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Non-treatment-related sudden gains in depression: The role of self-evaluation

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Received 8 December 2005; received in revised form 13 April 2006; accepted 15 June 2006

Abstract

A number of studies have demonstrated that recovery from depression is often marked by precipitous improvements during the course of treatment. The present research examined sudden gains occurring outside of the context of treatment in a sample of college students with current major depressive disorder ($n = 60$), and tested whether variables pertaining to cognitive style, hope, self-evaluation, and life events would be associated with these gains. Results indicated that 60% of the sample experienced sudden gains, with over half of those sudden gains reversing before the end of the 9-week observation period. Sudden gainers were significantly less depressed at the end of the observation period but were no more likely to have achieved remission compared to non-sudden gainers. Although changes in cognitive style did not precede sudden gains, individuals with sudden gains had significantly higher self-esteem at baseline compared to non-sudden gainers. Furthermore, decreases in the frequency of social comparison occurred in the week prior to sudden gains. These results suggest that sudden gains do occur outside of the context of treatment and that self-evaluation processes may play an important role in recovery from depression.
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Keywords: Depression; Natural course; Sudden gains; Self-evaluation; Self-esteem; Social comparison; Spontaneous remission; Cognitive style

Introduction

Researchers have noted that a number of individuals in psychotherapy for depression have precipitous improvements in their depressive symptomatology from one session to the next. Since Tang and DeRubeis (1999) identified "sudden gains" among patients in cognitive therapy for depression, researchers have been increasingly interested in the occurrence and meaning of these precipitous improvements in symptomatology. This work has resulted in the identification of sudden gains in a variety of treatment modalities and among different populations. These include psychodynamic treatment of adult depression (Tang, Luborsky, & Andrusyna, 2002), community-based "treatment as usual" for adults (Stiles et al., 2003), psychoeducational group treatment for adult depression (Kelly, Roberts, & Ciesla, 2005) and a variety of treatment modalities for

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adolescent depression (Gaynor et al., 2003). Importantly, sudden gains often represent lasting changes in depressive symptom severity as opposed to random fluctuations (Kelly et al., 2005; Tang & DeRubeis, 1999). Although sudden gains have been documented across a variety of treatment modalities, to date no research has examined whether the natural course of depression is also marked by these rapid improvements in symptomatology.

In both their original work and a recent replication, Tang and colleagues found that individuals who experienced a sudden gain in a given session had marked improvements in the adaptive quality of their cognitions in the previous session (Tang & DeRubeis, 1999; Tang, DeRubeis, Beberman, & Pham, 2005). However, other researchers have not consistently found a relationship between improvements in cognitive style and sudden gains (see Busch, Kanter, Landes, & Kohlenberg, 2006; Gaynor et al., 2003; Kelly et al., 2005). These inconsistencies suggest the need for further research and raise the possibility that a broader assessment of variables might capture the relevant processes involved in triggering sudden gains.

Although dysfunctional attitudes and self-esteem have been widely investigated in the onset and maintenance of depression, hope and self-efficacy might also be important to consider as triggers of sudden gains in depression. Some researchers have argued that individuals who are able to maintain a certain level of hope in the face of depression have a better chance of recovering from depressive episodes (Scheier & Carver, 1985; Scheier, Carver, & Bridges, 1994; Snyder, Ilardi, Michael, & Cheavens, 2000). In addition, Abramson, Metalsky, and Alloy (1989) propose a subtype of depression characterized by hopelessness and pessimism about the future. It is likely that more hopeful individuals view even small improvements as compelling evidence for recovery, feeding into a positive cycle that may in fact help to alleviate symptoms. Thus depressed individuals with initially higher levels of hope or improvements in hope may be more likely to experience sudden gains in depressive symptoms.

