 (66.1%)	-	15 (75%)	34 (68%)	-	21 (80.8%)	28 (63.6%)	$\chi^2 = .333$	Odds = .708	21 (80.8%)	28 (63.6%)	$\chi^2 = 2.284$
Non-direct	21 (30%)	21 (33.9%)	-	5 (25%)	16 (32%)	-	5 (19.2%)	16 (36.4%)			5 (19.2%)	16 (36.4%)	
Trauma Type ^g													
Sexual Assault	45 (66.2%)	37 (61.7%)	-	16 (80%)	29 (60.4%)	-	22 (84.6%)	23 (54.8%)	$\chi^2 = 2.419$	Odds = 2.621	22 (84.6%)	23 (54.8%)	$\chi^2 = 6.394^{**}$
Non-sexual assault	23 (33.8%)	23 (38.3%)	-	4 (20%)	19 (39.6%)	-	4 (15.4%)	19 (45.2%)			4 (15.4%)	19 (45.2%)	
Perpetrator Type													
Older Child	12 (17.1%)	11 (17.7%)	-	5 (25%)	7 (14%)	-	6 (23.1%)	6 (13.6%)			6 (23.1%)	6 (13.6%)	
Stranger	10 (14.3%)	9 (14.5%)	-	1 (5%)	9 (18%)	-	1 (3.8%)	9 (20.5%)			1 (3.8%)	9 (20.5%)	
Acquaintance	12 (17.1%)	11 (17.7%)	-	5 (25%)	7 (14%)	-	6 (23.1%)	6 (13.6%)			6 (23.1%)	6 (13.6%)	
Person Known Well	16 (22.9%)	4 (50%)	-	1 (5%)	15 (30%)	-	4 (15.4%)	12 (27.3%)			4 (15.4%)	12 (27.3%)	
Caretaker/Parent Role	20 (28.6%)	19 (30.6%)	-	8 (40%)	12 (24%)	-	9 (34.6%)	11 (25%)			9 (34.6%)	11 (25%)	
Threat/Injury Level ^h													
Physical injury, life threat, or both	32 (50%)	28 (49.1%)	-	10 (52.6%)	22 (48.9%)	-	12 (50%)	20 (50%)	$\chi^2 = .075$	Odds = 1.162	12 (50%)	20 (50%)	$\chi^2 = .000$
Neither physical injury nor life threat	32 (50%)	29 (50.9%)	-	9 (47.4%)	23 (51.1%)	-	9 (47.4%)	20 (50%)			9 (47.4%)	20 (50%)	
Abusive Incidents ⁱ													
One	35 (50%)	32 (51.6%)	-	8 (40%)	27 (54%)	-	10 (38.5%)	25 (56.8%)	$\chi^2 = 1.120$	Odds = 1.761	10 (38.5%)	25 (56.8%)	$\chi^2 = 2.203$
More than one	35 (50%)	30 (48.4%)	-	12 (60%)	23 (46%)	-	16 (61.5%)	19 (43.2%)			16 (61.5%)	19 (43.2%)	
# of Treatment Sessions ^b	M = 19.85 SD = 9.51	M = 19.02 SD = 7.43	r = .254	M = 21 SD = 8.98	M = 19.43 SD = 9.75	F = 4.976	M = 23 SD = 12.95	M = 18.15 SD = 6.55	F = .396	r = .074	M = 23 SD = 12.95	M = 18.15 SD = 6.55	F = 4.610
CDI at First Session ^b	M = 9.85 SD = 6.8	M = 9.00 SD = 6.49	r = .362	M = 13.40 SD = 6.09	M = 8.54 SD = 6.62	F = 10.878^{***}	M = 13.81 SD = 5.54	M = 7.71 SD = 6.48	F = 8.212^{***}	r = .320	M = 13.81 SD = 5.54	M = 7.71 SD = 6.48	F = 16.463^{***}
CDI at Post ^b	M = 5.15 SD = 5.88	M = 5.38 SD = 6.15	r = -.113	M = 8.50 SD = 6.61	M = 3.91 SD = 5.12	F = .935	M = 7.12 SD = 6.38	M = 4.08 SD = 5.36	F = 10.000^{***}	r = .349	M = 7.12 SD = 6.38	M = 4.08 SD = 5.36	F = 4.714
IES at First Session ^b	M = 32.08 SD = 16.75	M = 31.52 SD = 16.56	r = .098	M = 36.20 SD = 16.99	M = 30.56 SD = 16.55	F = .694	M = 35.88 SD = 17.71	M = 30.02 SD = 16.01	F = 1.673	r = .151	M = 35.88 SD = 17.71	M = 30.02 SD = 16.01	F = 2.099
IES at Post ^b	M = 17.96 SD = 16.33	M = 17.21 SD = 16.68	r = .132	M = 21.75 SD = 15.76	M = 16.56 SD = 16.46	F = 1.284	M = 21.85 SD = 14.99	M = 15.85 SD = 16.78	F = 1.487	r = .142	M = 21.85 SD = 14.99	M = 15.85 SD = 16.78	F = 2.311

