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The Shape of Depressive Symptom Change: Comparing Sudden and Gradual Gains in Routine Practice

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**The Shape of Depressive Symptom Change: Comparing Sudden and Gradual Gains in
Routine Practice**

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Abstract

Sudden gains, or rapid symptom reductions between two consecutive sessions, have been shown to predict better psychotherapy outcomes, especially for depression (e.g., Shalom & Aderka, 2020). However, several gaps remain in the existing literature on sudden gains, including underrepresentation of naturalistic studies and the circularity critique that it is tautological to examine symptom reduction during treatment as a predictor for overall pre to post-treatment symptom improvements. Furthermore, little is known about whether and which extra-therapeutic factors, or factors that exist within a client's life outside treatment, are associated with sudden gains. To address these gaps, the current study examined the impact of reversed and unreversed sudden gains on treatment outcomes and the association between social conflicts experienced during treatment period and sudden gains, using records review data from a naturalistic sample of 233 depressed adult clients at a university-based psychology training clinic. To address the circularity critique, clients with sudden gains were compared to those with *gradual gains*, or symptom reductions across multiple sessions that are of a similar magnitude to sudden gains. Results showed that clients with unreversed sudden gains experienced significantly greater pre- to post-treatment reductions in depression symptoms than those with reverse sudden gains or gradual gains. However, there were no group differences on treatment outcomes based on quality of life. The degree of social conflicts during the treatment period were not significantly associated with sudden gains. The present findings inform more nuanced understanding of the sudden gains effects and provide implications for how the phenomenon can be leveraged to optimize treatment length and outcomes

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The Shape of Depressive Symptom Change: Comparing Sudden and Gradual Gains in Routine Practice

Psychotherapy outcomes are often examined as a linear and consistent change from before to after treatment. However, theories and empirical evidence on the psychotherapy change process suggest otherwise (Elliott, 2010; Hayes et al., 2007; Hayes & Strauss, 1998; Salvatore & Tschacher, 2012; Shalom & Aderka, 2020). Sudden and rapid progress can occur at specific time points during treatment and has been shown to have a positive effect on treatment outcome (Shalom & Aderka, 2020). According to the dynamic systems theory, which is a multidisciplinary framework used to conceptualize change (Thelen & Smith, 1994), change is a result of a multitude of factors interacting over time. Due to the complexity of such a system, both the rate and the directionality of change are variable (Hayes et al., 2007). Within the context of therapy, this implies that the dynamic interaction between factors such as client characteristics, therapist characteristics, therapeutic variables (i.e., what occurs during therapy), and extra-therapeutic variables (i.e., what occurs in the client's life outside therapy) determines the course of change (Hayes et al., 2007; Salvatore & Tschacher, 2012). Due to the complexity of the interaction between those factors, the trajectory of symptom change in therapy is often nonlinear and inconsistent.

Critical fluctuations are one type of an inconsistent change identified within the dynamic systems theory. During critical fluctuations, challenges which overwhelm a preexisting system destabilize the system. This triggers a period of rapid changes as a new, more adaptive system replaces the previous system, which deteriorates after destabilization (Hayes et al., 2007). While therapy provides a stable environment in which to approach a change, many interventions are intended to disrupt and challenge old patterns that maintain psychopathology (Salvatore &

Tschacher, 2012). This disruption to symptom patterns can lead to sudden and rapid progress at specific time points and result in sustained positive treatment outcomes (Caspar et al., 1992; Fisher & Newman, 2016; Greenberg et al., 1996; Newman & Fisher, 2013; Tschacher et al., 1992). For example, exposure-based interventions are designed for a client to confront feared stimuli and elicit unpleasant emotions in order to challenge avoidant coping mechanisms for emotional distress. In this way, a period of destabilization (e.g., confrontation of feared stimuli and increased emotional distress) overwhelms a preexisting system (e.g., avoidant coping) and triggers rapid change as adaptive systems (e.g., willingness to approach feared stimuli) develop (Hayes et al., 2007). Given the complex processes of change observed during treatment and the theorized impact of such fluctuations on overall treatment outcomes, it is important to explore specific elements of symptom changes that occur during treatment.

Sudden gains, defined as rapid symptom improvements between two consecutive sessions, are one such form of a nonlinear change. Sudden gains were first operationalized and identified in a sample of depressed clients by Tang & DeRubeis (1999). To qualify as a sudden gain, the symptom change between two consecutive sessions must be large in absolute terms, represent at least a 25% reduction from the pre-gain level of symptoms, and is a stable reduction (i.e., symptom levels in the three sessions following the gain are significantly lower than the symptom levels in the three sessions before the gain) (Tang & DeRubeis, 1999). Many replication studies (e.g., Greenfield et al., 2011; Tang et al., 2002, 2005, 2007; Wucherpfennig et al., 2017) supported Tang and DeRubeis' original findings (1999), demonstrating that many clients experienced at least one sudden gain during treatment and that sudden gains had a positive effect on overall treatment outcomes. Based on a meta-analysis of studies on sudden gains published over the past two decades (Shalom & Aderka, 2020), sudden gains occurred in

about 35% of clients at least once during the course of treatment. Additionally, the meta-analysis revealed that clients who experienced sudden gains improved from pre- to post-treatment significantly more than those without sudden gains. The group difference was of a medium effect size. The association between sudden gains and better treatment outcomes was consistent across different treatment modalities (e.g., cognitive behavioral therapy, interpersonal therapy, supportive therapy). However, diagnoses moderated the association such that the positive effect of sudden gains on treatment outcomes was stronger in treatments that targeted either depression or anxiety disorders (e.g., panic disorder) than in treatments for diverse disorders (e.g., transdiagnostic treatments). Furthermore, a majority of studies examining the effect of sudden gains on treatment outcomes have targeted depression (42.11% of studies included in the meta-analysis). Perhaps this is due to the fact that sudden gains were first operationalized and identified in a sample of depressed clients (Tang & DeRubeis, 1999). It is of note that the frequency of sudden gains across studies using samples of depressed clients was about 40%, a slightly higher prevalence compared to the overall prevalence across disorders.

Sudden gains are sometimes followed by a pattern of decomposition, which has been studied as another element of the nonlinear trajectory of a symptom change in psychotherapy. The pattern of symptom deterioration following sudden gains is called a *reversal* and is operationally defined as the loss of 50% or more of a sudden gain, which occurs at any point during the treatment period following the sudden gain (Tang & DeRubeis, 1999). According to the recent meta-analysis (Shalom & Aderka, 2020), about 30% of clients who experienced sudden gains subsequently experienced reversals at any point in the remaining duration of treatment. The subset of depressed clients who experienced reversals was also about 30%. Across studies, reversals were found to change the effect of sudden gains on treatment outcomes

such that when reversals occurred, the association between sudden gains and positive treatment outcomes became attenuated (Shalom & Aderka, 2020). Therefore, it is important to assess and account for reversals when examining sudden gains in order to gain more precise understanding of how those different patterns of nonlinear symptom changes are associated with treatment outcomes.

Despite the overall support for the clinical importance of sudden gains and reversals, there exist several gaps in the current literature. First, sudden gains have been mostly examined using data from controlled treatment trials, and fewer naturalistic studies on sudden gains and reversals exist. Based on the recent meta-analysis (Shalom & Aderka, 2020), 16 studies on sudden gains were conducted using data collected naturalistically compared to 32 studies using data from controlled treatment trials. Closer inspection of the naturalistic studies included in the meta-analysis revealed variability in data collection methods, which has implications for generalizability and ecological validity of the prior findings. In some naturalistic studies, individuals presenting to outpatient clinics were screened and selected for research study inclusion prior to the onset of treatment (Aderka et al., 2012; Adler et al., 2013; Clerkin et al., 2008; Hardy et al., 2005; Haugen et al., 2015; Stiles et al., 2003). In those studies, clients' awareness that treatment data would be used for research on symptom change patterns could have resulted in social desirability or expectancy effects, biasing the client's responses on self-report symptom measures. In addition, treatment for the selected clients typically differed from the standard care such that; (a) clinicians followed manualized treatment protocols (Aderka et al., 2011; Clerkin et al., 2008; Hardy et al., 2005) and (b) clinicians administered additional measures beyond those used in routine practice at the clinic housing the study (Aderka et al., 2011; Adler et al., 2013; Doss et al., 2011). Such study designs could have compromised external

validity of findings, not fully capturing the naturally occurring variability and complexity in how treatments are implemented in actual, “real-life” clinical settings.