Likewise, self-efficacy to control mood (SECM) (i.e., belief in one's ability to improve mood) may contribute to sudden gains. Muris and colleagues found that general self-efficacy (Muris, 2002; Muris, Schmidt, Lambrichs, & Meesters, 2001) and emotional self-efficacy (Muris, 2002) were related to depression scores among adolescents (see also Kirsch, Mearns, & Catanzaro, 1990). Further, several researchers have found evidence that greater initial levels of self-efficacy are related to lower levels of depressive symptoms at follow-up in both adult (Kavanagh & Wilson, 1989; Maciejewski, Prigerson, & Mazure, 2000; Usaf & Kavanagh, 1990) and young adult populations (Saltzman & Holahan, 2002), and that individuals who expect to be able to control their mood (high mood self-efficacy) are less dysphoric and use more adaptive coping methods when faced with stressful life situations (Kavanagh & Wilson, 1989; Maciejewski et al., 2000; Saltzman & Holahan, 2002; Usaf & Kavanagh, 1990). This past work raises the possibility that changes in SECM will precede sudden gains.

Another potential catalyst for sudden gains is the use of social comparisons. Social comparison processes have been shown to both improve and exacerbate dysphoric mood, depending on both the context and the type of comparisons made (see Lockwood & Kunda, 1997; Wheeler & Miyake, 1992). Further, Swallow and Kuiper (1992, 1993) have demonstrated that dysphoric individuals' use of social comparison may be damaging, maintaining their negative moods. To date no research has examined the role of social comparison in triggering sudden gains in depression. Finally, life events may be associated with either the maintenance of depression (in the case of negative events) or with rapid improvement in depressive symptoms (in the case of positive events). "Fresh start" events involving the resolution of ongoing negative situations have been associated with remission from depression (Brown, Adler, & Bifulco, 1988; Harris, Brown, & Robinson, 1999), and the occurrence of positive life events has been linked to recovery from depression (Leenstra, Ormel, & Giel, 1995). These findings suggest that the occurrence of life events, especially positive ones, may be involved in triggering sudden gains.

The present study has two main objectives. First, we sought to examine the basic presumption that psychological treatment is necessary in the generation of sudden gains and determine if sudden gains occur in a non-treated sample at rates similar to those found among treated samples. Previous research has presumed that sudden gains are related to the provision of treatment and that these gains are triggered by factors inherent to treatment. In contrast, researchers have long observed that recovery occurs with a relatively high frequency among placebo or wait-list-control group patients during the course of clinical trials (see Posternak & Miller, 2001 for a meta analysis). Thus it is possible that sudden gains, although reflective of genuine and

enduring improvements in depressive symptoms, are simply part of the natural course of unipolar depression and occur irrespective of treatment. Second, we tested whether self-esteem, dysfunctional attitudes, hope and hopelessness, SECM, social comparison processes and life events would be associated with sudden gains.

Method

Participants

Participants were recruited from introductory psychology classes at the University at Buffalo and received both financial compensation and class credit for their participation. Potential participants completed the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) during mass testing procedures at the beginning of the fall and spring semesters of the 2004–2005 academic year. Individuals scoring a 15 or above on the BDI-II were invited to the lab for further assessment. Potential participants were interviewed using the Mood Module of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-M; First, Spitzer, Gibbon, & Williams, 1997). Individuals who met criteria for current Major Depressive Disorder (MDD), had elevated scores (15 or above) on the BDI-II and were not receiving treatment for depression were invited to complete weekly on-line questionnaires for a total of 9 weeks. Of the 190 individuals interviewed, 65 met our criteria and were invited to participate in the study. Of those, three began treatment for depression during the study and two were lost to follow-up leaving a final sample of 60 non-treated undergraduate students with current MDD. Of these, 43.3% were male and the average age was 19.1 years ($SD = 2.41$, range: 18–32 years). Two thirds of the sample ($n = 40$) was Caucasian. Average scores on the BDI-II at the time of interview was 25.2 ($SD = 6.93$). The majority of participants were in their first Major Depressive Episode ($n = 35$, 58.3%) and the average length of the current episode was 32.9 weeks ($SD = 57.8$; median $= 7$ weeks; mode $= 4$ weeks). Average age of onset for depression was 17 years ($SD = 3.53$).

Measures

Assessment of depression

To determine current depressive status, we used the Mood Module of the SCID (First et al., 1997). The SCID is a widely used semi-structured interview designed as a diagnostic tool for the Diagnostic and Statistical Manual for Psychiatric Disorders (American Psychiatric Association, 2001). Diagnostic interviews were conducted by two of the authors (M.K. and K.B.) both of whom had been trained in appropriate use of the SCID. Time-1 paired-rater reliabilities based on a random subset of 25% of the full sample interviewed ($n = 190$) were quite good for current (non-remitted) MDD ($\kappa = 0.86$, $n = 48$). Depressive symptom severity was assessed using the BDI-II (Beck et al., 1996). The BDI-II is a well-validated self-report measure of depressive symptomatology, consisting of 21 items rated from 0 to 3. It has been shown to have strong psychometric properties ($\alpha = 0.92$; Beck et al., 1996). In the present study, coefficient alpha averaged across study weeks was 0.90.