Note. First Session = sudden gain (SG) experienced between the first (session 1) and second (session 2 or 3) administration of the Children's Depression Inventory (CDI). Later = at least one sudden gain experienced on the CDI during treatment, excluding those that defined as First Session gains. Any = any sudden gain (either First Session, Later, or both) experienced on the CDI during treatment. Values in the SG columns include only participants who experienced the indicated type of CDI/SG. Values in the No SG column include participants who did not experience the indicated type of CDI/SG during treatment. F-tests and Chi-Square tests assessed for differences between participants with and without the indicated CDI/SG type, and r and odds ratios detail the corresponding effect size. Dashes in the test and effect size columns indicate chi-square analyses with insufficient expected cell counts. Descriptive data and inferential tests for demographic and trauma characteristics were based only on available cases. Levels of ethnicity (African American, Hispanic American, other) have been collapsed into the minority status category "non-white." Levels of parent marital status (single, separated/divorced, widowed) have been collapsed into the category "non-married." Levels of victim type (indirect, co-victim) have been collapsed into the category "non-direct." Levels of trauma type (murder, physical assault) have been collapsed into the category "non-sexual assault" while "sexual assault" includes collapsed levels of genital touching, attempted penetration, and actual penetration. Levels of threat/injury (physical injury or life threat, physical injury and life threat, physical injury or life threat, attempted penetration, life threat, or both). * a df = 1,69; n = 71. b df = 1, n = 71. c df = 1, n = 69. d df = 1, n = 68. e df = 1, n = 64. f df = 1, n = 70. g df = 1, n = 64. h df = 1,72; n = 74. *p < .05. **p < .02. ***p ≤ .01.

Table 1b. Demographic, trauma, and treatment characteristics for the entire sample and the participants with and without trauma-related distress sudden gains.

