Sudden Gains and Sudden Losses in Cognitive Therapy for Major Depressive Disorder

DISSERTATION

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By

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Abstract

Previous research has shown that a substantial proportion of clients in cognitive therapy (CT) for depression make rapid symptom improvements in a single between-session interval; these “sudden gains” occur at different sessions across patients and provide an important window to examine factors that may be influencing clinical improvements. People who experienced sudden gains were more likely to be treatment responders, be at a lower risk of relapse, and demonstrate an increase in cognitive change in the session immediately preceding the sudden gain. These findings suggest that improvement in CT may be driven by changing patients’ thought processes, supporting the theory behind CT. The current study attempts to replicate previous findings with one important methodological difference: instead of expert cognitive therapists, we utilized therapists-in-training to help determine whether CT achieves effects through similar methods with inexpert therapists.

Forty-one depressed patients enrolled in a study to participate in 16 weeks of CT. Therapists were 4 advanced graduate students with two to three years of clinical experience. Ten independent raters were trained to assess cognitive change and rated sessions surrounding sudden gains. Twenty-four patients reported sudden gains with a mean magnitude of 11.2 BDI points, which represented 52% of the overall symptom improvement from pre- to post-treatment (21.2 BDI points). Results showed (a) no
difference in post-treatment outcome between patients who experienced a sudden gain and those who did not, (b) sudden gains did not reduce the risk for relapse, (c) cognitive change was found to be higher in the control (pre-pre-gain sessions) than the pre- or post-gain sessions. While the percentage and magnitude of sudden gains in this study were similar to previous research, these findings failed to replicate previous research that suggested people who experience sudden gains in CT for depression are more likely to be treatment responders and less likely to relapse. We also found a pattern of cognitive change contrary to expectations in that it was greatest two sessions before sudden gains. Our findings suggest that the factors influencing sudden gains in CT provided by therapists-in-training may be different than those previously reported among expert therapists. Perhaps novice therapists’ delivery of CT was such that cognitive change was not the primary determinant of sudden gains. Nonetheless, the clinical outcomes obtained compare favorably with those reported in previous clinical trials of CT. Further research needs to be done in order to help explain these findings.
Dedicated…

…to my parents, as always, for their unwavering support throughout the years

…to my husband, for taking a chance…and being patient
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<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vi</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>viii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xiii</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Sudden Gains</td>
<td>3</td>
</tr>
<tr>
<td>Sudden Gains Terminology</td>
<td>5</td>
</tr>
<tr>
<td>Sudden Gains in CT</td>
<td>5</td>
</tr>
<tr>
<td>A Failure to Replicate?</td>
<td>8</td>
</tr>
<tr>
<td>Sudden Gains in Other Treatments</td>
<td>9</td>
</tr>
<tr>
<td>The Role of Therapist Expertise</td>
<td>13</td>
</tr>
<tr>
<td>Sudden Losses</td>
<td>19</td>
</tr>
</tbody>
</table>
List of Tables

Table 1. Demographic Information

Table 2. Reversal Rates from Previous Sudden Gains Research in Treatments of Major Depressive Disorders

Table 3. Means (and Standard Deviations) for Process Variables by Session Type

Table 4. Adherence factors changing as a function of session type.
List of Figures

Figure 1. Temporal sequence of sudden gains. ................................................................. 74

Figure 2. Study enrollment for the current sample.......................................................... 75

Figure 3. Repeated measures ANOVA looking at the difference in Cognitive Change scores by session type .................................................................................................................. 76

Figure 4. Repeated measures ANOVA looking at the interaction of Axis II diagnosis with Cognitive Change scores by session type ........................................................................ 77

Figure 5. Repeated measures ANOVA looking at the interaction of sex with alliance scores by session type ........................................................................................................... 78

Figure 6. Repeated measures ANOVA looking at the difference in adherence variables by session type ................................................................................................................... 79
Chapter 1: Introduction

Cognitive therapy (CT) has repeatedly been shown to be an efficacious treatment for Major Depressive Disorder (MDD; for a review, see Strunk & DeRubeis, 2001). However, the exact mechanisms by which CT achieves its effects are not yet well understood. Identifying the mechanisms of change in CT has proven difficult in part because treatment occurs over an extended period and investigators are unsure when mechanisms are at work (Strunk & Brotman, 2003). It is also likely that critical changes occur at different times for different patients. Consistent with this possibility, Tang and DeRubeis (1999) have shown that a substantial proportion of clients make sudden, rapid symptom improvements in a single between-session interval. These “sudden gains” occur at different sessions across patients, but appear to occur for about 40% of patients in CT for MDD (Tang & DeRubeis, 1999; Tang, DeRubeis, Beberman & Pham, 2005; Tang, DeRubeis, Hollon, Amsterdam & Shelton, 2007). According to this research, the symptom reduction in sudden gains in CT often represents 50% or more of the total symptom reduction throughout the course of treatment. In addition, the people who experienced these gains were more likely to be considered treatment responders and be at lower risk for relapse following treatment.

Since then, multiple researchers have examined sudden gains both in CT and in other treatments. Results suggest that sudden gains do occur at similar rates across
treatments, but that these gains are likely triggered by different treatment-specific factors (e.g., Andrusyna, Luborsky, Pham & Tang, 2006). In CT, patients have been rated as experiencing cognitive change in sessions immediately preceding the sudden gain. Identifying and examining the antecedents of sudden gains provides an important window into possible mechanisms of change within a given treatment. In this paper, we attempt to extend the previous findings by identifying predictors of sudden gains in a sample of therapists-in-training providing CT. If a pattern of sudden gains with novice therapists parallel those that have been obtained with more expert therapists, then these results would be consistent with the notion that cognitive change may be an important determinant of symptom change – even among less expert therapists. In this way, we also hope to increase the overall understanding of how CT is able to effectively improve clients’ levels of depression.

While it is imperative to understand how people make progress in therapy, it is also important to investigate not only why some people do not improve, but why some people may report an increase of symptoms while in therapy. In fact, some researchers believe that occasional symptom worsening is a valuable part of the treatment process, as it may be a product of healthy processing of emotions and could provide an opportunity to model adaptive coping strategies (e.g., Hayes & Strauss, 1998). Therefore, we will also look at “sudden losses,” or abrupt symptom deterioration between sessions, to consider their relevance to the course of treatment. There is little research that has attempted to examine predictors of such losses or identify whether certain therapist behaviors after a loss can help patients to recover from the setback and still achieve a positive therapeutic
outcome. Thus, we will attempt to identify potential predictors of sudden losses and whether the manner of therapist response to these losses can affect the subsequent course of treatment.

Sudden Gains

Sudden gains research is based on the general observation that change is not always linear and aggregated data may not be able to capture important individual differences in the course of symptom improvement. In the study that introduced the concept of sudden gains, Tang and DeRubeis (1999) found that approximately 40% of CT patients with MDD in two different trials (Elkin, Shea, Watkins, et al., 1989; Hollon, DeRubeis, Evans, et al., 1992) experienced abrupt, dramatic drops in symptom severity in one between-session interval. Moreover, this sudden improvement in symptoms represented over half of the overall individual symptom change and these patients were more likely to be considered treatment responders. These gains also seemed to be long-lasting, as patients were likely to maintain their response status 18 months after treatment (Tang & DeRubeis, 1999) and had lower relapse rates than patients who did not experience a sudden gain during a 24-month follow-up period (Tang, DeRubeis, Hollon, et al., 2007). Thus, these “sudden gains” appear to be associated with a sudden, yet enduring, improvement in depressive symptoms and offer researchers a way of identifying when mechanisms may be most active in CT.

Rating data offers a unique and detailed method to look at the potential role of CT specific factors in influencing a sudden gain. The intention of CT for depression is to alter depressogenic schemas and the supposition is that the process to achieve these
modifications is to alter negative, inaccurate thinking patterns (Beck, Shaw, Rush & Emery, 1979). While there is considerable evidence that CT is efficacious in treating depression, there is a lack of direct evidence supporting the assumptions that cognitive mediation is the primary process responsible for therapeutic improvement. Multiple studies have suggested a relationship between CT and changes in a variety of cognitive variables across a number of domains. However, what is generally lacking is evidence that these cognitive changes precede the symptom improvements they purportedly cause. For example, change in hopelessness – as assessed by the Hopelessness Scale (HS; Beck & Steer, 1988) – within the first four weeks of CT predicted improvement in post-treatment depression scores (Kuyken, 2004); cognitive change – as measured by the Attributional Style Questionnaire (ASQ; Seligman, Abramson, Semmel, & von Baeyer, 1979), Dysfunctional Attitude Scale (DAS; Weissman, 1979), and HS – mediated successful outcomes in CT (DeRubeis, Evans, Hollon, Garvey, Grove & Tuason, 1990); and changes in negative cognitive content – as assessed with the ASQ, DAS, and Self-Efficacy scale (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs & Rogers, 1982) – differentiated treatment responders from non-responders (Jarrett, Vittengl, Doyle & Clark, 2007). Thus CT does appear to be associated with positive changes in cognition. There has been difficulty, however, finding when in a course of CT (if at any one point) one could identify cognitive changes as having occurred and then still find substantial symptom change after this point.

Sudden gains research introduces a different way to study the change process in CT by looking at potential factors of influence from different time periods for different
patients—at least those patients who experience sudden gains. By identifying time points of significant symptom improvement, a moment of change can be capitalized on by analyzing the sessions surrounding the change. In this way, it may be possible to indicate specific factors driving the improvements. Determinants of symptom change may be identified through this more individualized approach, whereas these factors may have been more difficult to detect using aggregated data involving the assessment of predictors at the same time point for all patients.

_Sudden Gains Terminology_

According to Tang and DeRubeis (1999), a sudden gain is measured as a sudden drop in a client’s Beck Depression Inventory (BDI; Beck, Steer & Brown, 1996) – as measured at the beginning of each session – between consecutive therapy sessions. The therapy session preceding the gain is referred to as the pre-gain session (or session N) and the session immediately after the gain as the post-gain session (or session N+1). A control session is also included as a comparison point, and is typically the session before the pre-gain session (or session N-1). Therefore, the typical temporal sequence is as follows: control (N-1) → pre-gain (N) → (sudden gain) → post-gain (N+1). See Figure 1 for a graphical representation of a sudden gain and the sessions of interest surrounding that gain.

_Sudden Gains in CT_

As mentioned above, the sudden gains phenomenon was introduced by Tang and DeRubeis (1999), who found that a sizeable percentage of the CT patients (39%, 24 of 61) experienced a sudden gain and that those sudden gains accounted for 51% of their
total symptom reduction (mean magnitude of all sudden gains = 11.2 BDI points). The positive effects of sudden gains seemed to extend beyond post-treatment – where 79% of sudden gainers were treatment responders as compared to 41% of non-sudden gainers – as they maintained their gains at 6-month and 18-month follow-up assessments (although this difference was not significant at the 12-month assessment point). To explain these findings, Tang and DeRubeis rated the therapy sessions surrounding the sudden gain – the pre- and post-gain sessions, as well as a control session – and found that significantly more cognitive change (as assessed by a scale created for this purpose, which highlighted instances of progress made in adopting cognitive techniques and reappraisal) occurred in the pre-gain session as opposed to the control session. This suggests that during the session directly before the sudden gain, patients were rated as having achieved an insight into their cognitive errors or accepted that a change in their way of thinking was a key to recovering from their depressive episode. These insights appeared to be maintained and applied in further instances, as the level of cognitive change in the post-gain session was equal to the cognitive change found in the pre-gain session (and significantly greater than the control session). The authors propose that the insight attained within the pre-gain sessions sets the course for more cognitive change, and therefore the achievement of better outcomes.