Measures of factors potentially impacting sudden gains

Abbreviated versions of the Dysfunctional Attitudes Scale (DAS; Weissman, 1980), the Rosenberg Self-esteem Scale (RSE; Rosenberg, 1979), the Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974), and the Life Orientation Test (LOT; Scheier & Carver, 1985) were used. The 40-item DAS is a measure designed to assess the negative schemas hypothesized to predispose individuals to depression. Oliver and Baumgart (1985) found the DAS to have good internal consistency (coefficient alpha $= 0.85$). The RSE is a 10-item measure of global self-esteem that has shown good psychometric properties (Rosenberg, 1979). The BHS is a 20-item measure of hopelessness, a characteristic believed to be central to depression. It is widely used and has been found to be internally consistent (coefficient alpha $= 0.93$) and to have strong convergence with clinician ratings of hopelessness (Beck et al., 1974). The LOT is a 12-item measure designed to measure optimism about the future. It has shown good convergent and discriminant validity (Scheier et al., 1994). To reduce participant burden, extant factor analyses of the above measures were used to select items that accounted for the most variance in each overall measure (Aish & Wasserman, 2001; Cane, Olinger, Gotlib, &

Kuiper, 1986; O'Brien, 1985; Scheier et al., 1994). For each scale, four items were retained. Items were rephrased into the past tense to remind participants to think about the past week when answering questions. Coefficient alphas in the present sample ranged from 0.74 to 0.76 averaged across study weeks for each of these abbreviated measures.

To assess SECM, we modeled a measure after the work of Bandura, particularly his measures used to evaluate self-efficacy among phobic participants (Bandura, 1977; Bandura, Adams, & Beyer, 1977). Because we were interested in the impact of self-efficacy on mood in the following week, we asked participants to evaluate how confident they were that they would be able to control or change their mood and how confident they were that they could cope with a stressful situation in the following week. Participants were asked to rate their degree of confidence on an 11-point percentage scale with 0% and 100% confident as anchors. Because the three items used to measure self-efficacy were moderately correlated in our sample (average r's across study weeks > 0.62) and were intended to assess the same construct, a mean score was formed to represent participants' self-efficacy each week. Mean weekly coefficient alpha was 0.87.

We examined the impact of life events on sudden gains in the present sample using the Life Events and Difficulties Schedule (LEDS; Brown & Harris, 1978). The LEDS is widely accepted as the most reliable and objective method for evaluating the occurrence and impact of life events among depressed individuals. The LEDS consists of an interview that probes for life events in a variety of areas such as school, work, social and family life. A consensus threat rating is arrived at based on the interviewer's presentation of events to the consensus team. Inter-rater agreement analyses applied to other LEDS data collected in our laboratory (Bottonari, Roberts, Kelly, Kashdan, & Ciesla, in press) indicated good agreement among multiple raters regarding event severity (Light's $\kappa = 0.85$; see Conger, 1980). Life events occurring during the observation period were matched as closely as possible to the study week in which they occurred based on participant's recall of the date of the event.

Social comparison was examined with three items based on a measure developed by Wheeler and Miyake (1992) with good split-half reliability ($r = 0.74$). We simplified their daily measure by asking how many times participants had compared themselves to others in general (Overall), to superior others (Upward), and to inferior others (Downward) over the course of the week. Participants responded to these three items using a 7-point Likert scale.