There have been four naturalistic studies of sudden gains which used patient records data collected as a part of standard, clinic-wide routine outcome monitoring procedures (Greenfield et al., 2011; Lutz et al., 2013; Stiles et al., 2003; Wucherpennig et al., 2017). Studies based on patient records review in routine care conditions encompass data of all clients seen at the clinic and reflect truly naturalistic treatments wherein research protocols did not affect treatment decisions. Therefore, patient records review studies can provide a more rigorous test of whether the prior findings from controlled clinical trials replicate in routine care conditions. Prior records review studies demonstrated that while sudden gains had a significant positive effect on treatment outcomes, the effect sizes were smaller (Stiles et al., 2003; Wucherpennig et al., 2017), and sudden gains were more often followed by reversals (Greenfield et al., 2011) than previously observed in controlled treatment trials. Given the small number of existing records review studies on sudden gains and the emerging evidence that the effects of sudden gains might differ in routine clinical care settings relative to controlled treatment trials, further naturalistic investigation using patient records review data is warranted.

In addition, there has been a critique about the potential circularity in the association between sudden gains and treatment outcomes. Most prior studies compared clients who experienced sudden gains to clients who did not experience any sudden gains. By definition, clients in the sudden gains group have improved during treatment and would likely demonstrate greater symptom reduction from pre- to post-treatment than those in the non-sudden gains group, or those who did not experience sudden gains. For this reason, better treatment outcomes in the sudden gains group may simply reflect an artifact of sudden gains, where gains lead to gains.

One way to address the critique is to include an additional measure of an overall treatment outcome that is separate from the measure used to assess sudden gains. For instance, if sudden gains are assessed using a measure of depression severity, overall treatment outcomes can be examined with the same measure as well as additional measures assessing quality of life or psychosocial functioning. The prior studies that have included secondary measures typically included measures of the same construct as the primary measure, or measures of other mental health symptoms that were not the direct target of treatment (Shalom & Aderka, 2020). For example, if the primary measure of treatment outcome was the Beck Depression Inventory-II the secondary measure would be the Beck Anxiety Inventory (Hopko et al., 2009). The present study is unique in that the secondary measure assesses a construct of psychosocial functioning rather than additional symptoms. Another approach is to use a more robust comparison group than the non-sudden gains group. The non-sudden gains group subsumes heterogeneous clients, such as those who did not respond to treatment (i.e., no significant symptom change), deteriorated in treatment, or experienced gradual gains over the course of treatment. *Gradual gains* are defined by symptom reductions across three or more sessions as opposed to symptom reductions of an equal or similar magnitude occurring suddenly between two consecutive sessions (i.e., sudden gains). Comparing clients with gradual gains and those with sudden gains addresses the circularity critique and can determine whether the suddenness of symptom reductions has an additional benefit beyond simply experiencing any symptom reductions during the treatment phase. Despite the advantages of employing the gradual gains control group, few studies have employed this methodology (Greenfield et al., 2011; Hedman et al., 2014). Treatment outcomes were better for clients who experienced sudden gains than those who experienced gradual gains, suggesting that rapid gains over a brief period of time were more advantageous than the same

magnitude of gains spread across a longer period (Greenfield et al., 2011; Hedman et al., 2014). However, prior studies focused on a diagnostically heterogeneous sample (Greenfield et al., 2011) or clients with health anxiety (Hedman et al. 2014). Therefore, it remains unknown whether similar results would be found in clients presenting with other clinical problems, such as depression. The paucity of research on gradual gains also calls for replication of the prior findings in other clinical samples.

Another gap in the literature is that it remains poorly understood which factors precipitate sudden gains. In studies of cognitive therapy for depression, cognitive changes in clients preceded sudden gains (Tang & DeRubeis, 1999; Tang et al., 2005), yet these findings were not replicated in other studies of cognitive behavioral interventions (Kelly et al., 2005). Given that sudden gains are observed across treatment modalities, transtheoretical factors have also been examined as possible precipitants to sudden gains. Elevated levels of hope (Abel et al., 2016), insight (Goodridge & Hardy, 2009), and treatment engagement (Doane et al. 2010) have been observed during sessions preceding sudden gains although these findings were not consistently replicated (Vincent & Norton, 2019). While these treatment-related factors have only been marginally studied, even less is known about the impact of extra-therapeutic factors, or factors that exist within an individual's life outside treatment such as life stressors, on sudden gains. It is well established that life stressors often precede episodes of depression (Hammen, 2005; Monroe et al., 2019; Monroe & Harkness, 2005) and are related to poorer treatment outcomes in depressed clients (Buckman et al., 2022). However, the impact of life stressors on the trajectory of symptom change during treatment remains understudied. To the best of my knowledge, only one study has examined the impact of life stressors on sudden gains and did not find a significant association (Hardy et al., 2005). However, this study operationalized stressful life events based

on a unipolar rating on the perceived quality (e.g., “good” or “bad”) of specific life events and did not assess specific stressors. Evidence also suggests that interpersonal stress, or social conflict, can have an especially potent impact on mental health, for instance, heightening the risk for depression compared to other types of life stress (Cohen et al. 2019). In addition, people with depression were shown to be more sensitive to daily social conflict than other types of stress related to one’s profession, academics, or health (Sheets & Armev, 2020). Given the association between social conflict and depression symptoms, it is possible that heightened levels of social conflict during the treatment period may reduce the likelihood of sudden gains, or rapid symptom improvements.

The current study aimed to address the aforementioned gaps in the sudden gains literature by using record review data of depressed clients who were treated at a community-based, outpatient mental health clinic. The use of naturalistic data helped to clarify whether the prior results largely based on randomized controlled trials generalize to real-life practice settings. The current study aims were twofold. First, the study examined the association between the presence of sudden gains and overall treatment outcomes while accounting for the reversal of sudden gains. To address the circularity critique, overall treatment outcomes were examined based on both symptom severity (depressive symptoms) and quality of life while sudden gains were assessed based on changes in the symptom severity. In addition, clients with gradual gains were identified and used as a comparison group for clients with sudden gains. Specifically, pre- to post-treatment changes in depressive symptom severity and quality of life were compared between the three groups: *unreversed sudden gainers* (clients with sudden gains and no reversals), *reversed sudden gainers* (clients with sudden gains and reversals), and *gradual*

gainers (clients with gradual gains)¹. It was hypothesized that unreversed sudden gainers would experience greater pre- to post-treatment improvement in depression symptom severity and quality of life compared to reversed sudden gainers and gradual gainers. The second aim of the study was to extend the limited research on the effect of extra-therapeutic variables on sudden gains by examining the association between social conflict and the presence of sudden gains. It was hypothesized that unreversed sudden gainers, reversed sudden gainers, and gradual gainers will experience lower levels of social conflict on average across the treatment period than non-gainers. In addition, it was expected that among the three groups with symptom reduction during treatment, unreversed sudden gainers would experience lower levels of social conflict during treatment than reversed sudden gainers and gradual gainers.

Methods

Participants

233 clients who received psychotherapy between 2016 and 2020 at a university-based psychology training clinic affiliated with a doctoral program in clinical psychology, which provides outpatient mental health services to the campus and outside communities, were deemed eligible for research inclusion. Eligibility was determined by reviewing the clinic's deidentified TOP records which are stored as a password protected electronic file. TOP records of depressed clients were extrapolated from the general clinic records for previous research based on the same eligibility criteria for the proposed study and thus, this preexisting dataset will be utilized. While client progress and outcome data were collected primarily for clinical use, all clients provided informed consent to the potential use of their data for future research purposes at the onset of

¹ A fourth group, non-gainers (those with neither sudden nor gradual gains), is excluded from this analysis given the critique that it is tautological to compare non-gainers to sudden gainers or gradual gainers on pre- to post-treatment symptom reduction.

treatment. This study employed archival data and thus, it was exempt from IRB review. In accordance with the clinic-wide internal screening process, individuals were referred elsewhere if they were in an imminent suicidal crisis or demonstrated symptoms of psychosis. Client data were included in the present study if the assessment at pre-treatment indicated clinically elevated levels of depression (i.e., ≥ 1.51 SDs above the general population mean on the Treatment Outcome Package depression scale scores; Kraus & Seligman, 2004), and the client completed a minimum of four weekly outcome measures, which is required for identifying sudden gains.