As the goal of CT for MDD is to identify, examine, and ultimately change patients’ inaccurate negative thinking patterns (Beck, Shaw, Rush & Emery, 79), sudden gains might represent the consequences of successful implementation of CT techniques. Tang and DeRubeis, however, failed to identify therapist adherence to CT techniques as a
predictor of sudden gains. They also failed to find a relation between the therapeutic alliance and a subsequent sudden gain; however, their data do suggest that sudden gains predict a better subsequent alliance, as the alliance in post-gain sessions was significantly higher than in pre-gain and control sessions. These findings suggest the possibility that as symptoms are reduced, clients form better working relationships with their therapists. This notion is consistent with research on the role of the alliance in CT (e.g., Feeley, DeRubeis, & Gelfand, 1990; Strunk, Brotman & DeRubeis, 2010), which suggests that a high-quality alliance may be an outcome rather than a cause of therapeutic gains. Tang and DeRubeis propose that the combination of symptom improvement and increased alliance propels into an “upward spiral” of positive change after a sudden gain is achieved, often resulting in a positive outcome.

Tang, DeRubeis, Beberman and Pham (2005) replicated these findings in a more recent study utilizing two conditions of a component analysis study of CT investigated by Jacobson and colleagues (1996): automatic thought (AT), which included both automatic thought and behavioral activation interventions, and CT, which included all of the components of traditional CT with an emphasis on modifying core depressogenic schemas. Both treatment variations experienced sudden gains at similar rates (AT 46% vs. CT 43%) and the magnitude of change on the BDI (AT 11.5 vs. CT 10.2) per sudden gain was also comparable. Again, sudden gains predicted lower BDI scores at the end of treatment and more cognitive change occurred in the sessions directly preceding sudden gains than the control sessions. These findings lend support for the important role of cognitive mediation not only in sudden gains, but also in overall treatment success.
Tang, DeRubeis, Hollon, Amsterdam and Shelton (2007) also extended the findings that sudden gains predicted lower BDI scores beyond treatment completion. In a sample of 60 CT clinical trial patients, 24 (40%) experienced a sudden gain during treatment, with an average magnitude of a sudden gain of 11 points on the BDI. At the end of treatment, sudden gains patients had significantly lower mean scores on the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960) than non-sudden gains patients (7.8 vs. 14, respectively), and were almost twice as likely to meet response criteria (79% vs. 44%). Only one-third of responders who had experienced sudden gains relapsed in two years as compared to nearly three-quarters of responders who had not experienced sudden gains during treatment. These data suggest that sudden gains are not merely a random variation in symptoms, but could represent an important moment of insight that can have a long-lasting positive impact on recovery from MDD.

A Failure to Replicate?

There is one major exception to the findings supporting the importance of sudden gains within CT specifically. Vittengl, Clark, and Jarrett (2005) found that all three of the treatment groups in their sample – CT, antidepressants, and placebo plus clinical management – experienced sudden gains without differences in proportion or magnitude across treatments. Out of 227 patients, 42% had sudden gains and were significantly more likely to meet response criteria at the post-treatment assessment than those without sudden gains (76% vs. 49%, respectively). At the 8-month follow-up, however, there was no significant difference in relapse rates between sudden gains and non-sudden gains patients. Thus, these authors concluded that sudden gains had high short-term predictive
validity, but were not a useful predictor of long-term outcome. They also stated that, since there was no distinction between treatment modalities, sudden gains must be due to nonspecific factors (e.g., therapeutic alliance) and not because of treatment-specific factors, such as cognitive change as Tang and DeRubeis proposed.

These findings, however, are considerably limited by the method utilized when calculating sudden gains in this study. So far, the reviewed literature has included very similar measures and definitions of what constitutes a sudden gain: a change in depression score of a similar magnitude when depressive symptom severity is measured at each session. Vittengl, Clark, and Jarrett made an important, and perhaps consequential, adjustment to their method of measurement – instead of measuring the patients’ symptoms at every session, they measured it at every other session. This modification allows for the possibility that large between-session drops are missed or that large drops which were identified were actually a more gradual decline over two sessions. To highlight the considerable discrepancies that can occur because of this methodological modification, Tang and colleagues (2007) reran the analyses from their 1999 dataset employing the criteria used by Vittengl, Clark, and Jarrett and found that their previously significant findings were nullified. Therefore, the conclusion of Vittengl, Clark, and Jarrett that sudden gains lack a long-term predictive relation to outcome appears to be limited to sudden gains as operationalized in their study.

**Sudden Gains in Other Treatments**

Since the introduction of the “sudden gains” concept, multiple researchers have examined whether sudden gains are as common an occurrence in other treatment
modalities as they seem to be in CT. Studies show that sudden gains are not unique to CT, as they have been found in a number of psychotherapies for depression: supportive-expressive therapy (Tang, Luborsky & Andrusyna, 2002), behavioral activation treatment (Andrusyna, 2007), interpersonal therapy (Kelly, Cyranowsk, & Frank, 2007), CT-based group therapy (Kelly, Roberts & Ciesla, 2005), and family therapy (Gaynor, Weersing, Koko, et al., 2003). On average, these studies identified similar rates and magnitudes of sudden gains to those found in studies of CT. However, the data are inconsistent with regard to whether or not sudden gains were associated with superior outcomes. In supportive-expressive therapy (Tang, Luborsky & Andrusyna, 2002), behavioral activation (Andrusyna, 2007), and family therapy (Gaynor, Weersing, Koko, et al., 2003), sudden gains have been related to favorable outcomes; however, sudden gains were not related to outcome in interpersonal therapy (Kelly, Cyranowsk, & Frank, 2007) or CT-based group therapy (Kelly, Roberts & Ciesla, 2005).

It is the stability of the gains, however, that is most suggestive of a potentially important difference in sudden gains between treatment modalities. The percent of patients who experienced a reversal of sudden gains – defined as losing 50% or more of the symptom improvements captured in a sudden gain – was on average higher in the other treatment modalities (46% in supportive-expressive therapy, Tang, Luborsky & Andrusyna, 2002; 35% in behavioral activation treatment Andrusyna, 2007; 53% interpersonal therapy, Kelly, Cyranowsk, & Frank, 2007; 54% in CT-based group therapy, Kelly, Roberts & Ciesla, 2005; and 25% in family therapy, Gaynor, Weersing, Koko, et al., 2003) than the number found in the CT samples (17% in Tang & DeRubeis,
1999; 32% and 40% in Tang, et al., 2005; 34% in Tang, et al., 2007). This suggests that, while the patterns of sudden gain occurrence are similar between CT and other treatment modalities, the gains achieved in the other therapies may be less stable.

Thus, while sudden gains occur in other treatments at similar rates as CT, there may be differences in the extent that these gains endure over time. It is possible that these differences exist because the mechanism by which the gains are achieved differs between treatment modalities. In fact, while not central to our purpose, sudden gains examined in other treatments have provided evidence that the mechanisms hypothesized in those treatments support gains. For example, interpretation accuracy was found to be an important predictor of sudden gains in supportive expressive therapy, as it was significantly different between pre-gain and control sessions (Andrusyna, Luborsky, Pham & Tang, 2006). This finding is consistent with the supportive expressive therapy rationale, which suggests that accurately interpreting interpersonal themes helps patients increase their self-understanding and adaptive interpersonal responses, and thereby leads to symptom improvement. Similarly, there is evidence that sudden gains in BA are specific to mechanisms hypothesized to be important in behavioral activation (Andrusyna, 2007), as it was found that both agreement to changing behaviors and engaging in positive activities were significantly higher in pre-gain sessions than control sessions. Neither of these studies found within-session cognitive change to be associated with sudden gains. Therefore, while the mechanisms of sudden gains may be different between supportive expressive therapy, behavioral activation treatment, and CT, it appears that sudden gains are achieved by a means consistent with each theory supporting
the treatment delivered. This suggests that there are multiple pathways to sudden gains and that these gains, in part, might be explained by treatment specific factors. The commonality of sudden gains between modalities may be the degree to which clients are invested in the type of treatment offered, represented by such factors as the level of involvement in therapy, responsiveness to the therapist’s treatment specific line of questioning, and the commitment to the treatment that they are in. Therefore it is important to undertake research within various psychotherapies to better understand the mechanisms underlying different treatment modalities.

In sum, these findings suggest that sudden gains in CT are associated with greater change and represent more than transient symptom variability, as they predict enduring effects of CT. Perhaps more importantly, sudden gains provide researchers with a window of opportunity to look at what may drive these positive, continuing changes. According to Tang and colleagues, cognitive change may be the mechanism driving the changes in sudden gains achieved within CT; these changes may then be followed by a positive upward spiral of increased alliance and continual symptom improvement. However, each of the studies reviewed utilized therapists who had considerable experience with CT and benefited from the monitoring and supervision provided in clinical trials. As people move to disseminate CT for MDD, there is a need to understand the extent to which these mechanisms are operating within CT when delivered by less experienced therapists in a naturalistic setting.
Variability in therapist skill may also play a role in determining the manner in which CT works. It is possible that more experienced and skilled therapists are better able to challenge and subsequently change deeper depressogenic schemas, whereas less expert therapists may focus on more surface cognitions that only target acute symptoms (Garratt, Ingram, Rand & Sawalani, 2007). If this is true, it might be the case that CT does in fact work according to the processes proposed by the CT model, but only with expert therapists who are more adept with cognitive methods. If, however, comparable results can be obtained with inexpert therapists, then it suggests CT may achieve its effects according to the model regardless of therapists’ level of experience.

The majority of the research on sudden gains with CT for MDD has been in clinical trials, where the highest priority has been to determine whether or not a treatment is efficacious in optimal conditions. In these cases, the administration of CT was conducted by expert therapists and the therapists’ performances were typically monitored, therefore it could be assured that CT was delivered according to the manual. However, the expectation that CT will always be delivered by experts in the field is not realistic, especially when there is increasing interest in disseminating empirically supported treatments to general practitioners, without the requirement of expert training. Therefore it is crucial that we understand how treatment mechanisms may work in naturalistic settings, as the emphasis should be on increasing external validity.

One major question in CT is whether expertise is necessary to deliver treatment effectively. There is surprisingly little research into the role of therapist experience in CT,
but three recent studies found a significant positive association between competence and outcome (Kuyken & Tsivrikos, 2009; Strunk, Brotman, DeRubeis, & Hollon, 2010; Trepka, Rees, Shapiro, Hardy, & Barkham, 2004). In a clinical trial of CT with MDD patients, Strunk, Brotman, DeRubeis and Hollon (2010) found that competence ratings predicted session-to-session symptom change early in treatment (within the first four sessions), and predicted symptom change between session 4 and the end of 16 weeks of treatment. In two studies of CT in routine care, ratings of therapist competence significantly predicted post-treatment BDI scores (Kuyken & Tsivrikos, 2009; Trepka, Rees, Shapiro, Hardy, & Barkham, 2004). Superior outcomes were also found at treatment sites that had more experienced therapists in several of the larger efficacy studies of CT for MDD (e.g., DeRubeis, Hollon, Amsterdam, Shelton, Young, et al., 2005; Jacobson & Hollon, 1996). While not all research supports a positive association between competence and outcome (for a review, see Webb, DeRubeis & Barber, 2010), there is some evidence to suggest that therapist expertise may be a determinant of outcome in CT. Consequently, the quality of CT training and supervision is of major concern.