Characteristic	All			First Session			Later			Any		
	SG M = 10.38 SD = 3.37	No SG M = 10.35 SD = 3.44	r or Odds Ratio r = .026	SG M = 9.40 SD = 3.20	No SG M = 11.33 SD = 3.30	r or Odds Ratio F = 6.266**	SG M = 9.86 SD = 3.30	No SG M = 11.22 SD = 3.39	r or Odds Ratio F = 2.783			
Age ^a												
Sex ^b (Female N, %)	44 (62%)	35 (63.6%)	$\chi^2 = .287$	24 (68.6%)	20 (55.6%)	Odds = .735	30 (68.2%)	14 (51.9%)	$\chi^2 = 1.893$	Odds = 1.990		
Minority Status ^c												
White	25 (36.2%)	18 (34.4%)	-	15 (42.9%)	10 (29.4%)		20 (45.5%)	5 (20%)	$\chi^2 = 4.471^*$	Odds = .300		
Non-white	44 (63.8%)	35 (66%)	-	20 (57.1%)	24 (70.6%)		24 (54.5%)	20 (80%)				
Family Income ^d												
Under \$10,000	27 (45.8%)	6 (46.1%)		13 (43.3%)	14 (48.3%)		17 (45.9%)	10 (45.5%)				
\$10,000 - \$19,999	3 (5.1%)	1 (7.7%)		2 (6.7%)	1 (3.4%)		2 (5.4%)	1 (4.6%)				
\$20,000 - \$29,999	19 (32.2%)	4 (30.8%)		13 (43.3%)	6 (20.7%)		14 (37.7%)	5 (22.7%)				
\$30,000 - \$39,999	3 (5.1%)	1 (7.7%)		0	3 (10.3%)		1 (2.8%)	2 (9%)				
\$40,000 - \$49,999	5 (8.4%)	0		2 (6.7%)	3 (10.3%)		2 (5.4%)	3 (13.6%)				
\$50,000 - \$59,999	2 (3.4%)	1 (7.7%)		0	2 (7%)		1 (2.8%)	1 (4.6%)				
Parent/Marital Status ^e												
Married	30 (44.1%)	7 (43.8%)	$\chi^2 = .001$	14 (42.4%)	16 (45.7%)	Odds = 1.020	17 (40.5%)	13 (50%)	$\chi^2 = .591$	Odds = 1.471		
Non-married	38 (55.9%)	9 (56.2%)	-	19 (57.6%)	19 (54.3%)		25 (59.5%)	13 (50%)				
Victim Type ^f												
Direct	49 (70%)	10 (62.5%)	-	24 (70.6%)	25 (69.4%)		29 (67.4%)	20 (74.1%)	$\chi^2 = .347$	Odds = 1.379		
Non-direct	21 (30%)	6 (37.5%)	-	10 (29.4%)	11 (30.6%)		14 (32.6%)	7 (25.9%)				
Trauma Type ^g												
Sexual Assault	45 (66.2%)	10 (66.7%)	-	25 (73.5%)	20 (58.8%)		29 (69%)	16 (61.5%)	$\chi^2 = .405$	Odds = 1.394		
Non-sexual assault	23 (33.8%)	5 (33.3%)	-	9 (26.5%)	14 (41.2%)		13 (31%)	10 (38.5%)				
Perpetrator Type												
Older Child	12 (17.1%)	3 (18.8%)	-	8 (23.5%)	4 (11.1%)		9 (20.9%)	3 (11.1%)				
Stranger	10 (14.3%)	0	-	3 (8.8%)	7 (19.4%)		3 (7%)	7 (25.9%)				
Acquaintance	12 (17.1%)	2 (12.5%)	-	5 (14.7%)	7 (19.4%)		6 (14%)	6 (22.2%)				
Person Known Well	16 (22.9%)	5 (31.2%)	-	8 (23.5%)	8 (22.2%)		11 (25.5%)	5 (18.6%)				
Caretaker/Parent Role	20 (28.6%)	6 (37.5%)	-	10 (29.5%)	10 (27.9%)		14 (32.6%)	6 (22.2%)				
Threat/Injury Level ^h												
Physical injury, life threat, or both	32 (50%)	7 (50%)	$\chi^2 = .000$	14 (43.7%)	18 (56.2%)	Odds = 1.000	15 (37.5%)	17 (70.8%)	$\chi^2 = 6.667^{***}$	Odds = .247		
Neither physical injury nor life threat	32 (50%)	7 (50%)	-	18 (56.3%)	14 (43.8%)		25 (62.5%)	7 (29.2%)				
Abusive Incidents ⁱ												
One	35 (50%)	10 (62.5%)	$\chi^2 = 1.296$	13 (38.2%)	22 (61.1%)	Odds = .517	20 (46.5%)	15 (55.6%)	$\chi^2 = .543$	Odds = 1.438		
More than one	35 (50%)	6 (37.5%)	-	21 (61.8%)	14 (38.9%)		23 (53.5%)	12 (44.4%)				
# of Treatment Sessions ^b	M = 19.85 SD = 9.51	M = 20.09 SD = 9.43	F = .151	M = 23.27 SD = 11.19	M = 16.43 SD = 5.84	F = 10.853***	M = 21.70 SD = 10.74	M = 16.82 SD = 6.09	F = 4.810	r = .250		
CDI at First Session ^b	M = 9.85 SD = 6.8	M = 9.18 SD = 6.94	F = 2.505	M = 9.89 SD = 6.32	M = 9.81 SD = 7.33	F = .003	M = 10.74 SD = 6.41	M = 8.39 SD = 7.27	F = 2.106	r = .169		
CDI at Post ^b	M = 5.15 SD = 5.88	M = 5.76 SD = 5.27	F = .240	M = 5.57 SD = 6.74	M = 4.73 SD = 4.93	F = .372	M = 5.87 SD = 6.42	M = 3.96 SD = 4.73	F = 1.849	r = .158		
IES at First Session ^b	M = 32.08 SD = 16.75	M = 29.79 SD = 14.60	F = 4.894	M = 35.76 SD = 15.94	M = 28.41 SD = 16.93	F = 3.697	M = 35.72 SD = 15.59	M = 26.11 SD = 17.13	F = 6.136**	r = .280		
IES at Post ^b	M = 17.96 SD = 16.33	M = 20.65 SD = 17.54	F = .594	M = 19.46 SD = 15.27	M = 16.46 SD = 17.41	F = .621	M = 19.67 SD = 15.93	M = 15.14 SD = 16.89	F = 1.346	r = .135		