Providers were 112 doctoral or postdoctoral level therapists in training. The majority of providers were second year students (33.04%) studying at the university in which the training clinic is based. Third year (8.93%), fourth year (7.14%) and fifth year (0.89%) students at the university also provided psychotherapy to clients included in the present sample. Other providers included doctoral student interns (20.54%), doctoral student externs (17.86%), and post-doctoral fellows (10.71%). Each provider saw 2.08 clients on average ($SD=1.27$). The current clinic specialized in providing cognitive behavioral therapy (CBT), and treatment provided by trainee clinicians were supervised by licensed psychologists with expertise in CBT. The clinic housed eight supervisors each training year that data was collected. Each trainee therapist received one hour of weekly supervision at minimum. Various lengths of treatment and protocols were used depending on the presenting problems and needs of each client.

Measures

Treatment Outcome Package (TOP)

As part of routine outcome monitoring, clients completed the Treatment Outcome Package (TOP; Boswell et al., 2015; Kraus et al., 2005) at the beginning of treatment as well as weekly before each therapy session. The self-report measure was electronically administered via

an online, HIPAA-compliant survey platform. The present study used de-identified TOP records collected between January 1, 2016 and November 13, 2020.

The TOP is a behavioral health assessment and outcome battery designed for clinical and research use in naturalistic settings. The self-report measure assesses demographic variables, case-mix variables, and a range of behavioral health symptoms and functioning (Boswell et al., 2015). Demographic variables and case-mix variables are assessed once at the beginning of treatment. Behavioral health symptoms and functioning are assessed at the beginning of each therapy session based on 58 Likert scale items. Items assess global symptom severity as well as symptoms and functionality during the past two weeks across 12 clinical scales: work functioning, sexual functioning, social conflict, depression, panic (somatic anxiety), psychosis, suicidal ideation, violence, mania, sleep, substance abuse, and quality of life (Kraus et al., 2005). Items are rated on a 6-point Likert scale ranging from 1 (*All*) to 6 (*None*). Raw scores are standardized (i.e., z-scores) through adjustment for case mix variables (e.g., serious life events and medical illness in the past 12 months) and benchmarking against non-clinical populations. The score of zero represents the general population average, positive standard deviations represent heightened impairment or symptom severity, and negative standard deviations represent elevated functioning or potential strengths (Boswell et al., 2015).

The current study used three clinical scales from the TOP: depression, quality of life, and social conflict (see Appendix A). The depression scale consists of ten items that measure the presence and severity of depression symptoms (i.e., feeling down or depressed, anhedonia, guilt, restlessness, worthlessness, lethargy, worry, difficulty concentrating or making decisions, racing thoughts, and suicidal ideation). The quality of life scale consists of four items assessing the degree to which clients felt satisfied with various areas of their lives (i.e., relationships with

others, daily responsibilities, general mood and feelings, and life in general). The social conflict scale includes five items that measure interpersonal functioning and conflicts and subjective experiences of one's social landscape (i.e., "felt too much conflict with someone", "been emotionally hurt by someone", "felt someone else had too much control over your life", "felt sexually incompatible with your partner or frustrated by the lack of a partner", "worried that someone might hurt you"). In a prior sample of 19,801 adults patients treated in 383 different behavioral health services across the United States who completed the TOP at intake as part of standard treatment, (Kraus et al., 2005), the three scales demonstrated excellent internal consistency (depression scale alpha = .93, quality of life scale alpha = .85, social conflict scale alpha = .72) and test-retest reliability (depression scale ICC = .93, quality of life scale ICC = .93, social conflict scale ICC = .93). The three scales also showed strong convergent validity and sensitivity to change based on the Reliable Change Index (Boswell et al., 2015; Jacobson & Truax, 1991; Kraus et al., 2005; Youn et al., 2012). Criterion validity has also been established based on the scales' ability to discriminate between members of the general population and clinical samples (Kraus et al., 2005). The depression scale scores from weekly TOP administration were used to assess the presence of sudden gains, reversals, and gradual gains in depressive symptoms during treatment. Treatment outcomes (i.e., change from pre- to post-treatment) were measured based on the depression and quality of life scale scores from the first and last sessions for each client. The average of weekly scores on the social conflict scale were used to assess average levels of social conflict during treatment.

Data Analysis

Missing Data

The percentages of missing data for study variables were minimal: 0.70% for quality of

life, 0.90% for depression, and 2.42% for social conflict. Little's Missing Completely At Random (MCAR) test result was not significant, $\chi^2(1507, N = 233) = 1249.67, p = 1.00$, suggesting that there was no systematic pattern to missing data, and data were missing at chance. Missing data are of particular significance to the third criterion for sudden gains given the need for the three scores before and after a sudden gain to determine if symptom reduction is stable. Some researchers replaced missing values using the last observation carried forward or multiple imputation, yet these methods have the potential to inflate instances of sudden gains (Shalom et al., 2018; Tang et al., 2007; Wiedemann, Thew, et al., 2020). In an effort to avoid the artifact, the current study used an alternative method, where critical t values for the calculation of sudden gains are adjusted to be more conservative in the case of missing data. This method has been used in several prior studies on sudden gains (Wiedemann, Stott, et al., 2020; Wiedemann, Thew, et al., 2020; Wucherpfennig et al., 2020). For primary analyses testing group comparisons, pairwise deletion was used given the small missing data and the non-significant MCAR test.

Group Assignment

Clients were classified into one of four groups based on the patterns of change in TOP depression scale scores during treatment: *unreversed sudden gainers* (clients with sudden gains and no reversals), *reversed sudden gainers* (clients with sudden gains and reversals), *gradual gainers* (clients with gradual gains), and *non-gainers* (those with neither sudden nor gradual gains). Consistent with the convention in the sudden gains literature (Shalom & Aderka, 2020), sudden gains, reversals, and gradual gains were operationalized dichotomously to indicate whether a client experienced each pattern of symptom changes at least once during treatment. It is of note that the presence of at least one sudden gain disqualified a client from the gradual gains group even if a gradual gain was also present (Greenfield et al., 2011). The *suddengains R*

package (Wiedemann et al., 2020) was used to identify sudden gains and reversals using the criteria developed by Tang and DeRubeis (1999) as outlined below.

Sudden Gain. Sudden gains require symptom reduction between two consecutive psychotherapy sessions that meet the following three criteria: 1) The gain must be large in absolute terms as determined by the Reliable Change Index (Jacobson & Truax, 1991). The RCI determines if the observed change can be attributed to factors beyond the measurement or random error (Kraus et al., 2005). In the case of TOP scales, the reliable change score for the depression scale is a decrease in magnitude of at least 1 *z*-score (Kraus et al., 2010). The gain must be large in relative terms as determined by at least a 25% symptom score reduction from the session immediately preceding sudden gains; and 3) The gain must represent a stable reduction where the difference between the three scores before the gain and the three scores after the gain is significant based on a two-tailed paired *t*-test. These criteria were applied to weekly scores on the TOP depression scale to identify the instance of sudden gains over the course of treatment.

Reversal. Sudden gains were considered reversed when 50% or more of the sudden gain improvement was lost at any point during the remainder of treatment.

Gradual Gain. Gradual gains were operationalized based on the criteria used in prior studies (Greenfield et al., 2020; Hedman et al., 2014). The criteria were that: 1) The gain must be large in absolute terms as determined by the RCI and occur over the course of three or more sessions (vs. over two consecutive sessions). As in the case of sudden gains, a client experienced a decrease in magnitude of at least 1 *z*-score on the TOP depression scale; 2) The gain must be large in relative terms as determined by at least a 25% symptom score reduction from the session immediately preceding gradual gains.

Preliminary Analyses

Descriptive analyses were conducted to examine the number of sudden gainers with reversals, sudden gainers without reversals, gradual gainers, and non-gainers within the sample. Groups were mutually exclusive such that if a client demonstrates both sudden gain and gradual gain, the client was classified into one of the two sudden gains groups depending on the presence of a reversal. In other words, the gradual gainers group included only clients with a gradual gain and no sudden gain, and the non-gainers group did not include any clients who experienced a sudden gain and/or a gradual gain. Descriptive analyses were also conducted to determine the number of clinicians at each level of training level and the number of clients seen by each clinician. Bivariate correlation analyses were also conducted to examine correlations between pre-treatment levels of three outcome measures from the TOP (depression, quality of life, and social conflicts).