Marked variation has been found in both training and supervision of empirically supported treatments when brought into routine care (Elkin, 1999). High levels of training, consistent monitoring, and quality supervision in clinical trials assures a level of expertise, competence, and adherence to the treatment manual. This degree of investment, however, is likely not followed in routine practice of these interventions. Implementing treatment protocols involves more than following a treatment manual;
dedicated therapists and supervisors are needed to provide the high-quality therapy intended by those who compiled the guidelines. There is a paucity of direct evidence for the benefits of training and supervision when disseminating empirically supported treatments, but studies have linked supervision to improved skill level (Milne, Pilkington, Gracie & James, 2003) and to enhanced adherence, and in turn to better outcomes, when transporting therapies into routine care (Simons, Padesky, Montemarano, Lewis, Murakami, Lamb, et al., 2010; Schoenwald, Sheidow, & Chapman, 2009).

Some differences in levels of competency can be accounted for by a lack of high-quality training and limited experience. It is also possible that novice CT therapists are more prone to “therapist drift” (Waller, 2009), or giving in to “safety behaviors” (e.g., supportive encouragement, active listening) that make the client feel better in the moment while foregoing some of the more rigorous CT activities that are likely to be beneficial in the long run. Novice CT therapists may be more comfortable providing a general supportive therapeutic environment as opposed to actively pursuing cognitive or behavioral techniques that may be difficult or challenging for the patients, thus watering down the effectiveness of CT.

While the research on expertise in CT for MDD is limited, it does suggest that there is an outcome advantage for more experienced, competent CT therapists (Kuyken & Tsivrikos, 2009; Strunk, Brotman, DeRubeis, & Hollon, 2010; Trepka, Rees, Shapiro, Hardy, & Barkham, 2004). There is, however, evidence that suggests that CT is effective in naturalistic studies (e.g., Kuyken, Kurzer, DeRubeis, Beck, & Brown, 2001; Persons, Burns & Perloff, 1988). This raises the question that, if novice therapists are not
providing the high-quality treatment as intended by the manual developers, is the mechanism of change in CT different based on the experience of the therapist? One way that this question may be answered, in part, is by studying a snapshot of treatment in which the client experiences a sudden gain in CT delivered by inexpert therapists. Ideally, these studies should involve a more controlled atmosphere, marked by solid training, supervision, and consistent monitoring of treatment. In this way, results can be directly compared to well-controlled clinical trials with expert therapists. This makes it possible to support claims that sudden gains in CT are driven by the clients' understanding and application of the CT model (as assessed by cognitive change), and whether these types of gains can also be achieved with inexpert therapists.

Some research has begun to look into sudden gains in routine care, but each study had limitations that may make them inappropriate as direct comparisons to clinical trials. Hardy and colleagues (2005), for example, studied sudden gains in CT for MDD in a community care setting. The therapists ranged in years of general clinical experience, but all were trained specifically in CT for the purposes of the study and received weekly supervision. Thus, while these therapists had up to six years of postgraduate clinical experience, they were relative novices to delivering CT. Within their sample, however, they found a similar percentage of sudden gains (41%) with a similar magnitude of change (13.3 BDI points) to those reported in CT for MDD in more expert samples. These gains also represented more than half of the overall symptoms change and were significantly associated with outcome. However, the length of treatment that each client
received was variable – between eight and twenty sessions – therefore it is more difficult to compare the results to a controlled trial with consistent treatment length.

In another example of sudden gains in routine care, Tschitsaz-Stucki and Lutz (2009) identified sudden gains in 26% of their patients, but unlike in previous studies, the authors did not find that sudden gains patients reported better treatment outcomes. They also did not find clear support for cognitive change as the primary mechanism of change in these gains, although sudden gains patients did experience more frequent and intense cognitive changes in the context of labeling and discussing daily hassles (as opposed to deeper core beliefs), specifically. In fact, they found that if daily hassles were discussed without cognitive processing, then patients reported more within session negative feelings and a worse session outcome was predicted. The treatment in this study was not specifically CT, but instead was derived from a variety of treatment orientations in a training clinic with advanced clinical psychology students. Thus, there seems to be two possible explanations for the differences in results (i.e., the association of sudden gains to outcome and the occurrence of cognitive change). One, the differences in treatment approaches make direct comparisons difficult; if the therapists were not presenting clients with the CT model, then changing cognitions may not be a focus of treatment and therefore would not be expected to drive symptom change. Two, the therapists in the current study were not experts in delivering effective treatment; if the therapists did attempt to guide cognitive change, perhaps they were not skilled enough to do so in an effective manner.
In another study looking at a variety of treatments used in routine care, Stiles and colleagues (2003) found that 17% of patients experienced a sudden gain and that these patients had significantly better outcomes than the patients who did not experience a sudden gain. Nearly half of these patients, however, experienced a reversal of their gains. Thus, it appears that sudden gains occur in routine settings – albeit less frequently and with less stability – but it is difficult to interpret these findings due to the variety of treatments included and the diagnostically heterogeneous sample. It was noted that “many of the therapists were familiar with published treatment manuals (pp. 15),” but only two of the 33 therapists in the study had specialized training in CT. Given that information, it can be safely assumed that the therapists in these routine clinic settings were not experts in CT and, perhaps more importantly, the therapists were not consistently following a formal manualized protocol, introducing a lot of variability in terms of treatment approaches, focus (e.g., insight oriented versus symptom centered), and duration. On the one hand, it is possible that these findings of sudden gains in routine care are evidence for the nonspecific factors contributing to sudden gains. On the other hand, it is possible that the large differences in incidence and stability are due to the use of different strategies, diversity of diagnoses treated, and lack of specific empirically supported therapeutic techniques in the routine care sample.

In sum, sudden gains do appear to be a part of routine care but, as they seem to be less frequent and less stable, it is possible that the these gains were not preceded by an insight or skill achieved in the previous therapy session, such as the association between cognitive change and sudden gains in CT. It is also a possibility that the lack of stability
of the sudden gains found in routine care may, in part, be due to the lower levels of therapist competence in the delivery of treatment. However, there is a need for a more controlled research environment (e.g., quality supervision to ensure the competent delivery of CT, a diagnostically homogenous sample, similar training experiences among therapists) to better understand the occurrence of sudden gains when treatment is delivered by inexpert therapists. It is difficult, if not impossible, to glean meaningful information when attempting to draw comparisons between studies of varying treatment types, patient diagnoses, and treatment lengths, especially when the goal is to understand the mechanism of sudden gains.

**Sudden Losses**

Sudden gains research capitalizes on the notion that individual variability in treatment progress is important. Perhaps as important as identifying treatment gains, however, is understanding the losses that often occur over any given course of psychosocial treatment. On average, psychotherapy is found to be consistently helpful (for a review, see Cuijpers, van Straten, Andersson, & van Oppen, 2008); researchers have focused less on (presumably rare) occasions when psychotherapy may lead to clinically significant worsening of symptoms. There has been some research into predictors of patients who do not respond to treatment, such as low motivation (Mohr, Beutler, Engle, Shoham-Salomon, Bergan, Kaszniak, & Yost, 1990) or lack of productive involvement (Sachs, 1983), but there has been little research into what may drive increases in symptoms over the course of therapy. There is evidence to suggest that people who are more emotionally reactive, such as those high in cluster C personality
traits, are more likely to experience an erratic pattern of symptom change across
treatment and subsequently have a poorer outcome in CT for depression (e.g., Fournier,
DeRubeis, Shelton, Gallop, Amsterdam & Hollon, 2008).

Other researchers have argued that a period of destabilization – defined as a high
level of turbulence in depressive symptoms measured by independent raters – in CT
represents a transition point and may be necessary to achieve change (e.g., Hayes &
Strauss, 1998). These investigators believe that in order to activate and process the
cognitive and affective components of the depressogenic schema, one must fully
experience thoughts and emotions that they have been avoiding, which will likely cause
an increase in symptoms of depression and anxiety, before they are able to experience
improvements.

In support of the idea that occasional symptom worsening can be a natural and
potentially beneficial part of therapy, a study on exposure-based CT for depression
(Hayes, Feldman, Beevers, Laurenceau, Cardaciotto, & Lewis-Smith, 2007) found that
62% of the sample experienced at least one spike (sudden, noticeable increase) in
depressive symptoms and this transient exacerbation was related to better outcome at the
end of treatment. Moreover, those who experienced these spikes in depression symptoms
demonstrated high levels of cognitive-emotional processing during these periods, defined
as exploring issues of depression and experiencing a shift in perspective or insight. This
cognitive-emotional processing factor may be broader than cognitive change as defined
by Tang and DeRubeis (1999) in the sudden gains literature, as it also encompasses
emotional processing, but the findings do suggest that there is an active cognitive
component at work during these times of temporary symptom deterioration, which is then predictive of a positive outcome. Therefore there is reason to believe that patients who experience sudden losses are also capable of benefiting from changes in cognition. These findings must be interpreted with caution, however, as the treatment was a modified version of CT, specifically designed to have an exposure-based component intended to increase negative symptoms in order for clients’ to learn how to process and tolerate them. In CT, the degree to which patients explore the cognitive aspect of their depressive symptoms is in large part dictated by the therapist. Thus, it might be possible to capture cognitive change during the session after the decline is reported (as opposed to in the session before with sudden gains), but it would depend on whether the therapist chooses to pursue cognitive strategies. In this way, therapists’ behaviors may help a patient recover from a loss and progress towards a positive treatment outcome, potentially via cognitive change.

In another study that corroborates the notion that symptom deterioration between sessions may not necessarily denote a poor treatment outcome, Thompson, Thompson and Gallagher-Thompson (1995) examined the individual patterns of change for each recovered MDD client (treated with either CT, behavioral therapy, or brief psychodynamic psychotherapy) over time and found that, not only did 90% of the clients experience a sizeable worsening in BDI at one point between sessions, but that on average people had more than two significant declines over the course of treatment. Therefore there is evidence that many clients who experience sudden symptom increases throughout treatment still end up with positive outcomes, and generally these drops are
not captured because the aggregate of symptom scores resulted in a steady linear decline. When looking at each data point, however, it becomes clear that clients often do not have a steady decline in symptoms from pre- to post-treatment, but instead experience various peaks and valleys along their symptom trajectory throughout treatment. This suggests the possibility that experiencing a brief set-back may actually be beneficial for clients in order to have the experience of successfully working through it in treatment and learning how to utilize and apply cognitive and behavioral strategies. However, there is very little research on what happens immediately preceding or following these large between session increases in symptoms – termed “sudden losses” – which may be helpful to inform therapists how to either avoid a set-back or productively utilize one to model coping strategies.

One possible factor driving sudden losses could be an acute difficulty in the alliance between the client and the therapist. Problems in the therapeutic relationship are common in treatment, and some have argued that it is beneficial to experience them because a successful resolution can be modeled. Nagy, Safran, Muran and Winston (1998; in Safran, Muran, Samstag & Stevens, 2001), for example, reported that patients described problems in the therapeutic alliance in 11 to 38% of sessions, whereas therapists reported ruptures in 25 to 53% of sessions. These high numbers suggest that not only are rifts likely, but also that the perception and definition of these rifts vary a great deal between therapists and clients. In extreme cases, a rupture might be irreparable and lead to a premature termination of treatment; in many cases, however, it can be a catalyst for important therapeutic change, including the modeling of an effective and
constructive method to resolving problems and altering inaccurate negative beliefs about relationships (Safran, 1993). These findings are in line with the idea that experiencing both increases and decreases in symptoms during treatment can actually a positive step towards improvement.