Note. First Session = sudden gain (SG) experienced between the first (session 1) and second (session 2 or 3) administration of the Impact of Events Scale (IES). Later = at least one SG experienced on the IES during treatment, excluding those that defined as First Session gains. Any = any SG (either First Session, Later, or both) experienced on the IES during treatment. Values in the SG columns include only participants who experienced the indicated type of IES SG. Values in the No SG column include participants who did not experience the indicated type of IES SG during treatment. F-tests and Chi-Square tests assessed for differences between participants with and without the indicated IES SG type, and r and odds ratios detail the corresponding effect size. Dashes in the test and effect size columns indicate chi-square analyses with insufficient expected cell counts. Descriptive data and inferential tests for demographic and trauma characteristics were based only on available cases. Levels of ethnicity (African American, Hispanic American, other) have been collapsed into the minority status category "non-white." Levels of parent marital status (single, separated/divorced, widowed) have been collapsed into the category "non-married." Levels of victim type (indirect, co-victim) have been collapsed into the category "non-sexual assault", while "sexual assault" includes collapsed levels of genital touching, attempted penetration, and actual penetration. Levels of threat/injury (physical injury or life threat, physical injury and life threat) have been collapsed into the category "non-direct." Levels of trauma type (murder, physical assault) have been collapsed into the category "non-sexual assault", while "sexual assault" includes collapsed levels of genital touching, attempted penetration, and actual penetration. Levels of threat/injury (physical injury or life threat, physical injury and life threat) have been collapsed into the category "neither physical injury nor life threat", while "sexual assault" includes collapsed levels of genital touching, attempted penetration, and actual penetration. *p < .05. **p < .02. ***p < .01.

Pregain Session	Frequency	%	Cumulative Frequency	Cumulative %
1	8	25.00%	8	25.00%
3	6	18.75%	14	43.75%
5	2	6.25%	16	50.00%
6	4	12.50%	20	62.50%
10	3	9.38%	23	71.88%
12	1	3.13%	24	75.00%
16	1	3.13%	25	78.13%
17	1	3.13%	26	81.25%
20+	6	18.75%	32	100.00%

Pregain Session	Frequency	%	Cumulative Frequency	Cumulative %
1	17	25.37%	17	25.37%
2	7	10.45%	24	35.82%
3	4	5.97%	28	41.79%
4	2	2.99%	30	44.78%
6	4	5.97%	34	50.75%
7	2	2.99%	36	53.73%
8	1	1.49%	37	55.22%
9	4	5.97%	41	61.19%
10	3	4.48%	44	65.67%
11	3	4.48%	47	70.15%
14	3	4.48%	50	74.63%
15	1	1.49%	51	76.12%
16	2	2.99%	53	79.10%
17	2	2.99%	55	82.09%
19	2	2.99%	57	85.07%
20+	10	14.93%	67	100.00%

Note. CDI = Children's Depression Inventory. IES = Impact of Events Scale.

Table 3. Patterns of Sudden Gains on the CDI and IES

Gain Status	N	% of total sample (N = 74)
None	22	29.73%
Any	52	70.27%
Gain Pattern	N	% of gainer sample (N = 52)
CDI First Session	0	0
CDI Later	5	9.62%
IES First Session	6	11.54%
IES Later	17	32.69%
CDI First Session & CDI Later	1	1.92%
IES First Session & IES Later	3	5.77%
CDI First Session & IES First Session	2	3.85%
CDI Later & IES Later	10	19.23%
CDI First Session & IES Later	2	3.85%
IES First Session & CDI Later	1	1.92%
CDI First Session, IES First Session, & IES Later	2	3.85%
CDI Later, IES First Session, & IES Later	2	3.85%
CDI First Session, CDI Later, IES First Session, & IES Later	1	1.92%

Note. Categories above are mutually exclusive and depict only the presentation patterns of gains evidenced by those sampled. Order of gains listed does not speak to order in which gains occurred in treatment. CDI = Children's Depression Inventory. IES = Impact of Events Scale.

Sudden Gain Type	N (%)	N (%) with a Reversal	N (%) of Reversers with a Regain
CDI First Session	8 (100%)	3 (38%)	3 (100%)
CDI Later	20 (100%)	9 (45%)	6 (30%)
One	17 (85%)	6 (35%)	3 (50%)
Multiple	3 (15%)	3 (100%)	3 (100%)
IES First Session	17 (100%)	9 (53%)	6 (67%)
IES Later	37 (100%)	23 (62%)	14 (38%)
One	25 (68%)	11 (44%)	5 (45%)
Multiple	12 (32%)	12 (100%)	9 (75%)

Note. Categories above are not mutually exclusive. CDI/IES First Session = sudden gain experienced between the first (session 1) and second (session 2 or 3) administration of either the Children's Depression Inventory (CDI) or Impact of Events Scale (IES). CDI/IES Later = sudden gain experienced on the CDI/IES during treatment, excluding those defined as First Session gains. Reversal = at any point after a gain, an individual's score returning to or exceeding the mean of the pregain and postgain session scores. Regain = of those who experienced reversals, participants who returned to within 50% of the improvement achieved during the original gain by the final treatment session.

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