Primary Analyses

Two-way repeated measures analyses of covariance (ANCOVAs) were conducted to determine differences between the three gains groups (i.e., reversed sudden gainers, unreversed sudden gainers, and gradual gainers) in their treatment outcomes. The non-gainers group was not compared to the other three groups due to the circularity of such analyses (Greenfield et al., 2011). The group status was the between-subjects independent variable, time (pre-treatment, post-treatment) was the within-subjects independent variable, and depression and quality of life scores were the dependent variables. Given the variability in treatment duration across groups, the number of sessions was included as a covariate. In the case of a significant group effect, post-hoc analyses with Bonferroni correction were conducted for pairwise comparisons between groups. Cohen's d was used to examine the effect sizes for between-group differences as well as

pre-to post-treatment changes within groups.

A one-way analysis of variance (ANOVA) was conducted to compare average levels of social conflict experienced during the treatment period between the four groups: reversed sudden gainers, unreversed sudden gainers, gradual gainers, and non-gainers. The group status was the between-subjects independent variable, and average social conflict scores across the treatment period was the dependent variable. Post-hoc analyses with Bonferroni correction were conducted for pairwise comparisons between groups. Cohen's *d* was calculated to examine effect sizes for between-group differences.

Results

Sample Characteristics

Table 1 presents sample-level and group-level demographic and clinical characteristics. Clients were aged between 18 and 68 years, with a mean age of 24.70 ($SD = 8.50$). A little more than half of clients ($n = 130, 55.79\%$) identified as female, 99 (42.49%) identified as male, three identified as transgender (1.29%), and one (0.43%) identified as non-binary. The majority of clients ($n = 160, 69.87\%$) identified as heterosexual, 45 (19.65%) identified as bisexual, 11 (4.80%) identified as gay or lesbian, and 12 (5.24%) stated they were not sure about their sexual orientation. Most clients ($n = 213, 91.42\%$) identified as single, 18 (7.73%) as married, and two (0.90%) as divorced. The sample included 169 Caucasian (73.80%), 38 Asian (16.59%), 11 Hispanic (4.80%), four East Indian (1.75%), and three African American clients (1.31%). Four clients (1.75%) selected "other" for their race/ethnicity. A half of the sample ($n = 117, 50.21\%$) identified as full-time students, 43 (18.45%) as employed part-time, 35 (15.02%) as employed full-time, 33 (14.16%) as unemployed, four (1.72%) as retired, and one (0.43%) as working but not for money. The majority of clients ($n = 114, 65.14\%$) reported their annual income to be

under \$100,000. Forty eight clients (27.43%) reported their annual income to be between \$100,00-\$200,000, and 13 clients' annual income (7.43%) was reported to be over \$200,000. About a half of clients ($n = 123$, 52.79%) were taking prescribed psychiatric medications at the time of seeking therapy, with the number of medications ranging from one to six ($M = 1.01$, $SD = 1.27$). The average number of completed therapy sessions in the sample was 15.33 ($SD = 9.98$)

When examining group differences on demographic and clinical characteristics, the number of completed therapy sessions significantly varied between groups, $F(3,229) = 6.61$, $p < .001$. Based on Bonferroni post-hoc tests for pairwise comparisons, reversed sudden gainers ($M = 24.00$, $SD = 9.71$) attended significantly more therapy sessions than unreversed sudden gainers ($M = 15.79$, $SD = 12.66$), gradual gainers ($M = 14.56$, $SD = 10.06$), and non-gainers ($M = 13.88$, $SD = 7.78$), $ps < .05$, $ds = 0.73-1.15$. Differences between unreversed sudden gainers, gradual gainers, and non-gainers were not significant, $ps = .72-.97$, $ds = 0.08-0.18$. The four groups did not differ on other demographic and clinical characteristics, $ps = .32-.84$ (see Table 1).

Prevalence of Sudden Gains, Reversals, and Gradual Gains

Out of 233 clients, 60 clients (25.80%) experienced sudden gains over the course of treatment. Average number of sudden gains experienced was 1.13 ($SD = 0.39$), and the majority of clients experiencing sudden gains ($n = 53$, 88.33%) had one instance of sudden gain. The mean number of sessions it took for the first sudden gain to occur was 8.00 ($SD = 10.83$, range = 4-62). Six clients (10.00%) experienced two sudden gains, the second of which occurred on average at session 15 ($SD = 8.39$, range = 5-27). On average, there were 10.71 ($SD = 7.74$) sessions between the first and second sudden gain. One client (1.70%) experienced three sudden gains, and the third sudden gain occurred at session 20, with six sessions between the second and third sudden gain. The median session at which all sudden gains occurred was 5.5, and the mode

was 2. More than half of all sudden gains (58.82%) occurred within the first half of treatment. The average magnitude of sudden gains, which indicates the degree to which depression symptom severity (i.e., z -scores) decreased as a result of a sudden gain, was 1.86 ($SD = 0.68$). Of the 60 clients with sudden gains, about a third, or 21 clients (9.00% of the sample) experienced a reversal of sudden gains (“reversed sudden gainers”), and the remaining 39 (16.70% of the sample) did not (“unreversed sudden gainers”). The average magnitude of reversals, also calculated using z -scores, was 1.85 ($SD = 0.96$). Of the 21 reversed sudden gainers, 17 experienced a reversal after their first sudden gain, two experienced reversals after their second sudden gain, and two experienced reversals after both their first and second sudden gain. In addition, 73 clients (31.30%) experienced gradual gains during the treatment period (“gradual gainers”). The average magnitude of gradual gains calculated using z -scores for the sample was 1.85 ($SD = 0.94$). The remaining 100 clients (42.90%) did not meet the criteria for either sudden gains or gradual gains (“non-gainers”).

Correlations Between Pre-Treatment Levels of Outcomes

Pre-treatment scores on depression and quality of life scales, $r(231) = 0.43, p < .001$, depression and social conflict scales, $r(231) = 0.34, p < .001$, and quality of life and social conflict scales, $r(231) = 0.19, p = .005$, were all found to be significantly positively correlated.

Group Comparisons on Treatment Outcomes

Depression Symptoms

Based on a repeated-measures ANCOVA, the effect of time was significant, indicating reduction in depression symptom severity from pre- ($M = 2.95, SD = 1.09$) to post-treatment ($M = 1.26, SD = 1.52$) across groups, $F(1, 129) = 35.75, p < .001, \eta_p^2 = .22$. The effect of group was also significant, $F(2, 129) = 4.23, p = .02, \eta_p^2 = .06$. Based on Bonferroni post-hoc tests for

pairwise comparisons, there was a significant difference in aggregated depression scores across pre- and post-treatment between unreversed sudden gainers ($M = 1.71, SD = .85$) and gradual gainers ($M = 2.32, SD = 1.19$), $p = .01, d = 0.59$. Other pairwise comparisons were non-significant, $ps = .43-1.00$. The interaction between time and group was significant, $F(2, 129) = 10.78, p < .001, \eta_p^2 = .14$ (see Figure 1). Based on simple slope analyses, all three groups achieved significant improvements in depression from pre- to post-treatment, $ps < .001$. However, based on simple contrasts with Bonferroni correction, whereas the three groups did not significantly differ on their depression levels at pre-treatment, $ps = 1.00$, significant group differences emerged at post-treatment. Unreversed sudden gainers ($M = 0.26, SD = 0.88$) had significantly lower depression levels than reversed sudden gainers ($M = 1.37, SD = 1.28$), $p = .02, d = 1.01$, and gradual gainers ($M = 1.55, SD = 1.74$), $p < .001, d = 0.94$. In sum, unreversed sudden gainers improved on depression from pre- to post-treatment to a greater degree than reversed sudden gainers and gradual gainers (see Table 2).