A German research group has also extended the research on sudden gains to look at sudden losses. Tschitsaz and Lutz (2009) identified both sudden gains and sudden losses in their sample of female patients seeking eclectic psychotherapy treatment options for depression and/or anxiety. In addition to the 29% of patients who experienced sudden gains only, there were 20% who experienced only sudden losses and 26% who experienced both a sudden gain and a sudden loss. Contrary to expectations that rapid between-session symptom deterioration may be explained by a negative life event outside of therapy (e.g., interpersonal difficulties, job stress), the sudden loss clients did not report more negative life events or daily hassles than those in the sudden gain group. However, a weaker therapeutic relationship – defined here as therapists who were critical, impatient, controlling and distanced – was found to be correlated with sudden losses. It was also noted that the utilization of directive and behavioral exercises in the post-loss meetings (especially for those in the who experienced both a gain and a loss) were associated with concurrent positive emotions, while the use of emotion supporting interventions were associated with negative emotions in session. This suggests the possibility that focusing on CT behavioral techniques such as problem solving, role-playing, or exploring alternative behaviors could be more beneficial than focusing on the emotional reaction for a client who has recently experienced an increase in depressive
symptoms. Again, there are limitations to drawing conclusions based on these findings, as the treatment orientations were varied and the sample was comprised of all women with a variety of diagnoses.

While not much is known about the occasional symptom worsening across the course of treatment, it is a potentially fruitful area for research. It is possible that, by understanding what occurs in the sessions surrounding a sudden loss, we could identify predictors of recovery by identifying constructive ways for a therapist to respond in the wake of a loss. For example, it may be more advantageous to focus on cognitive and behavioral interventions as opposed to emotion-focused strategies after a loss. In this way, coping with the loss can serve as an example of how to cope adaptively with inevitable set-backs utilizing cognitive reappraisal or behavioral activation. It is also possible that therapists may try to repair the working relationship by increasing their own facilitative conditions, such as warmth and empathy, in order to help the patient recover from a loss potentially driven by a poor alliance.

Current study

The goal of the current study is to replicate and to extend previous findings on sudden gains in CT for depression, in a sample of patients treated by therapists-in-training. As a consequence, this study will be more representative of therapists delivering CT in routine care settings who are not experts in this modality. However, the current therapists-in-training do differ from most therapists in routine care as they received high-quality supervision and training by a CT-trained clinician throughout the duration of the study to ensure quality treatment and guard against therapist drift. The current protocol
was also more controlled than most naturalistic studies, including such details such as a set treatment length and regular symptom assessment, which help allow for a more direct comparison of results to the existing literature from clinical trials with expert therapists. In this way, conclusions about the role that CT factors, such as cognitive change, play in sudden gains can be drawn with more confidence. Also, any differences found would be more likely attributable to a smaller number of remaining differences between the current study and the other clinical trials, such as therapist experience in CT. In addition, this study will follow-up on a new method of examining symptom deterioration by highlighting large between-session losses and rating the sessions immediately before and after these self-reported sudden losses.

Several process variables will be measured, including those thought to be specific to CT (e.g., within-session cognitive change; therapists’ adherence to CT techniques, including behavioral methods/homework, cognitive methods and negotiating/structuring content) and those thought to be common across psychotherapies (e.g., therapeutic alliance, facilitative conditions). In this way, the goal of the study is to achieve greater insight into the mechanisms of CT using a more advanced analysis focused on critical therapy sessions.

A primary aim of the study is to test whether the potential positive effects of sudden gains can be replicated in a sample of novice therapists. Thus, Hypothesis 1 is that people who have experienced a sudden gain in treatment will be more likely to have better treatment outcomes at the end of the treatment period than those who did not experience a sudden gain, in a sample of inexpert therapists. It is also predicted that these
clients will have a lower relapse rate over a 12-month follow-up period (Hypothesis 2). Sudden losses are not predicted to be related to outcome. Although sudden gains may mark a transitional period and begin an “upward spiral” of change (Tang & DeRubeis, 1999), sudden deteriorations may not necessarily signal a downward spiral, but rather indicate that the direction of treatment may need to be adjusted, with positive outcomes still a reasonable possibility (Thompson, Thompson & Gallagher-Thompson, 1995). However, while no relationship is expected, this relationship between sudden losses and outcome will also be examined.

A second aim of this study is to understand the types of changes that clients experience surrounding a sudden gain. The analyses conducted by Tang and colleagues (Tang & DeRubeis, 1999; Tang, DeRubeis, Beberman & Pham, 2005; Tang, DeRubeis, Hollon, Amsterdam & Shelton, 2007) will be replicated from which they discovered that clients with sudden gains demonstrated higher levels of cognitive change in the session immediately prior to the gain as compared with a neutral/control session and that this elevated level will continue through the next treatment session (Hypothesis 3). It is expected that positive symptom changes will encourage positive changes in the therapeutic relationship, thus it is anticipated that the alliance scores will be greater in post-gain sessions, as compared to both pre-gain and neutral sessions (Hypothesis 4). The predicted results would show partial support for Tang and DeRubeis’s (1999) notion of an upward spiral of the therapeutic relationship in conjunction with positive symptom change. A final component of this aim is a set of exploratory analyses designed to determine whether other process ratings – alliance, therapist adherence (broken down into
three categories: behavioral methods/homework, negotiating/structuring content, and cognitive methods), facilitative conditions, and patient facilitation of CT – are predictive of sudden gains. If any of these factors are predictors, then therapists can be better informed about which actions may be more beneficial for them to pursue in the hopes that clients may experience a sudden gain.

The third and final aim of the study is to explore the factors surrounding sudden losses during treatment. The goal is to identify therapeutic factors that precede a sudden loss to help therapists anticipate (or preclude) symptom deterioration. For example, if a poor alliance is identified as a predictor of a loss, it may be constructive to address a deficient therapeutic relationship earlier in treatment. However, in order to inform therapists as to how to best respond to sudden losses, it is perhaps more important to examine the process ratings of therapeutic factors in the post-loss session and the relation to the clients’ symptom level in the following session. Exploratory analyses will be run to determine whether any specific therapeutic techniques meant to facilitate recovery from a loss may result in subsequent symptom improvement. For example, it is possible that a loss will not have a significant impact on overall therapeutic progress if therapists increase facilitative conditions (e.g., warmth, empathy, supportive encouragement) in post-loss sessions to strengthen the relationship and assuage possible tension from previous last session. Or it may be true that employing specific CT strategies after a loss may be more beneficial to recovery. For example, it might be possible that shifting a client’s focus to behavioral strategies or pursuing cognitive reappraisal will allow them to better recover from their acute depressive symptoms.
Chapter 2: Methods

Patients. Participants were 41 participants taken from a sample of people who presented for treatment of depression at the Depression Treatment and Research Clinic at the Ohio State University. This sample was taken from an original 67 people enrolled in the treatment study; following the protocol set by Tang and DeRubeis (1991), patients were removed if they had fewer than eight cognitive therapy (CT) sessions and a BDI less than 15 at session one. In this way, we capture clients who received a substantial dose of CT and were adequately depressed when treatment started. All patients were given a primary current diagnosis of major depressive disorder (MDD) as measured by the Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 2002) and gave informed consent to enroll in a study to participate in 16 weeks of CT for MDD as well as a follow up period of up to 12 months. Excluded from the study were those who had a history of bipolar I disorder or psychosis, current primary Axis I diagnosis other than MDD, a history of substance dependence in the past six months, a subnormal intellectual potential (IQ ≤ 80; testing to be initiated only if clinically indicated), a clear indication of secondary gain (e.g., court ordered treatment) or current suicide risk sufficient to preclude treatment on an outpatient basis. See Figure 2 for a review.

In the current sample of 41, 23 (56%) were female, 37 (90%) were white, 23 (56%) were never married, and 38 (92%) had at least some college education. Complete
demographic information can be found in Table 1. In addition, 14 (34%) were taking antidepressant medication upon inclusion in the study; all clients were asked to maintain a stable dosage of medication and, if not already prescribed, not to start a new drug regimen. Thirteen (31%) met criteria for at least one Axis II disorder, predominantly cluster C disorders ($n = 12$).

**Therapists.** Four therapists (three female and one male) provided CT in the study. All therapists were advanced graduate students at the Ohio State University with two to three years of clinical experience.

**Raters.** Ten undergraduate students from the Ohio State University served as raters. They attended a two-hour seminar to provide them with background information on central elements of the study, including information on depression, CT, and a review of the rating manual. Raters all completed a training sequence comprised of watching and coding multiple CT sessions per week over a 10 week period. During this time, raters also attended weekly meetings to review and discuss their ratings, and received corrective feedback as needed. This process culminated in approximately 50 hours of training over the course of 10 weeks.

All sessions were reviewed by three independent raters. Three ratings per session were used, as the average of three raters yields improved reliability. Coders remained blind to each others’ ratings, the hypotheses of the study, and the overall outcome for each patient. Raters were also blind to session type (control, pre-gain, or post-gain), and DVDs were labeled with codes (“G” = pre-gain, “L” = pre-loss, “PG” = post-gain, “PL”
= post-loss, “C” = control); according to a post-data collection survey, coders reported that they did not decipher what these labels represented. Sessions to be rated by each rater were quasi-randomly derived, with the restriction that each coder did not watch two consecutive sessions in order to reduce potential bias that may be related to knowledge of a patient’s previous therapy session. While coders were blind to the hypotheses and general purpose of the study, they were informed that a later session is not a reliable indicator of patient outcome and therefore each session should be treated as a separate entity; for example, a sudden loss can occur later in treatment than a sudden gain for a given client, but that loss should not be construed as an marker that the client did not respond to treatment. The order in which each rater complete ratings of his or her assigned sessions was randomized, with the exception that multiple sessions per patient be separated by at least one week. Therefore, the raters’ scores are likely not biased by expectations associated with symptom improvement or deterioration. Meetings were conducted periodically to guard against rater drift across time.

Measures

Diagnostic Measures

Structured Clinical Interview for DSM-IV. The Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Miriam & Williams, 2002) was used to assess whether participants meet DSM-IV criteria for current MDD and any other Axis I conditions; clients who were assessed to have a primary diagnosis other than MDD were excluded and given referral information for treatment.
Longitudinal Interview Follow-up Evaluation. The Longitudinal Interview Follow-up Evaluation (LIFE; Keller, Lavori, Friedman, Nielson, Endicott, et al., 1987) was used at the 6- and 12-month follow-up assessments to determine whether patients met SCID criteria for MDD at any time between evaluations. Clients were excluded from the 12-month assessment if they were found to meet MDD criteria in the six months after post-treatment.

Depressive Symptoms

Beck Depression Inventory - 2nd Edition. The Beck Depression Inventory-II (BDI; Beck, Steer & Brown, 1996) is a self-report assessment that was used as the measure of the severity of session-to-session depression symptoms. The BDI is a 21-item inventory which captures affective, cognitive and somatic symptoms of depression. It is a widely used measure which evidence suggests is a reliable and well-validated measure of depressive symptom severity. The BDI was collected at the beginning of each treatment session and is the primary outcome measure utilized in identifying sudden gains and sudden losses.