Procedure

Participants who met inclusion criteria completed a set of questionnaires at baseline and were asked to complete an identical series of questions weekly for an additional 8 weeks. The weekly questionnaires included the BDI-II (Beck et al., 1996), selected items from the BHS (Beck et al., 1974), the LOT (Scheier & Carver, 1985), the RSE (Rosenberg, 1965), the DAS (Weissman, 1980), and measures of social comparison and SECM. Participants were asked to complete these weekly questionnaires on the same day as their initial interview between the hours of 3 and 9 PM. Data collection was done electronically using an on-line survey program (S-Ware, 1997). Participants received a weekly e-mail the day before their questionnaire was due providing them with a link to the on-line survey web-site and reminding them to complete their questionnaire on the appropriate day and time. Participants not completing a weekly questionnaire on time were reminded via e-mail and/or phone to do so promptly. Data were identified using the participant's assigned subject number and automatically marked with the date and time of completion.

At the end of the semester, participants were re-interviewed using the SCID-M to assess the presence of depressive symptoms in the last 2 weeks of study participation. LEDS interviews were also conducted at the final interview. Participants earned research credits for the initial interview and for completing weekly surveys and were paid $10 for the final interview. Participants provided informed consent, were fully debriefed at the end of the study, and were provided with referrals for treatment of depression.

Data analysis

Individuals with sudden, week-to-week improvements in depressive symptomatology during the study were identified to examine the characteristics of the weeks preceding these "sudden gains". The presence of a

sudden gain was determined using criteria similar to those used in previous studies (Tang & DeRubeis, 1999; Kelly et al., 2005). Specifically, an improvement in symptoms was considered to be a sudden gain if it represented: (1) a 25% reduction in BDI-II score from 1 week to the next; (2) at least a 7-point reduction from 1 week to the next; and (3) at least a 1.5 standard deviation difference from the individual's mean score over the course of the study. These criteria are intended to ensure that sudden gains are large and unlikely to be due to normal variation in scores for an individual. A sudden gain is considered to have reversed if any subsequent BDI-II score returned to a level that reflected giving up 50% of the sudden gain. For example, a participant whose sudden gain reflected a decrease in BDI-II from 30 points to 20 would be considered to have had a reversal if she recorded a BDI-II of 25 in any subsequent week.

It is important to note that the third criterion used in this study differs from that used by Tang and DeRubeis (1999). In their original work, Tang and DeRubeis compared the means of the three BDI scores preceding and following a large improvement using an independent sample t-test with $\alpha = 0.05$. Although others have continued to use this or a similar criterion (Tang et al., 2002; Hardy et al., 2005; Vittengl, Clark, & Jarrett, 2005), it has also come under criticism for several reasons. First, Tang and DeRubeis' method violates the assumption of independence (because the two samples are drawn from the same participant) and does not account for autocorrelation between scores (see Vittengl et al., 2005). An additional complication is that, in cases where only two sessions were available prior to or following the gain, this reduction in degrees of freedom is not always accounted for (see Tang et al., 2005). From a practical standpoint, Tang and DeRubeis' original third criterion makes it impossible to assess large improvements that occur either very early or very late in treatment, because it requires two–three sessions prior to or after the gain. This substantially reduces the number of potential sudden gains that can be assessed in brief treatments of depression. Lastly, this criterion has not been applied consistently in the extant literature. Although several studies use the t-test for this criterion (Tang et al., 2002; Vittengl et al., 2005; See Hardy et al., 2005, for another adaptation), Tang and colleagues shift to a slightly different criterion in their recent work (Tang et al., 2005). In place of the t-test with a critical value of 2.78 (for 4 df and $\alpha = 0.05$), they require that the mean difference between the pre- and post-gain scores exceed 2.78 times the pooled SD of the two groups. Although Tang and colleagues indicate that this is equivalent to the t-test, it is statistically different and can produce different results.

Given these concerns, we altered this third criterion in both the present study and in our previous work (Kelly et al., 2005) by requiring that a potential sudden gain be greater than or equal to 1.5 times the individual's standard deviation across all time points. This alternate criterion insures that the size of the gain exceeds the individual's typical shifts in symptoms. Thus our third criterion adheres to the intent of the original criterion by screening out individuals with typically large shifts in depressive symptoms, while easing statistical and practical complications associated with Tang and colleagues' third criteria.

Participants with sudden gains were compared to those without sudden gains on initial depressive symptom severity, initial cognitive style, terminal depressive severity, and remission status. In addition, differences in cognitive style and use of social comparison were compared between weeks that preceded sudden gains and weeks that did not. Scores from the pre-gain session were compared with scores with the session before that (the pre-pre-gain session) as a control week to test the hypotheses that weeks preceding significant symptom improvement should be marked by positive cognitions and more adaptive use of social comparison compared to other weeks. Paired sample t-tests and χ^2 analyses were used to determine if there were significant differences between pre-gain sessions and pre-pre-gain sessions on the variables of interest.