Quality of Life

Based on a repeated measures ANCOVA, the effect of time was significant, indicating improvement in quality of life from pre- ($M = 2.46, SD = .97$) to post-treatment ($M = 1.91, SD = 1.06$) across groups, $F(1, 129) = 9.72, p = .002, \eta_p^2 = .07$. The effect of group was not significant, $F(2, 129) = 0.04, p = .96, \eta_p^2 = .001$. The interaction between time and group was also not significant, $F(2, 129) = 2.29, p < .12, \eta_p^2 = .03$ (see Figure 2). Based on simple slope analyses, all three groups achieved significant improvements in quality of life from pre- to post-treatment, $ps < .001-.04$. However, based on simple contrasts with Bonferroni correction, the three groups did not significantly differ on their quality of life scores at pre-treatment, $ps = 1.00$ or post-treatment, $ps = .89-1.00$ (see Table 2).

Group Comparisons on Social Conflict During Treatment

Results did not indicate significant differences between the four groups (unreversed sudden gainers, reversed sudden gainers, gradual gainers, and non-gainers) on average social conflict levels during the treatment period, $F(3,229) = 0.88$, $p = .45$, $\eta_p^2 = .01$ (see Table 3).

Discussion

The present study aimed to investigate the impact of sudden gains on treatment outcomes as well as the relationship between social conflicts experienced during treatment period, an extra-therapeutic variable, and sudden gains, using a naturalistic sample of depressed adult clients seen at a university-based outpatient clinic. About a quarter of clients (26%) experienced sudden gains, and about a third of those sudden gainers (35%) experienced a reversal. About a third of clients experienced gradual gains (31%) in the current sample while close to a half of clients (43%) did not achieve either sudden or gradual gains. These three groups (unreversed sudden gainers, reversed sudden gainers, and gradual gainers) demonstrated a positive response to treatment in that significant improvements in depression symptom severity and quality of life emerged by the end of treatment. When comparing treatment outcomes between groups, unreversed sudden gainers experienced significantly greater improvements in depression symptom severity than reversed sudden gainers and gradual gainers. However, there were no significant differences between the three groups on the degree of improvements on quality of life. Furthermore, the results did not demonstrate significant differences between reversed sudden gainers, unreversed sudden gainers, gradual gainers, and non-gainers in average levels of social conflicts experienced during treatment. This indicates that the degree of social conflicts was not significantly associated with whether clients experienced gains of any type.

The current study is one of a few naturalistic studies that examined the prevalence and

magnitude of sudden gains among depressed outpatients. In total, 25.80% of clients experienced sudden gains (i.e., rapid and substantial reduction in depressive symptoms). The average magnitude of sudden gains was substantial, indicating a close to 2 *SDs* of a change on average across clients. It is also noteworthy that the majority of sudden gains emerged within the first half of treatment, and the most common number of sessions it took for the first sudden gain to occur was two. This suggests that the phenomenon of sudden gains tends to occur in an early phase of treatment. In the current sample, about a third of clients with sudden gainers experienced a reversal at some point during treatment. For those who experienced a reversal, the average magnitude of reversals was 1.85 *SDs*, indicating that clients' sudden gains were almost completely reversed. While sudden gains in naturalistic samples remain understudied, the effect of sudden gains on treatment outcomes was shown to be consistent across randomized controlled trials and few existing naturalistic studies (Shalom & Aderka, 2020). Both the prevalence and magnitude of sudden gains within the current study are comparable to the prevalence (34.65%) and standardized magnitude ($z = 1.51$) reported in a recent meta-analysis of studies on sudden gains published over the past two decades (Shalom & Aderka, 2020). The prevalence of reversals in the meta-analysis was 31.49%, which was also comparable to results of the present study. Overall, the present findings add to the robust body of evidence that a sizeable portion of clients experience substantial and rapid symptom improvements during treatment.

Current findings expand on the limited literature on gradual gains. In the present sample, about a third of clients experienced gradual gains during treatment, and the average magnitude of gradual gains was close to 2 *SDs*. Prevalence of gradual gains in the current sample was lower than those reported in prior studies (58-62%; Greenfield et al., 2011; Hedman et al., 2014). A number of factors could have contributed to the inconsistent results. For example, one prior study

was a randomized controlled trial of an asynchronous, internet-based cognitive behavioral therapy for health anxiety among participants diagnosed with severe health anxiety (Hedman et al., 2014). The other study (Greenfield et al., 2011) included both clinical and non-clinical samples because there was no symptom severity cut off score that determined eligibility for study inclusion. These differences in the study design and the nature of samples between the current and prior studies may explain the lower prevalence of gradual gains in the current study. At the same time, the limited research on gradual gains suggests that additional studies will help to clarify the general prevalence of this phenomenon and allow for more meaningful comparisons across studies. While the prevalence of sudden gains has been relatively consistent across samples and studies, we cannot draw the same conclusion as to whether this would also be the case for gradual gains given the limited research. Nevertheless, the current findings further support that a subset of clients experience an improvement in their symptoms in a gradual fashion, across multiple therapy sessions.

Non-gainers, a subset of clients who did not respond to treatment, accounted for 42.90% of the current sample. This number appears lower than the average percentage of non-gainers (60%) reported in a meta-analysis of studies on sudden gains (Shalom & Aderka, 2020). However, it is important to note that most of the studies included in the meta-analysis did not identify gradual gainers and combined both gradual gainers and those without any type of gains (sudden or gradual) to define the non-gainers group. Within the studies that defined gradual gainers and non-gainers as separate groups, the percentage of non-gainers were 22.22% (Hedman et al., 2011) and 35.8% (Greenfield et al., 2011). Though these results are closer to the prevalence of non-gainers observed in the present study, they do demonstrate that a higher percentage of clients did not respond to treatment in the current study when compared to prior

studies. These discrepant results could be due to the fact that the two prior studies that identified a gradual gains group did not use samples of depressed clients, but rather, samples of clients with severe health anxiety (Hedman et al., 2014) and diverse disorders (Greenfield et al., 2011). The percentage of clients that did not respond to treatment is somewhat consistent with prior research on treatment resistant depression that indicates that approximately 30% of depressed individuals do not respond to psychotherapy (McIntyre et al., 2023 & Zhdanova et al., 2021). It is striking that such a large portion of clients do not achieve a change in psychotherapy, which indicates substantial room for improvement within the field of psychotherapy to increase response rate.

One of the primary research questions for the present study was whether and how sudden gains were associated with treatment outcomes among depressed adult clients when accounting for reversal of sudden gains. Gradual gainers were used as a comparison group rather than non-gainers to address the circularity critique, which posits that symptom reduction observed during treatment would likely lead to overall symptom reduction from pre- to post-treatment, and thus, it is tautological to examine an association between the two. Results based on a measure of depression symptoms indicated that unreversed sudden gainers, reversed sudden gainers, as well as gradual gainers all experienced significant improvements in depression symptoms from pre-to post-treatment. However, outcomes for clients with unreversed sudden gains were significantly better than outcomes for clients with reversed sudden gains or gradual gains in that the former achieved a significantly greater reduction in depression severity from pre- to post-treatment. These results are consistent with findings reported in the recent meta-analysis of studies on sudden gains, where reversals were found to be a significant moderator between sudden gains and treatment outcomes such that higher reversal rates were associated with smaller effect sizes (Shalom & Aderka, 2020). This could be expected given that reversals, which account for the

erosion of 50% or more of the sudden gain, would reduce the effect on treatment outcome by definition. It appears that not only experiencing sudden gains but maintaining them is what creates lasting impact by the end of treatment. Future research examining predictors of reversals would be valuable given their impact on the relationship between sudden gains and treatment outcomes.

The current results are also consistent with the few existing studies comparing sudden gains to gradual gains. As shown in prior studies (Greenfield et al., 2011; Hedman et al., 2014), unreversed sudden gainers demonstrated greater symptom improvements compared to gradual gainers. The use of gradual gainers, a more robust comparison group than non-gainers, helps to rule out two alternative explanations for the present finding. First, it can be ruled out that the greater improvement in the unreversed sudden gainers was driven by a circular logic where individuals who experienced an improvement during treatment also showed greater pre- to post-treatment changes. Both unreversed sudden gainers and gradual gainers experienced substantial improvements in depression symptoms during treatment. In fact, the inclusion criteria for sudden and gradual gainers required the same degree of improvements (but over different timeframes), and not surprisingly, both groups achieved a comparable degree of symptom improvements during treatment. Therefore, the present results indicate an additional benefit to experiencing rapid symptom reductions during treatment beyond experiencing gradual symptom reductions. In other words, the timeframe of symptom changes during treatment was associated with overall treatment outcomes above and beyond the magnitude of symptom changes. While these findings do not provide direct insights on the possible mechanisms in which sudden gains predict better treatment outcomes, relevant theories have been proposed. The dynamic systems theory, a multidisciplinary framework used to conceptualize change (Thelen & Smith, 1994), suggests that

change is a result of the dynamic interaction between a multitude of factors interacting over time, and that due to the complexity of the interaction between those factors, change is often nonlinear and inconsistent (Hayes et al., 2007). Critical fluctuations, or rapid changes that destabilize a preexisting system, is posited to make way for new, more adaptive systems (Hayes et al., 2007). Within the context of psychotherapy, these disruptions to symptom patterns that happen suddenly seem to be more beneficial than those that occur more gradually. Thus, the dynamic systems theory provides one possible explanation as to why sudden gains have a lasting impact on psychotherapy outcomes even when compared to gradual gains. Additionally, Hedman et al. (2014) posit that sudden gains might be more rewarding which could in turn encourage clients to engage more in treatment and lead to better outcomes by the end of treatment.