Hamilton Rating Scale for Depression. The modified 17-item HRSD (Williams, 1988) is a clinician administered semi-structured interview that captures somatic, affective and cognitive symptoms of depression, and also allows the interviewer to code both verbal and behavioral responses. For the purposes of defining response in the trial, the HRSD was the only continuous symptom outcome measure used.
Treatment Response

At post-treatment, the SCID and the HRSD were re-administered to determine whether or not clients were considered treatment responders. In order to meet response criteria, clients had to (1) demonstrate on the SCID that they did not meet MDD criteria and (2) score below a 12 on the HRSD.

Therapeutic Alliance

Working Alliance Inventory. The alliance was assessed using the abbreviated 12 item version (Travey & Kokotovic, 1989) of the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989). The WAI was developed as a transtheoretical measure of alliance and is one of the most commonly used measures of alliance to date (Martin, Garske & Davis, 2000). The scale is based on Bordin’s (1979) definition of the working alliance as comprised of three components of the therapeutic relationship, including overall agreement on treatment goals and the appropriate tasks to focus on in order to achieve those goals, as well as the affective bond between the therapist and the patient.

Therapist and Client Factors

Therapist Adherence. The 28 items included in the Cognitive Behavioral subscale of the Collaborative Study Psychotherapy Rating Scale (CSPRS; Hollon et al., 1988) were used to rate therapist adherence to CT. Items are scored on a seven point scale, with higher scores reflecting greater frequency and extent of therapist adherence. These items have been used to rate adherence in previous studies of CT (e.g., DeRubeis, Hollon, Evans, & Bemis, 1982; Hill, O'Grady, & Elkin, 1992) and were the basis of the Concrete
and Abstract adherence rating scales used in two previous studies (DeRubeis & Feeley, 1990; Feeley et al., 1999). In the current study items were separated into three subscales of therapy-specific techniques, as utilized in Strunk, Brotman and DeRubeis (2010), originally identified by Strunk, Cooper, Ryan, DeRubeis and Hollon’s (2012) factor analysis: the 10-item Cognitive Methods subscale evaluates therapists’ efforts to help the patient to evaluate and restructure his or her thoughts (e.g., “Did the therapist help the client to use currently available evidence or information (including the client’s prior experiences) to test the validity of the client’s beliefs?”); the 7-item Negotiating/Structuring subscale evaluates therapists’ efforts to negotiate therapy content and to maintain a structure throughout the course of the therapy session (e.g., “Did the therapist work collaboratively with the client to formulate and follow a specific agenda for the session?”); and the 5-item Behavioral Methods/Homework subscale evaluates use of behavioral strategies and the homework (e.g., “Did the therapist work with the client to schedule plan OR to practice alternative overt behaviors for the client to utilize outside of therapy?”).

Facilitative Conditions. The eight items in the Facilitative Conditions subscale of the Collaborative Study Psychotherapy Rating Scale (CSPRS; Hollon et al., 1988) will be used to rate the degree to which the therapist attempts to assist in the progress of treatment. Items tap into whether the therapist conveyed warmth, was involved in the session, and had an interesting style of communication, for example. Items are scored on a seven point scale, where higher scores correspond to increased frequency and extent of the behavior of interest.
Client Facilitation. Nine items were created to encapsulate various behaviors that the clients may demonstrate that are expected to facilitate therapeutic change or cause potential rifts in the therapeutic process, specifically within the context of CT. Again the items were scored on a seven point scale with higher scores depicted an increased rate of occurrence.

Cognitive Change

Patient Cognitive Change Scale. Items from the Patient Cognitive Change Scale (PCCS; Tang & DeRubeis, 1999) were utilized to assess the extent of reported cognitive changes and therapeutic progress. There are four categories of possible progress towards cognitive change: (1) bringing a belief/schema into awareness; (2) identifying an error in cognitive process, belief or schema; (3) arriving at new belief about specific issue; and (4) accepting a new cognitive technique. Items were rated on a seven point scale, including 0 (“No Progress”), 1 (“Possible/ Potential Progress”), 3 (“Definite Progress”), and 6 (“Extraordinary Progress”).

Procedure

Treatment and Follow-up Periods

All eligible and interested patients were enrolled in 16 weeks of CT for MDD. Patients who scored a 20 or higher on the HRSD were offered to begin with two sessions per week for the first month while those who scored less than 20 were offered sessions once per week. However, the average number of sessions in the first month of treatment did not significantly different between these groups, with the lower severity patients tallying an average of 5 sessions and the higher severity patients averaging 5.3 sessions in
the first month. The average number of sessions attended by the patients included in the current study was 15.4.

Patients who were determined to be treatment responders after 16 weeks (no longer meeting MDD diagnostic criteria on the SCID and a HRSD score of less than 12) were included in the follow-up period. Assessments were scheduled for six and 12 months following treatment end. However, if clients were found to meet MDD criteria (as assessed by the LIFE) at any point in the period of time between post-treatment and the 6-month assessment, they were considered relapsed and were not assessed at the 12-month period.

Identification and Definition of Sudden Gains and Losses

Sudden Gains

Tang and DeRubeis (1999) proposed basic criteria for defining sudden gains as follows:

The magnitude of a sudden gain should be large (a) in absolute terms, (b) relative to depressive symptom severity before the gain, and (c) relative to symptom fluctuations preceding and following the gain. (p. 895)

Tang and DeRubeis (1999) suggested operationalizing this definition as follows:

A sudden gain occurred between Session N and Session N + 1 if (a) the gain was at least 7 BDI points (BDI_N – BDI_{N-1} ≥ 7); (b) the gain represented at least 25% of the pregain session’s BDI score (BDI_N – BDI_{N-1} ≥ 0.25 × BDI_N); and (c) the mean BDI score of the three therapy sessions before the gain (Sessions N – 2, N – 1, and N) was significantly higher than the mean BDI score of the three therapy sessions after the gain (Sessions N + 1, N + 2, and N + 3) using a two-sample t test with an alpha of .05. (p. 895)
Authors in this literature have acknowledged that the exact criteria for defining sudden gains are somewhat arbitrary. Investigators have proposed potential criticisms of these criteria and potential revisions of the criteria to be used. Several studies (Stiles, et al., 2003; Hardy, et al., 2005; Tschitsaz-Stucki & Lutz, 2009) have made modifications to the Tang and DeRubeis (1999) criteria by utilizing the reliable change index (RCI), which identifies a change as reliable when a pretreatment-posttreatment difference divided by the standard error of the difference is equal to or greater than 1.96 (see Jacobson & Truax, 1991). This approach allows researchers who utilized other measurements to capture symptom change to identify comparable cut-off points for sudden gains in their data sets. However, the current study utilizes the BDI and Hardy and colleagues calculated the RCI for the BDI in their dataset at 7.16, confirming that Tang and DeRubeis’s selection of seven points was a reasonable choice for a notable change in the BDI. Therefore, we will retain the original magnitude of a seven point change in BDI for defining sudden gains in the current dataset.

The second criterion merely acknowledges that the change should be large relative to previous depressive symptoms. In general, researchers have found that this criteria would have very little impact on classification of sudden gains if it were dropped: Tang et al. (2005) noted that it only affected two of 83 patients; Stiles et al. (2003) found that it only increased the number of clients with sudden gains by one out of 125 diagnostically heterogeneous patients in routine care; and Hardy et al. (2005) reported that no additional sudden gains patients were added if the criteria were dropped (out of a total of 76 patients in CT for MDD). Therefore, the criteria that a gain must represent at
least 25% reduction of the symptoms reported at the pre-gain session was not used in the present study.

The third criterion that symptom change needed to be stable was, however, found to be the most consequential criterion when Stiles et al. (2003) tested variations within their sample to see the effect on the number of sudden gains identified – when the criterion was excluded from consideration, the number of clients experiencing sudden gains jumped dramatically from 23 to 75. Thus, the third criterion relative to symptom fluctuation will be retained, but modified as per Hardy et al. (2005), who reasoned that, rather than submitting the gains to a \( t \) test of significance, they would treat it as a descriptive statistic and use the value of \( t \geq 2.50 \). In this way, the criterion is slightly more liberal than Tang and DeRubeis, as \( p = .05 \) when \( t = 2.78 \), but the changes also allow us to consider sudden gains that happen earlier – between sessions 2 and 3 – by requiring gains with only two preceding sessions to have a value of \( t \geq 3.0 \) (\( p = .05 \) when \( t = 3.19 \)). Adapting the criteria in such a way allows the inclusion of earlier gains (before the third session); it is important to make this modification because the rate of symptom change tends to be greatest early in treatment (Ilardi & Craighead, 1994).

**Sudden Losses**

While sudden gains (i.e., rapid and lasting symptom improvements) have been well documented across several studies, less attention has been paid to sessions to session symptom worsenings (i.e., sudden losses). As patients on average improve significantly across the course of treatment, a sudden loss that is sustained is not likely to be common. Nonetheless, the investigation of sudden losses (even if not sustained) may provide a
valuable approach to improving our understanding of the process of change in CT. It may be that, unlike sudden gains, sudden losses do not predict the outcome of treatment. Instead, these marked losses could be perceived by the therapist as an indication of the need to change strategies or repair the therapeutic relationship. Therefore a loss could potentially serve as an opportunity to make a turning point towards improvement or merely represent a transient setback. With this in mind, we maintained the absolute magnitude criterion but dropped the criteria regarding relative magnitude and relative symptom fluctuation. Thus, the only criterion for identifying a sudden loss was a drop of seven BDI points (as per the first criterion described above) between session intervals.

Session selection

Sudden gains and sudden losses were identified by the BDI scores collected at the beginning of each session, as described above. Three sessions were selected to be rated for each sudden gain or sudden loss occurrence: the pre-gain/loss session, defined as the session directly preceding the sudden gain or loss; the post-gain/loss session, defined as the session immediately following the gain or loss; and the control session, typically the session before the pre-gain session (a few exceptions were made when a recording was not available for the session before the pre-gain session and a random session was chosen). Thus, the temporal sequence is as follows: control session (N-1) \( \rightarrow \) pre-gain/loss session (N) \( \rightarrow \) sudden gain or loss \( \rightarrow \) post-gain/loss session (N+1).
Chapter 3: Results

Inter-Rater Reliability of Ratings

Random effects intraclass correlation coefficients (ICCs) were calculated in order to assess the interrater reliability of the process ratings. ICCs were corrected for the number of coders per session in order to derive a measure of the reliability of the average of three raters’ judgments. The ICCs were: .78 for the alliance, .77 for Patient Facilitation, .75 for Cognitive Change, .68 for Behavioral Methods, .68 for Negotiating Structuring, .67 for Cognitive Methods, and .55 for Facilitative Conditions.

Sudden Gains

In the current sample, 24 of 41 (58%) patients reported a sudden gain, with 12 (50%) of these patients experiencing more than one sudden gain over the course of treatment for a total of 39 sudden gains. Sudden gains were observed throughout the duration of therapy, but the median 50% of pre-gain sessions fell between the 4th and 9th session, with the full range between sessions 2 and 19 for all gains (when looking at first gains only, the range was between sessions 2 and 13). The mean was the 5th session, the median the 4th session, and the mode the 3rd session. These numbers are similar to those found in previous studies where the median pre-gain session has been between 5 (Tang et al., 1999, Tang et al., 2005) and 8 (Tang et al., 2005).

On average, clients attended 15.4 (SD = 3.0) sessions over the course of the 16-week treatment protocol. People who experienced a sudden gain attended an average of
16.1 (SD = 3.4) sessions, which was numerically more than those who did not have a sudden gain at 14.4 (SD = 1.9) sessions. This difference was nearly statistically significant ($t(39) = -1.88, p = .07$) with a medium effect size (Cohen’s $d = .60$; Cohen, 1977), suggesting that people who experienced a sudden gain may be more likely to attend more sessions.

The mean magnitude of sudden gains was 11.2 BDI (SD = 4.7) points. The overall magnitude of change from intake to post-treatment was 18.6 (SD = 11.5) BDI points for all clients in the current sample and 21.2 (SD = 12.4) points for those who reported a sudden gain. Thus, for clients who experienced sudden gains, the BDI change associated with a sudden gain accounted for 52% of the overall symptom improvement these clients experienced. These numbers are similar to previous studies of sudden gains in CT, both in terms of sudden gain magnitude (11.2 in Tang & DeRubeis, 1999; 11.5 in AT and 10.2 in CT in Tang et al., 2005; 11.0 in Tang et al., 2007) and percent of overall symptom change accounted for (51% in Tang & DeRubeis, 1999; 59% in Tang et al., 2005).

Of the 24 people who experienced sudden gains, 14 (58%) experienced a reversal, defined as losing 50% of the symptom improvement achieved in the sudden gain. For example, if a client reported a BDI of 25 at the pre-gain session and a BDI of 15 at the post-gain session, then a reversal would be counted if the client reported a subsequent BDI score of 20 or higher. The percent of reversals found is higher than other studies of CT for MDD (17% in Tang & DeRubeis, 1999; 40% in Tang et al., 2005; 37% in Tang et al., 2007; for a review of all reversal rates, see Table 2), suggesting the gains achieved in
the current study may be less stable than previous findings. In order to provide a comparison, we assumed the percent reversal rates from the original study of sudden gains (Tang & DeRubeis, 1999) and conducted a chi-squared test against our own reversal rates; this difference in reversal rate was statistically significant ($\chi^2 (1, N = 48) = 8.89, p = .003$). Similarly, when using a combination of the three clinical trials of CT for MDD as a comparison (Tang & DeRubeis, 1999; Tang et al., 2005 (CT only); Tang et al., 2007), the combined reversal rates were also significantly different from the current findings ($\chi^2 (1, N = 92) = 5.67, p = .02$). However, when we used a combination of the remaining studies of sudden gains to assess whether our reversal rates differed when compared to a combination of treatment modalities for MDD; this difference was not significant ($\chi^2 (1, N = 188) = 1.91, p = .17$). Thus, while the current reversals appear to be statistically higher than the clinical trials of CT for MDD, they are not significantly different than the rates found in other treatment modalities as well as CT in a community setting. Furthermore, by the end of treatment 11 of these 14 (78.6%) clients recovered their symptom improvement.

**Do sudden gains predict better post-treatment outcome?**

We hypothesized that having a sudden gain would predict a superior outcome at post-treatment. However, unlike previous studies on sudden gains in CT, a regression analysis controlling for intake severity (i.e., BDI score at intake) failed to find that the occurrence of a sudden gain predicted the last reported BDI score ($F(40) = .21, p = .82$). While clients who experienced sudden gains reported a greater change in BDI (21.2, SD = 12.4) than non-gainers (14.9, SD = 8.2) at a trend level ($d = .56, t(39) = -1.76, p = .09$),
there was no statistical difference ($t(39) = .6, p = .55$) between the final BDI scores of the sudden gainers ($M = 9.3, SD = 8.7$) and the non-gainers ($M = 11.1, SD = 7$). This discrepancy between finding a nearly significant difference in change scores but no difference in final BDI can, in part, be accounted for by the differences in intake BDI between the groups (SGs = 30.8, non-SGs = 26.1), which was a statistical trend ($d = .63$, $t(39) = -1.97, p = .06$). However, by the time treatment started, the differences in symptom levels between these groups had numerically evened out, as evidence by the lack of statistical significance ($d = .51, t(39) = -1.58, p = .12$) between BDI scores at the first therapy session.

Another, albeit less sensitive, way of conceptualizing outcome was overall response criteria for the study. Sixty-two percent (16/26) of the treatment responders in the current sample experienced a sudden gain. While numerically more sudden gainers achieved response at the end of treatment than non-sudden gainers (66% vs. 58%), having experienced a sudden gain did not significantly predict response in a logistic regression analysis controlling for intake severity ($OR = 1.47, \chi^2 = .31, p = .58$).

*Are people with sudden gains at a lower risk of relapse?*

Of the treatment responders, three did not provide follow-up data at either the 6- or 12-month assessments (2 sudden gainers, 1 non-sudden gainer), leaving 23 clients available for the analysis of relapse risk. Of these clients, 9 of 14 (64%) sudden-gainer-responders and 2 of 9 (22%) non-sudden-gain-responders relapsed by the final 12-month assessment. The direction of this difference was contrary to expectations. In a survival analysis with the end-of-treatment BDI score included as a covariate, the occurrence or
absence of a sudden gain was not found to predict a reduced risk of relapse, \( \chi^2 (1, 41) = 1.76, \text{hazard} = 1.73, 95\% \text{ confidence interval [CI]} = .92, 2.54, p = .18 \).

*Will sudden gains be preceded by increased levels of cognitive change?*

In the following section, analyses focus on the rating data surrounding the first sudden gain for each patient. For 5 of the 24 patients who experienced a sudden gain, the pre-pre-gain session was not available to rate. Therefore, analyses focus on the 19 clients for whom the relevant data were available.

We hypothesized that there would be a significant difference in cognitive change found between the control session and both the pre-gain and post-gain sessions, but no difference found between the pre- and post-gain sessions. A repeated measures Analysis of Variance (ANOVA) with contrasts (i.e., control versus pre-gain, control versus post-gain, and pre-gain versus post-gain) was run to test this hypothesis, controlling for BDI scores at intake. The overall effect was nearly significant \((F(17) = 3.54, p = .052, R^2 = .10)\). However, as shown in Figure 3, the differences identified through the contrasts were not consistent with expectations. Instead, cognitive change was found to be significantly higher in the control sessions than in the post-gain sessions \((d = 1.25, t(17) = 2.57, p = .02)\). A similar difference was found between the control session and the pre-gain session, although this finding was not statistically significant \((d = .78, t(17) = 1.6, p = .16)\). As anticipated, there was no difference between pre- and post-gain cognitive change scores \((d = .23, t(17) = .48, p = .64)\). For a review of the means and standard deviations of these variables, see Table 3.

*Will sudden gains be followed by an increase in the alliance?*
It was expected that there would be significant differences in the alliance scores measured at the post-gain session as compared to the pre-gain and control sessions, but no differences found between the control and pre-gain sessions. A repeated measures ANOVA was run with planned comparisons and controlling for BDI at intake. No significant differences were found in the alliance ($F(17) = .01, p = .99, R^2 = .004$), thus failing to support the hypothesis. Despite these null results, we looked at the specific planned contrasts for descriptive purposes. These contrasts showed no significant differences in alliance between any of the session pairing, including control versus pre-gain ($d = .04, t(17) = -.09, p = .93$), control versus post-gain ($d = .01, t(17) = -.03, p = .97$), and pre- versus post-gain sessions ($d = .02, t(17) = .04, p = .97$).

Additional analyses

Do certain patient characteristics further inform these findings?

In an attempt to find a possible explanation for these results that did not support – and were in the reverse direction of – our expectations, we made an effort to identify if our sample may have contained some unusual patient characteristics. We wanted to explore whether we would have obtained the expected pattern of results in a subset of patients and whether it was a special subset of patients who were driving the effect that we found. Several variables were considered as potentially important contextual factors for treatment response. These factors of interest included sex, as some research has shown that women are more likely to prefer and be accepting of therapy in general (Churchill et al, 2000; Dwight-Johnson et al., 2000), as well as Axis II diagnosis and initial severity, because these factors have been known to moderate treatment outcomes.
(e.g., Fournier, DeRubeis, Shelton, Gallop, Amsterdam, & Hollon, 2008; Driessen, Cuijpers, Hollon, & Dekker, 2010).

When looking at Cognitive Change, a significant interaction was found between the presence of an Axis II diagnosis and the level of Cognitive Change at each session type (control, pre-gain, and post-gain) with a large effect size ($d = .97$, $F(16) = 3.88$, $p = .04$). This interaction suggests that patients \textit{without} an Axis II diagnosis may have been driving the unanticipated pattern of cognitive change, as they present significantly higher Cognitive Change scores in the control sessions than either of the pre- or post-gain sessions (see Figure 4). The pattern of Cognitive Change for clients who were diagnosed with Axis II disorders was in the anticipated direction, with Cognitive Change scores higher in the pre- and post-gain sessions as compared to the control sessions. However, when limiting the dataset to those clients with Axis II diagnoses, this effect was not significant ($F(4) = .18$, $p = .84$), likely due to the fact that the sample size for these analyses was extremely small ($n = 6$). Neither of the other variables (i.e., sex, intake severity) significantly interacted with of Cognitive Change (all $p > .05$).

The only pre-treatment variable that approached moderation of the association between alliance and sudden gains was sex, and this was only at the level of a non-significant trend ($d = .82$, $F(16) = 3.27$, $p = .06$; all other $p > .10$). In terms of the direction of the effect (see Figure 5), the pattern for men was contrary to expectation in that they had a tendency to experience an increase in alliance between control and pre-gain sessions (i.e., before reporting a gain), but then experience a sharp decrease in alliance in the post-gain session (i.e., immediately after the sudden gain). Women,
however, were more likely to display the anticipated pattern consisting of a relatively
equal alliance level at control and pre-gain sessions, but an increase in alliance post-gain,
when they returned to session with marked symptom improvement. The magnitude of
these effects were also notable when separating by sex, as there are large effects for all
session intervals for men, including between control and pre-gain sessions ($d = .99$),
control and post-gain sessions ($d = 1.42$), and pre- and post-gain sessions ($d = 1.91$). For
females, large effects were found for the intervals between the control and post-gain ($d =
.99$) and the pre- and post-gain sessions ($d = .85$). However, while the effects found for
each individual sex were large, potentially suggesting that the direction of the effects is
meaningful, they were not statistically significant ($p > .05$). It is likely that the analyses
were underpowered to find a significant effect because of the small sample sizes (women
= 12, men = 7), but the fact that this was a trend level interaction and not statistically
significant leaves us unable to draw a firm conclusion about the effects.

*Do therapist adherence variables change as a function of sudden gains?*

As described above, repeated measures ANOVAs with planned comparisons were
run for each of the three adherence factors, controlling for BDI at intake, to assess
whether there were variations between these factors at the different session types
(control, pre-gain, post-gain). A significant association was found for Behavioral
Methods / Homework ($F(17) = 4.62, p = .02, R^2 = .09$) and Negotiating / Structuring ($d =
.92, F(17) = 3.79, p = .04, R^2 = .14$). However, as with Cognitive Change, the direction of
the relationship was counter to expectations in that both adherence factors were found to
be higher in the control session than both the pre-gain and post-gain sessions (see Figure
As can be seen in Table 4, there were significant differences between the control session and both the pre- and post-gain session with the Negotiating / Structuring factor, while Behavioral Methods / Homework was significantly higher in the control versus post-gain comparison and trended to be higher in the control versus pre-gain comparison.