Prior studies on sudden gains tended to address the circularity critique by including a secondary measure of overall treatment outcomes (Shalom & Aderka, 2020). The inclusion of a secondary measure ensures that positive treatment outcomes are not simply an artifact of sudden gains, in which gains lead to gains. In the current study, treatment outcomes were examined on the secondary measure of quality of life, which is an individual's subjective perception of their overall well-being in the context of their cultures, values, and life goals (e.g., WHOQOL Group, 1995). Results demonstrated that sudden gains did not have a significant impact on treatment outcomes based on quality of life. While all three gain groups (unreversed sudden gainers, reversed sudden gainers, and gradual gainers) achieved significant improvements in quality of life from pre- to post-treatment, there were no group differences in the degree of improvements. This was contrary to the hypothesis that unreversed sudden gainers would experience greater improvement in quality of life from pre-to post-treatment than the other two groups. In other words, the significant impact of sudden gains on treatment outcomes based on depression

symptoms did not generalize to the secondary measure on quality of life. One possibility is that the effects of sudden gains observed using measures of depression symptom levels did not generalize to broader measures of well-being, such as quality of life. For instance, in the current study, quality of life was assessed based on multiple domains including relationships, daily responsibilities, and general mood and feelings (as opposed to depression assessed based on a specific set of intrapersonal, affective and cognitive symptoms). Previous studies demonstrated that sudden gains had a significant effect on treatment outcomes even when using secondary measures, yet the effect size was much smaller (Shalom & Aderka, 2020). However, secondary measures used in other studies typically assessed other symptomatology (e.g., the Beck Depression Inventory-II was the primary measure, the Beck Anxiety Inventory was the secondary measure; Shalom & Aderka, 2020). Perhaps the effects of sudden gains are more readily observed based on measures of symptom severity and less so on measures of quality of life, which is qualitatively distinct from diagnostic status and symptom severity.

The current study extended a few prior studies examining an association between sudden gains and extra-therapeutic variables, or factors that exist within a client's life outside of treatment. Social conflicts were specifically examined as an extra-therapeutic variable of interest. Based on the existing literature, life stressors often preceded episodes of depression (Hammen, 2005; Monroe et al. 2019; Monroe & Harkness, 2005) and were related to poorer treatment outcomes for depressed clients (Buckman et al., 2022). Furthermore, people with depression tended to be more sensitive to interpersonal stressors such as social conflicts than other types of life stressors (Sheets & Arney, 2020). Interpersonal stressors also heightened the risk for depression to a greater degree compared to other types of life stressors (Cohen et al., 2019). Although the relationship between depressive symptoms and social conflicts is well documented,

there has been limited research on the impact of social conflicts on the trajectory of symptom change for individuals with depression. It was hypothesized that the three gain groups would exhibit lower social conflict levels on average during treatment than non-gainers, and of the gain groups, unreversed sudden gainers would show lower social conflict levels than gradual gainers and reversed sudden gainers. Results did not support these hypotheses and did not show significant differences across the four groups. In addition, all groups demonstrated relatively low levels of social conflict on average during treatment, which were comparable to the levels of social conflicts among the general population (Boswell et al., 2015; Kraus et al., 2005). To the best of the writer's knowledge, there has been only one prior study examining the impact of life stressors on sudden gains for adult outpatients with depression (Hardy et al., 2005). Hardy and colleagues (2005) operationalized life stressors as the average number of stressful life events that occurred over the treatment period and did not find a significant association between sudden gains and the number of stressful life events. While the current result was also a null finding and replicated the prior finding, it is important to note several methodological differences. The present study focused on a specific type of stressors, social conflicts, instead of general life stressors. Social conflicts were also assessed such that the clients' scores represented the psychosocial impact of social conflicts rather than the presence or absence of such events/stressors. It is noteworthy that the null association between life stressors and sudden gains held across the two studies employing distinct operationalizations of life stressors. One consideration for future research is that if the timing of social conflicts had been examined more precisely (e.g., assessing social conflict levels preceding sudden gains rather than averaging social conflict levels across the treatment period), it could have provided a more fine-grained test of the association between social conflicts and sudden gains.

Several clinical implications can be considered in light of the current findings. First, monitoring the occurrence of sudden gains during treatment might be clinically useful in that clinicians can use the information to understand trajectories of clients' improvement over the course of treatment and to facilitate shared decision making regarding treatment duration. The present findings also suggest that what occurs after a sudden gain has an impact on their lasting effect on overall treatment outcome given that reversals appear to mitigate the beneficial effects of sudden gains. Clinicians can respond to rapid symptom improvements more thoughtfully and strategically, knowing that sudden gains typically contribute to a significant proportion of progress in treatment (Shalom & Aderka, 2020). Furthermore, given that sudden gains typically occur in the early phase of treatment (e.g., in the first half), identifying sudden gains could help justify shorter treatment duration. A meta-analysis of brief psychotherapy for depression demonstrated the efficacy of brief treatment protocols (six to eight sessions) for depression with small to medium effect sizes (Nieuwsma et al., 2012). However, the psychotherapy literature tends to emphasize the impact of different intervention methods on treatment outcome and may overlook the importance of trajectories of symptom change during treatment as a predictor of, and justification for, a shorter treatment. Relatedly, despite the robust body of literature on sudden gains (Shalom & Aderka, 2020), little is understood about what factors precede or contribute to sudden gains. Future research shedding light on what factors precipitate and sustain sudden gains would inform clinicians' decisions around how to facilitate and maintain rapid symptom remissions in clients and provide more efficient treatments.

The current study has several limitations. Given the nature of records review data, several treatment-related factors such as treatment modality, treatment duration, training and competencies across providers, and diagnosis of participants which are commonly controlled for

in randomized controlled trials were not controlled for in the present study. Nonetheless, the use of records review data is also a strength in that it provides high ecological validity. Records review data have been rarely used in prior studies on sudden gains, and even some of prior naturalistic studies still incorporated research protocols guiding treatment decisions (Aderka et al., 2011; Aderka et al., 2012; Adler et al., 2013; Clerkin et al., 2008; Doss et al., 2011; Hardy et al., 2005; Haugen et al., 2015; Stiles et al., 2003). Another limitation is that due to the lack of follow-up assessment, it remains unknown whether the effects of sudden gains were maintained over time. Therefore, longer-term effects of sudden gains could not be examined. It is also important to note that sudden gains and treatment outcomes were examined using the same depression measure. On the one hand, it is a common practice in the literature on sudden gains to use the same measure to operationalize sudden gains and to determine treatment outcomes (Shalom & Aderka, 2020). Nonetheless, to mitigate the threat of circular findings, the current study included gradual gainers as a comparison group and assessed treatment outcomes based on both depression and quality of life. At the same time, using separate measures to operationalize sudden gains and assess treatment outcomes would have provided a even more robust test of the sudden gains effects.