*Does patient facilitation of therapy influence sudden gains?*

Another possibility is that the extent patients facilitate the therapeutic process might influence the occurrence of sudden gains, thus another repeated measures ANOVA was run with Patient Facilitation. A statistical trend was found for the overall effect ($d = .73, F(17) = 2.99, p = .08$). Again, the control session had a significantly higher level of Patient Facilitation than the pre-gain session ($d = 1.07, t(17) = 2.21, p = .04$). No significant differences were found between the control and the post-gain sessions ($d = .43, t(17) = .88, p = .39$) or the pre-gain and post-gain sessions ($d = .57, t(17) = -1.17, p = .26$).

*Sudden Losses*

In the current sample, 18 of the 41 patients (44%) identified experiencing a sudden loss, with 7 of these patients experiencing more than one for a total of 29 sudden losses. As with sudden gains, sudden losses were seen across treatment and pre-loss sessions ranged from session 2 to session 17. However, on average, sudden losses were typically seen later in treatment than sudden gains, with the mean pre-loss session at session 8 and the median 50% falling between sessions 5 and 11 (as compared to sudden gains which fell between session 3 and 7). The average size of the loss was an increase in
BDI of 11.1 (SD = 4.3) points, a similar magnitude to the average 11.2 point decrease of sudden gains.

Do sudden losses predict outcome?

As with sudden gains, a logistic regression was run, controlling for intake BDI, to determine if the occurrence of a sudden loss predicted response status; the results were not significant (OR = .53, $\chi^2 = .87, p = .35$). However, in a regression analysis controlling for intake BDI, sudden losses were found to significantly predict the final BDI score attained ($d = .53, F(40) = 3.33, p = .047$). Clients who experienced a sudden loss during treatment were more likely to have higher BDI scores than those who did not report such a loss. However, over 50% (10/18) of people with sudden losses still met response criteria at the end of treatment (i.e., no longer met criteria for MDD and HRSD score > 12). Therefore experiencing an abrupt worsening of symptoms in CT does not necessarily predict an overall negative outcome, but it suggests that people with sudden losses who meet response criteria will do so with higher symptom levels.

Do sudden losses during acute treatment predict relapse?

Of the 10 people with sudden losses that met response criteria, seven relapsed during the follow-up period, whereas only three of the eight treatment responders without sudden losses relapsed. In a survival analysis, sudden losses were found to predict risk of relapse at a trend level ($\chi^2 (1, 41) = 3.60$, hazard = 2.13, 95% CI = 1.26, 2.91, $p = .06$) in that people who had a sudden loss during the treatment period were at a greater risk of relapse than those who did not. However, when the final BDI score of acute treatment
was included as a covariate, the effect was no trending ($\chi^2(1, 41) = 1.68$, hazard = 1.77, 95% CI = .91, 2.63, $p = .20$).

**Additional Analyses**

*Do any process variables change as a function of sudden losses?*

Sessions surrounding sudden losses were also selected to be rated for Cognitive Change, alliance, adherence, Patient Facilitation, as well as Facilitative Conditions. Five people did not have a control session available prior to the sudden loss, thus the sample size for the following analyses is 13.

While there were no explicit hypotheses about the possible associations between process variables and sudden losses, we thought perhaps therapists might attempt to repair the relationship after a reported gain, thus there may be an increase in Facilitative Conditions. All process variables were run through repeated measures ANOVAs, controlling for intake BDI, to assess any potential relationships with the sudden loss sessions. No significant relationships were found (all $ps > .05$).
Chapter 4: Discussion

Sudden Gains

The primary aim of this study was to assess whether previous findings of positive implications for sudden gains in CT could be replicated in a sample of novice therapists in training. Specifically, past research has suggested that people who experience sudden gains in CT are more likely to have lower symptoms at post-treatment than those people who did not experience sudden gains. Treatment responders who had sudden gain were also more likely to maintain these improvements as much as 18 months after treatment (Tang & DeRubeis, 1999) and were less likely to experience a recurrence of depression over a two year period following CT completion (Tang, et al., 2007). Contrary to what was hypothesized, there was no evidence in the current sample that people with sudden gains experienced better outcomes, either in terms of overall symptom change or likelihood of meeting response criteria (i.e., no longer meeting SCID criteria for MDD and a HRSD < 12). People with sudden gains did trend towards experiencing greater change in BDI scores from intake to post-treatment than those who did not have a sudden gain. However, this may be accounted for by the fact that they also trended towards higher BDI scores at intake, therefore there was more room for change. Similarly, we failed to find evidence that treatment responders with sudden gains were at lower risk of relapse over the course of 12 months post treatment.
The current study does have methodological differences from previous studies of sudden gains in CT for MDD that might account for the discrepancy in results. For instance, the current study did not control for patient medication whereas previous studies randomized patients to receive either CT or be treated with medication (or did not allow any patients to be on any type of psychotropic medications). This lack of randomization creates noisier data, especially in the follow-up period because, while patients were asked to maintain a stable medication regime in the acute phase, they could change their treatment strategies at will after they completed the 16 weeks of CT. It is also possible that patients did not follow protocol and changed medication while they were in CT; if this was the case, there is a possibility that an alteration of psychotropic medication could have influenced a sudden gain.

A second aim of this study was to explore what types of changes may be occurring in terms of the therapeutic process within the sessions immediately surrounding the sudden gains. Again, contrary to expectations and previous research, there was no evidence that patients with sudden gains demonstrated a greater level of cognitive change in the session preceding the reported gain (the pre-gain session). In fact, there was evidence to suggest that people with sudden gain actually exhibited more cognitive change two sessions prior to the reported change (the control, or pre-pre-gain session) than in the pre- or post-gain sessions. Similarly, we also failed to find evidence of an improved alliance score in the session after a gain was reported, as predicted based on past findings.
One pre-treatment variable was found to significantly moderate these results: the presence of an Axis II diagnosis moderated cognitive change. Namely, it appears that people with a comorbid personality disorder displayed the anticipated pattern of cognitive change, such that cognitive change scores improved immediately prior to the reported gain; however, we lacked power to detect whether this pattern was significant. Patient sex trended in moderation of the alliance, where women demonstrated the expected significant increase in observed alliance scores after a sudden gain whereas men experienced a significant increase before a sudden gain and a sharp decrease after a gain. Again, we were underpowered to make firm conclusions about these patterns.

A third aim of the current study was to explore the relationship between other process variables and sudden gains. While previous research found no significant associations with therapist adherence, we found a similar unanticipated pattern of results to that of cognitive change: greater levels of Behavioral Methods / Homework and Negotiating / Structuring were found in the pre-pre-gain (control) session as compared to either the pre- or post-gain sessions. Similarly, Patient Facilitation was also found to be significantly higher in the control session than the pre-gain session. Again, the direction of these relationships was contrary to what may have been expected, suggesting that the control sessions in the current sample were of higher quality and more productive than the session prior to a reported sudden gain.
Explaining a failure to replicate?

While we do not have one defining reason to justify these results, which not only failed to replicate previous research but also established a dissimilar pattern of change, we outline several potential contributing factors below. One possible explanation for the current results is that novice therapists were not able to capitalize on an important window of change in CT. The percentage of sudden gains and the overall magnitude of change reported in this dataset were approximately equivalent to previous research, thus it is clear that it was not a lack of sudden gains occurring that drove these null results. The increased number of reversals in this sample, however, alludes to the fact that these sudden gains were less stable and therefore did not have the same predictive validity as found in previous studies. The reversal numbers were found to be more closely aligned with those reported in studies of sudden gains in treatment modalities other than CT; this also may indicate that the gains reported in the current sample with novice therapists were qualitatively more similar to those seen in routine care as opposed to the gains reported with expert CT therapists. Research across modalities demonstrates that sudden gains are likely to occur in a great percentage of treatment courses, thus it is possible that an important skill for a therapist to possess is knowing how to make the most of these sudden improvements. Perhaps this lack of stability suggests that the therapists were unable to effectively take advantage of the opportunity to promote the enduring potential of the CT skills and highlight the importance of client efficacy in producing change.

It is also possible that detection of sudden gains may not have been as sensitive as those found in some previous studies. As discussed in Tang et al. (2007), the timing of
measuring sudden gains is very important in capturing meaningful change. For example, Vittengal et al., (2005) measured BDI at every other therapy session and failed to replicate the positive implications that sudden gains may have on outcome. However, by measuring every other session, Vittengal et al. may have missed some crucial information about symptom change by recording as a sudden gain a combination of more gradual improvement over the course of two sessions. While this change may be meaningful, it would no longer capture the substantial improvement of one between-session interval. It is possible that the current study also miscategorized some of the treatment gains due to the fact that the majority of the clients in our sample began with only one session a week. Thus, while numerically the median session in which our gains occurred (6) was similar to those reported by Tang and DeRubeis (5), it is possible that our gains were actually recorded three weeks later because their patients began treatment with twice weekly sessions. In other words, there is potentially meaningful variation that occurs in smaller between-session intervals that we may have failed to capture and the sudden gains we did capture may have represented a more gradual change over multiple days.

This study not only failed to replicate the findings that an increase in cognitive change precedes sudden gains (and is maintained at least one session post-gain), but instead found a different significant pattern in which cognitive change is higher in the control – or pre-pre-gain – session. One possibility is that the control session represented a session where the therapist was laying a foundation of CT techniques and that it took an additional session for the client to comprehend, utilize, and benefit from these techniques. This idea is partially supported by the fact that two adherence factors – Behavioral
methods / Homework and Negotiating / Structuring – as well as Patient Facilitation were also found to be significantly higher in these control sessions. Thus it appears that this sample working with novice therapists experienced a delay between the “high-quality” CT sessions and their reported sudden gains, representing a longer latency between the “preparation stage” and the “critical session” (Tang & DeRubeis, 1999). This highlights a possible difference between the skill-set of expert therapists and that of therapists in training, in that experts may better capitalize on the timing and demonstrated understanding from clients.

Another potential explanation for the differences found in the current study is unique variation in our treatment sample. As noted, sex interacted with the alliance-sudden gain session association at a trend level, suggesting that women exhibited an improved relationship after a sudden gain whereas a decreased alliance is observed for men after a gain. In another paper from this dataset (Braun, 2011), findings suggest that symptom levels also varied as a function of sex. Specifically, females were more likely to show improvement after sessions in which the therapist employed high levels of Socratic questioning, an intricate skill in delivering CT competently, whereas men were more likely to experience symptom worsening. The combination of these findings suggest that there may be a meaningful difference between men and women in this sample that may be influencing some unexpected findings, such as better receptivity of women to therapy in general.

People with Axis II disorders were also more likely to display the anticipated pattern of cognitive change, namely that they demonstrated greater levels of cognitive
change immediately prior to reporting a sudden gain. One explanation may be that people with personality disorders exhibited a greater understanding of the connection between cognitive change and the overall benefits of CT. However, this conclusion seems unlikely given that research has suggested the presence of Axis II disorders more commonly has a negative impact on treatment course. Thus it seems like another explanation may be more likely. One possibility is that therapists may respond differently to the needs of clients with personality disorders, perhaps by reinforcing more independent skill building and offering more supportive encouragement. Another possibility is that people with Axis II were less likely to experience cognitive change at all because, while the pattern of change was in the anticipated direction, the actual difference in change scores was marginal from session to session. However, we do not have enough direct evidence to support any conclusion and it may be an area for future research.

*Sudden Losses*

Another facet of this study was to explore the relationship of sudden losses to treatment course and outcome. Sudden losses were not found to predict treatment response, but they were found to predict a significantly lower final BDI score than people who did not experience a sudden loss throughout treatment. People who reported these sudden losses also trended to have a greater risk of relapse over the course of the 12-month follow-up period; however, this statistical trend no longer held true after controlling for the post-treatment BDI scores. None of the process variables examined in the sessions immediately surrounding sudden losses were found to significantly change as a function of sudden losses.

56
These results indicate that people who experience a marked increase in symptoms during treatment may not demonstrate as much symptom improvement over the course of treatment as those who did not have a sudden loss. However, the mere fact that a client experiences a worsening throughout the course of therapy does not directly imply that they will not respond to CT, as 56% of people who experienced a sudden loss in the current sample still met response criteria. Having a sudden loss also did not increase the risk of relapse. While there was no association between therapist variables and the sessions surrounding these losses, a stronger overall alliance was found for people who were reporting sudden gains than those who reported sudden losses. It is possible that this effect was merely a consequence of better relationships forming as symptoms improved, but it is also possible that improving the therapeutic relationship has an impact on positive symptom change.

Limitations

This study was distinct in its efforts to combine the use of a clearly defined study protocol of CT for MDD to be better equipped to draw comparisons to clinical trials run by expert therapists. At the same time, by employing therapists in training and wider inclusion criteria, we are also able to evaluate our study against the more naturalistic studies in settings without expert CT therapists. While there are many strengths of the current study design, several limitations should be noted.

First, while the design of the study protocol was clearly outlined and adherence was monitored, it may have been beneficial to more closely align the methodology to the
studies we intended to replicate. For instance, requiring that clients began therapy at two
sessions per week would have mitigated the current concern that meaningful variability
may not have been captured by holding psychotherapy sessions only once per week. We
also employed a different method of rating sessions for cognitive change – Tang and
colleagues utilized a combination of audio tapes and transcripts and our coders watched
videos. While we ensured the importance of combing visual and auditory information
with this one resource, perhaps the addition of transcripts allows raters to more reliably
catch more subtle utterances which may go unnoticed watching a video recording.
Cognitive change was also measured as an average score across session, and not as
individual examples of cognitive change instances as described by Tang and colleagues.
These methodological differences may have had a negative impact in that we were less
able to catch meaningful distinctions.

Another potential limitation of the current study is that the independent raters of
the process variables were all undergraduate students. These students did not have
graduate level training in psychotherapy, but they were also unlikely to have strong
beliefs about any specific theoretical orientation. Relative to graduate students or
professionals, they may have come in to the study with fewer preconceived notions
regarding what therapy “should” look like, as they were not tied to one therapeutic
orientation. For example, if the raters had an opinion regarding who was likely to benefit
from treatment according to their perception of the treatment-specific quality of the
session that they watched, they could bias their ratings (e.g., artificially inflate the ratings
of “good” sessions and deflate ratings of “bad” sessions) so as to increase the process-
outcome association. However, these students were all advanced undergraduates who expressed interest in pursuing higher education in psychology and we employed extensive training as well as repeated exposure to CT sessions in an attempt to attenuate possible short-comings due to their lack of experience. The effect of possible poor reliability of a single rater was also minimized by increasing the reliability with multiple ratings (3) per session.

A third limitation is potential third variables that could be playing an important role in the causality of these findings. One obvious possibility is that an outside positive event, unrelated to therapy, influenced an improvement in depressive symptoms. However, Hardy et al. (2005) determined that sudden gains were not associated with significant life events. Unfortunately there are limitless possibilities of confounding relationships that make it difficult to account for this source of variance. Nonetheless, exploratory analyses of three patient variables (i.e., initial severity, sex, and the presence of an Axis II disorder) were examined and there was no evidence that they accounted for the associations of interest in the current paper. Similarly, we are unable to explain the failure to replicate the positive findings from past research regarding sudden gains in CT for MDD in that people with sudden gains in our sample did not have better treatment outcomes and were not at lower risk for relapse. However, these findings open the possibility for future research, looking more closely at the potential differences between samples and impact of employing novice therapists.
Conclusions

The current study failed to replicate the previous findings that sudden gains predict a better, more enduring treatment response in CT for MDD. Our data also does not support previous findings that sudden gains are in part driven by the client demonstrating cognitive change. In fact, the current study returned a new pattern of association between process variables in the sessions surrounding sudden gains, which may introduce questions regarding the causal implications of the previous findings. It is possible that CT sessions are qualitatively different when run by novice therapists in training as opposed to expert therapists, and in this way the beneficial connotations of sudden gains are also dissimilar. We also found that the occurrence of sudden losses in acute treatment does predict higher post-treatment symptomology, but does not necessarily signify an adverse treatment outcome. Unfortunately we did not identify any predictors of sudden losses or methods of overcoming losses in the current dataset.
References


Appendix A: Tables
<table>
<thead>
<tr>
<th>Variable</th>
<th>Sample (n = 41)</th>
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<tr>
<td>Female, % (n)</td>
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<tr>
<td>Age in years, mean ± SD</td>
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<tr>
<td>Range</td>
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<tr>
<td>Ethnicity</td>
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<td>White</td>
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<tr>
<td>Black</td>
<td>7.3 (3)</td>
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<td>Marital Status, % (n)</td>
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<td>Married or Cohabitating</td>
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<tr>
<td>Not Married</td>
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<td>Income, mean ± SD (in thousands of US $)</td>
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<tr>
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Table 1. Demographic Information.
### Table 2: Reversal Rates from Previous Sudden Gains Research in Treatments of Major Depressive Disorder

<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Treatment</th>
<th>Sample Size</th>
<th>Sudden Gainers</th>
<th>Reversals</th>
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<tr>
<td>Ryan (2012)</td>
<td>CT</td>
<td>41</td>
<td>24</td>
<td>14 (58%)</td>
</tr>
<tr>
<td>Tang &amp; DeRubeis (1999)</td>
<td>CT*</td>
<td>61</td>
<td>24</td>
<td>4 (17%)</td>
</tr>
<tr>
<td>Tang, DeRubeis, Beberman &amp; Pham (2005)</td>
<td>AT</td>
<td>44</td>
<td>16</td>
<td>5 (32%)</td>
</tr>
<tr>
<td>Tang, DeRubeis, Beberman &amp; Pham (2005)</td>
<td>CT*</td>
<td>50</td>
<td>20</td>
<td>8 (40%)</td>
</tr>
<tr>
<td>Tang, DeRubeis, Hollon, Amsterdam &amp; Shelton (2007)</td>
<td>CT*</td>
<td>60</td>
<td>24</td>
<td>9 (38%)</td>
</tr>
<tr>
<td>Hardy, Cahill, Stiles, Ispan, Macaskill, &amp; Barkham (2005)</td>
<td>CT</td>
<td>76</td>
<td>31</td>
<td>10 (32%)</td>
</tr>
<tr>
<td>Kelly, Roberts &amp; Ciesla (2005)</td>
<td>GCT</td>
<td>31</td>
<td>13</td>
<td>7 (54%)</td>
</tr>
<tr>
<td>Tang, Luborsky &amp; Andrusyna (2002)</td>
<td>SE</td>
<td>40</td>
<td>15</td>
<td>7 (47%)</td>
</tr>
<tr>
<td>Andrusyna (2007)</td>
<td>BA</td>
<td>57</td>
<td>26</td>
<td>9 (35%)</td>
</tr>
<tr>
<td>Kelly, Cyranowsk, &amp; Frank (2007)</td>
<td>IPT</td>
<td>185</td>
<td>62</td>
<td>33 (53%)</td>
</tr>
</tbody>
</table>

Notes: CT = Cognitive Therapy, AT = Automatic Thoughts, GCT = Group Cognitive Therapy, SE = Supportive Expressive Therapy, BA = Behavioral Activation, IPT = Interpersonal Therapy

* Randomized clinical trial of CT for MDD
Table 3. Means (and Standard Deviations) for the Process Variables by Session Type
(n = 41)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Session</th>
<th>Pre-Gain Session</th>
<th>Post-Gain Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Change</td>
<td>1.63 (.37)</td>
<td>1.42 (.55)</td>
<td>1.36 (.43)</td>
</tr>
<tr>
<td>Alliance</td>
<td>4.50 (.54)</td>
<td>4.51 (.71)</td>
<td>4.50 (.70)</td>
</tr>
<tr>
<td>Behavioral/ HW</td>
<td>1.10 (.57)</td>
<td>0.88 (.47)</td>
<td>0.77 (.34)</td>
</tr>
<tr>
<td>Cognitive Methods</td>
<td>2.45 (.79)</td>
<td>2.33 (.93)</td>
<td>2.14 (.95)</td>
</tr>
<tr>
<td>Negotiating/Structuring</td>
<td>2.86 (.58)</td>
<td>2.67 (.53)</td>
<td>2.48 (.43)</td>
</tr>
<tr>
<td>Patient Facilitation</td>
<td>4.82 (.74)</td>
<td>4.41 (.88)</td>
<td>4.66 (.89)</td>
</tr>
<tr>
<td>Facilitative Conditions</td>
<td>4.79 (.47)</td>
<td>4.63 (.61)</td>
<td>4.55 (.37)</td>
</tr>
<tr>
<td></td>
<td>Control vs. Pre-gain Session</td>
<td>Control vs. Post-gain Session</td>
<td>Pre-gain vs. Post-gain Session</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------</td>
<td>------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>d</td>
<td>t</td>
</tr>
<tr>
<td>Behavioral Methods/</td>
<td>1.79†</td>
<td>.88</td>
<td>3.04*</td>
</tr>
<tr>
<td>Homework</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Methods</td>
<td>.54</td>
<td>.26</td>
<td>1.46</td>
</tr>
<tr>
<td>Negotiating / Structuring</td>
<td>2.21*</td>
<td>1.07</td>
<td>2.46*</td>
</tr>
</tbody>
</table>

*Table 4. Adherence factors changing as a function of session type. n = 19
*p < .05. † < .10.
Appendix B: Figures
Figure 1. Temporal sequence of sudden gains.
Figure 2. Study enrollment for the current sample

Assessed for eligibility ($N = 86$)

Excluded ($n = 19$)
- Bipolar I Disorder ($n = 2$)
- Psychotic disorder ($n = 1$)
- Current substance dependence ($n = 1$)
- No current Major Depressive Disorder ($n = 13$)
- Primary diagnosis other than MDD ($n = 2$)

Met inclusion criteria and enrolled in treatment ($n = 67$)

Removed from current study ($n = 26$)
- $> 8$ sessions ($n = 21$)
- BDI at session 1 $< 15$ ($n = 5$)

Available subject pool ($n = 41$)
Figure 3. Repeated measures ANOVA looking at the difference in Cognitive Change scores by session type (control, pre-gain, post-gain).

$n = 19$

*p < .05*
Figure 4. Repeated measures ANOVA looking at the interaction of Axis II diagnosis with Cognitive Change scores by session type (control, pre-gain, post-gain).

$n = 19$ (Axis II Diagnosis $n = 6$)
Figure 5. Repeated measures ANOVA looking at the interaction of sex with alliance scores by session type (control, pre-gain, post-gain).

$n = 19$ (female $n = 12$)
Figure 6. Repeated measures ANOVA looking at the difference in adherence variables by session type (control, pre-gain, post-gain).

\( n = 19 \)

\(*p < .05. \dagger < .10.\)