The present study is one of many to demonstrate that sudden gains are not merely short term fluctuations in symptoms, rather, they represent a stable change across the treatment period and predict overall treatment outcomes. What the current study contributes to the literature is expanding the limited research on sudden gains in naturalistic settings by employing records review data. The study also addressed the limitations of some of prior studies by examining gradual gainers as a comparison group to address the circularity critique raised in response to the sudden gains literature (Greenfield et al., 2011; Hedman et al., 2014). The fact that clients with

sudden gains had significantly greater improvements in depression symptoms by the end of treatment, even when compared to clients with gradual gains, demonstrates that rapid symptom reduction between two consecutive sessions provides unique benefits above and beyond the magnitude of change. While the significant impact of sudden gains did not generalize to the secondary measure of treatment outcomes based on quality of life, the current results provide insight into relationship between sudden gains and treatment outcomes. Levels of social conflicts during the treatment period were not associated with neither sudden gains nor gradual gains. Given the paucity of research, the impact of extra-therapeutic factors on the trajectory of symptom change during treatment remains marginally understood. The present findings suggest clinical utility of monitoring the occurrence of sudden gains to optimize treatment duration and the need for further investigation on the factors that promote and sustain sudden gains.

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Table 1

Demographic and Clinical Characteristics by Group

	Total (<i>N</i> = 233)	Unreversed Sudden Gainers (<i>n</i> = 39)	Reversed Sudden Gainers (<i>n</i> = 21)	Gradual Gainers (<i>n</i> = 73)	Non- Gainers (<i>n</i> = 100)	<i>p</i>	<i>ES</i>
Age – <i>M</i> (<i>SD</i>)	24.70 (8.50)	25.2 (9.7)	26.4 (6.2)	23.4 (7.1)	25.1 (9.3)	.434	.01
Sex – <i>n</i> (%)							
Female	130 (55.79)	21 (53.85)	14 (66.67)	45 (61.64)	50 (50.00)		
Male	99 (42.49)	18 (46.15)	6 (28.57)	27 (36.99)	48 (48.00)	.364	.12
Transgender	3 (1.29)	0 (0.00)	1 (4.76)	0 (0.00)	2 (2.00)		
Non binary	1 (0.43)	0 (0.00)	0 (0.00)	1 (1.37)	0 (0.00)		
Marital Status – <i>n</i> (%)							
Single	213 (91.42)	35 (89.74)	18 (85.71)	70 (95.89)	90 (90.00)	.336	.12
Married	18 (7.73)	4 (10.26)	2 (9.52)	3 (4.11)	9 (9.00)		
Divorced	2 (.86)	0 (0.00)	1 (4.76)	0 (0.00)	1 (1.00)		
Sexual Orientation – <i>n</i> (%)							
Heterosexual	160 (69.87)	25 (65.79)	16 (76.19)	49 (67.12)	70 (72.16)	.843	.10
Gay or lesbian	11 (4.80)	3 (7.89)	1 (4.76)	3 (4.11)	4 (4.12)		
Bisexual	45 (19.65)	7 (18.42)	3 (14.29)	17 (23.29)	18 (18.56)		
Not sure	12 (5.24)	2 (5.26)	1 (4.76)	4 (5.48)	5 (5.16)		
Employment Status – <i>n</i> (%)							
Employed full- time	35 (15.02)	7 (17.95)	4 (19.05)	10 (13.70)	14 (14.00)		
Employed part- time	43 (18.45)	6 (15.38)	3 (14.29)	16 (21.92)	18 (18.00)		
Retired	4 (1.72)	0 (0.00)	0 (0.00)	1 (1.37)	3 (3.00)		
Full-time student	117 (50.21)	20 (51.28)	11 (52.38)	37 (50.68)	49 (49.00)	.754	.14
Unemployed not looking for work	21 (9.01)	5 (12.82)	3 (14.29)	2 (2.74)	11 (11.00)		
Unemployed looking for work	12 (5.15)	1 (2.56)	0 (0.00)	6 (8.22)	5 (5.00)		
Working but not for money	1 (.43)	0 (0.00)	0 (0.00)	1 (1.37)	0 (.00)		
Income – <i>n</i> (%)							
None to \$10,000	14 (8.00)	3 (11.54)	1 (6.25)	6 (10.91)	4 (5.13)	.457	.21
\$10,000-\$20,000	8 (4.57)	0 (0.00)	1 (6.25)	4 (7.27)	3 (3.85)		
\$20,000-\$30,000	22 (12.57)	3 (11.54)	3 (18.75)	7 (12.73)	9 (11.54)		

\$30,000-\$40,000	15 (8.57)	3 (11.54)	0 (0.00)	4 (7.27)	8 (10.26)		
\$40,000-\$50,000	8 (4.57)	1 (3.85)	0 (0.00)	1 (1.82)	6 (7.69)		
\$50,000-\$75,000	27 (15.43)	6 (23.08)	4 (25.00)	6 (10.91)	11 (14.10)		
\$75,000-\$100,000	20 (11.43)	6 (23.08)	1 (6.25)	8 (14.55)	5 (6.41)		
\$100,000-\$200,000	48 (27.43)	4 (15.38)	5 (31.25)	16 (29.09)	23 (29.49)		
over \$200,000	13 (7.43)	0 (0.00)	1 (6.25)	3 (5.45)	9 (11.54)		
Ethnicity – <i>n</i> (%)							
Caucasian/White	169 (73.80)	27 (69.23)	16 (76.19)	49 (68.06)	77 (79.38)		
Hispanic	11 (4.80)	1 (2.56)	0 (0.00)	4 (5.56)	6 (6.19)		
Black/African-American	3 (1.31)	1 (2.56)	1 (4.76)	1 (1.39)	0 (0.00)	.324	.16
Asian	38 (16.59)	10 (25.64)	4 (19.05)	14 (19.44)	10 (10.31)		
East Indian	4 (1.75)	0 (0.00)	0 (0.00)	1 (1.39)	3 (3.09)		
Other	4 (1.75)	0 (0.00)	0 (0.00)	3 (4.17)	1 (1.03)		
Taking Psychiatric Medication - <i>M</i> (<i>SD</i>)	1.01 (1.27)	.95 (1.15)	1.29 (1.42)	.89 (1.11)	1.07 (1.38)	.58	.01
Number of Therapy Sessions – <i>M</i> (<i>SD</i>)	15.3 (10.0)	15.8 (12.7)	24.0 (9.7)	14.6 (10.1)	13.9 (7.8)	<.001	.08

Note. *M* = mean; *SD* = standard deviation; *ES* = effect size. Group differences were examined using Pearson's chi-square tests for categorical variables and analysis of variance (ANOVA) for continuous variables. Cramer's V and partial eta squared are reported as effect sizes for chi-square tests and ANOVAs, respectively.

Table 2

Means and Standard Deviations for Treatment Outcome Measures at Pre- and Post-Treatment by Group

	Unreversed Sudden Gainers (<i>n</i> = 39)	Reversed Sudden Gainers (<i>n</i> = 21)	Gradual Gainers (<i>n</i> = 73)
Pre-treatment Depression	3.15 (1.22)	2.97 (1.05)	3.09 (1.14)
Post-treatment Depression	0.26 (0.88) ^a	1.37 (1.28) ^b	1.55 (1.74) ^b
Pre-treatment Quality of Life	2.66 (0.10)	2.52 (0.81)	2.46 (1.03)
Post-treatment Quality of Life	1.75 (0.94)	2.01 (0.80)	1.96 (1.17)

Note. Different superscripts indicate significant pairwise differences after Bonferroni correction.

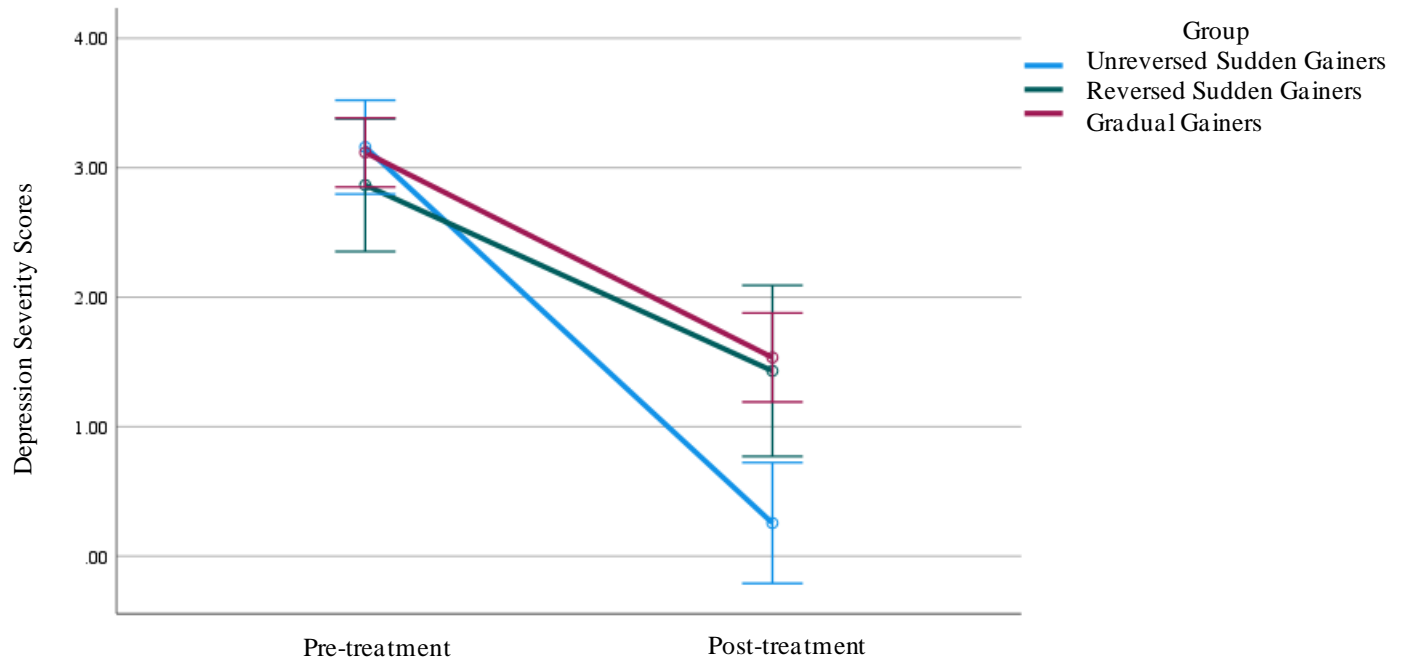
Table 3*Means and Standard Deviations for Social Conflict Levels During Treatment by Group*

	Unreversed Sudden Gainers (<i>n</i> = 39)	Reversed Sudden Gainers (<i>n</i> = 21)	Gradual Gainers (<i>n</i> = 73)	Non- Gainers (<i>n</i> = 100)	<i>p</i>	η_p^2
Social Conflict	0.10 (0.94)	0.11 (0.83)	0.32 (1.13)	0.09 (0.93)	.45	.01

Note. η_p^2 = partial eta squared.

Figure 1

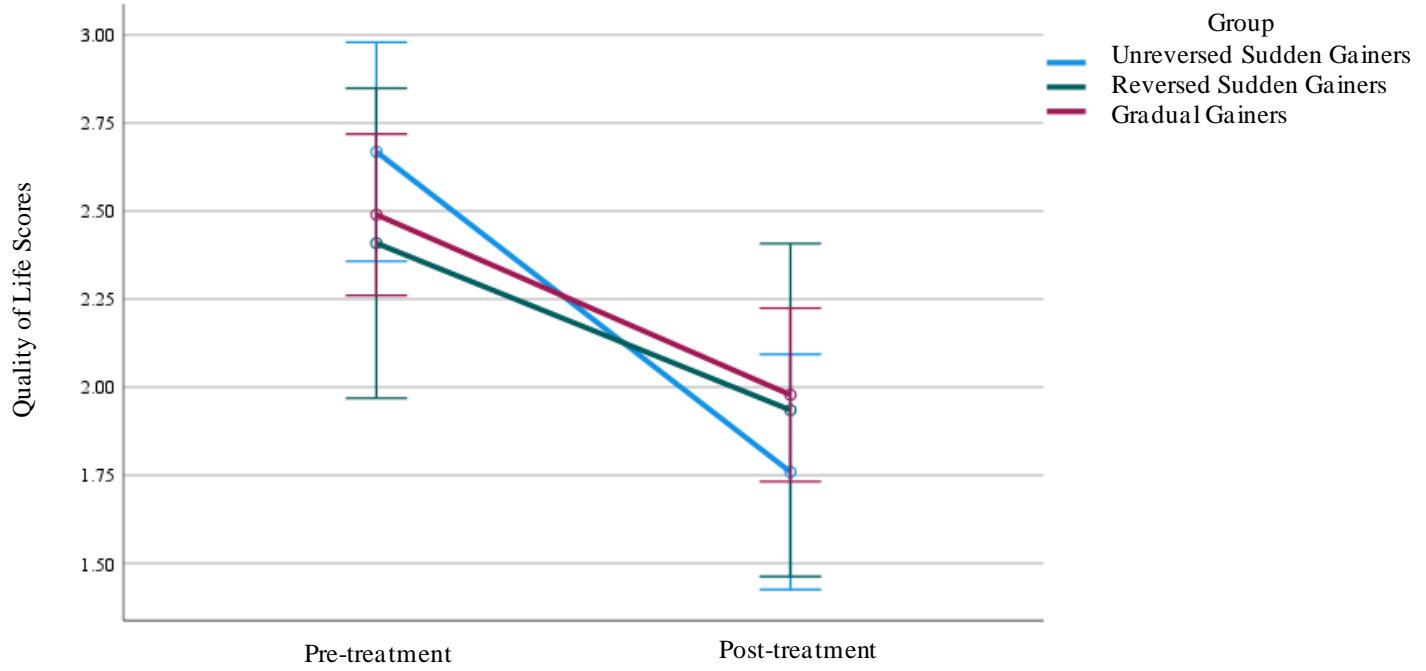
Interaction Between Time and Group on Depression Severity



Note. Error bars represent 95% confidence intervals.

Figure 2

Interaction Between Time and Group on Quality of Life



Note. Error bars represent 95% confidence intervals.

Appendix A

Treatment Outcome Package Clinical Scale Items

Clinical Scale	Item
Depression	Felt down or depressed
	Felt little or no interest in most things
	Felt guilty
	Felt restless
	Felt worthless
	Felt tired, slowed down, or had little energy
	Worried about things
	Had trouble concentrating or making decisions
	Noticed your thoughts racing ahead
Thought about killing yourself or wished you were dead	
Quality of Life	Been satisfied with your relationships with others
	Been satisfied with your daily responsibilities
	Been satisfied with your general mood and feelings
	Been satisfied with your life in general
Social Conflict	Felt too much conflict with someone
	Been emotionally hurt by someone
	Felt someone else had too much control over your life
	Felt sexually incompatible with your partner or frustrated by the lack of a partner
	Worried that someone might hurt you

Appendix A. Relevant clinical scale items from the Treatment Outcome Package (TOP). Items are rated on a 6-point Likert scale ranging from 1 (*All*) to 6 (*None*) in response to the prompt “Indicate how much of the time during the past two weeks you have ...”.

Appendix B

Informed Consent for Use of Clinical Records in Future Research Form



**Stony Brook
University**

Krasner Psychological Center

Department of Psychology
Stony Brook University
Stony Brook, NY 11794-2520
(613) 632-7830

RESEARCH-RELATED CONSENTS

Consent for use of clinical records in future research. Graduate students and faculty members sometimes wish to review clinical records of individuals who receive services at the KPC in order to help answer research questions. We are asking you to allow your (or your child's) KPC records to be made available for such research. Any information that identifies you in any way with the exception of a code will be removed before it is given to researchers.

You are not being asked to consent to any specific research study at this time. Anyone who wants access to your information must first have their research study reviewed and approved by Stony Brook University's Committee on Research Involving Human Subjects to ensure your rights and welfare are protected. If you have any questions about the use of your/your child's records for research purposes, contact Judy Matuk at (631) 632-9036 or judymatuk@stonybrook.edu.

Whether or not you allow your clinical records to be used for research, your services at the KPC will not be affected in any way. Additionally, you may withdraw your consent at any time by writing to Dr. Dina Vivian, Director of the KPC, at the address above or dina.vivian@stonybrook.edu

You will receive a copy of this form. You do not lose any of your legal rights by signing this form. If you have any questions about research, you may contact Dr. Dina Vivian at (631) 632-7848 or dina.vivian@stonybrook.edu. If you have any questions about your rights as a research subject you may contact Lu-Ann Kozłowski at (631) 632-9036, or Lu-Ann.Kozłowski@stonybrook.edu.

- I volunteer to allow my clinical records to be available future approved research.
- I do **not** want my clinical records to be available for future approved research.

Client's Name (Print)

Signature of Client (if 18 or older)

Parent or Guardian's Signature (if client is under 18)

Date