Results

Preliminary analyses

Protocol adherence

Our final sample of 60 individuals ideally would have produced 540 weekly assessments. Weekly assessments were considered to be valid if they were completed within 3 days of the scheduled due date. Approximately 98% (527) of all weekly assessments were valid and the vast majority (76.1%) of all assessments were completed on their scheduled due date.

Demographics

As previously stated, 26 males and 34 females were included in the study. To determine if demographic characteristics were related to any of our weekly measures, independent *t*-tests were conducted contrasting various demographic subgroups on a week-to-week basis. There was no consistent pattern of differences on any of our weekly measures based on gender, ethnicity (Caucasian vs. non-Caucasian) or study cohort (fall vs. spring semester) across study weeks.

Clinical outcome

We considered participants to be in remission at the final assessment if they showed a 50% reduction in their BDI scores over the observation period and if they did not meet criteria for MDD during the last 2 weeks of the study according to the SCID-M. Twelve of the 60 participants (20%) met these criteria.

Frequency of sudden gains and association with outcome

Using the criteria outlined above, we identified 46 sudden gains occurring to 36 individuals. This represents 60% of the total sample. The average size of a sudden gain was 12.5 BDI points ($SD = 4.5$). This is comparable to previous studies, where average magnitude ranges from 10.2 (Tang et al., 2005) to 13.2 points (Hardy et al., 2005). Twenty-five of 46 sudden gains reversed (54.3%), indicating that sudden gains were not sustained for 23 of the sudden gainers.

Those who experienced sudden gains did not differ from non-sudden gainers on initial BDI-II score, 24.1 vs. 26.8, $t(58) = 1.51$, $p = 0.14$. However, sudden gainers had significantly lower BDI-II scores at the end of the observation period, 17.64 vs. 26.96, $t(58) = 2.51$, $p < 0.05$. This finding held when initial depressive severity was controlled, $F(1, 60) = 5.07$, $p < 0.05$. In contrast, individuals who had sudden gains were no more likely to be in remission at the end of the observation period, $\chi^2(1, N = 60) = 0.28$, $p = 0.60$ (22.2% within sudden gainers, 16.7% within non-sudden gainers). See Table 1 for comparisons between sudden gainers and non-sudden gainers on additional variables of interest and Table 2 for baseline scores and correlations.

Predictors of sudden gains

Several potential predictors of sudden gain status were examined to determine the impact of initial scores of our predictor variables on the presence or absence of sudden gains. Because we hypothesized that sudden gains would be preceded by more positive cognitions and attitudes, we used one-tailed significance tests in each of

Table 1
Initial characteristics of sudden gainers and non-sudden gainers

	Sudden gainers		Non-sudden gainers		*t*-value
	M	*SD*	*M*	*SD*	
RSE	7.64	2.66	6.12	3.10	2.02[a,b]
DAS	9.11	2.67	9.79	3.09	0.91
LOT	5.83	3.04	4.42	2.38	1.92[a,b]
BHS	8.08	3.19	8.92	2.62	1.06
SECM	40.56	14.04	34.17	18.18	1.53[a,c]
Overall SC	3.33	2.20	4.33	2.01	1.78[d]
Upward SC	0.72	3.65	2.17	2.66	1.67[b,d]
Downward SC	0.19	3.54	0.50	2.28	0.37[d]

Note: Total $n = 60$, $df = 58$. RSE = Rosenberg Self Esteem; DAS = Dysfunctional Attitudes Scale; LOT = Life Orientation Test; BHS = Beck Hopelessness Scale; SECM = Self-efficacy to Control Mood; SC = Social Comparison Mood.
The RSE, DAS, LOT and BHS represent abbreviated versions of the original questionnaires.

[a]One tailed test.
[b]$p < 0.05$.
[c]$p < 0.10$.
[d]Two-tailed test.

Table 2
Week 1 correlations

		M	SD	2	3	4	5	6	7	8	9	10
1.	Overall SC	3.73	2.17	0.70[a]	0.48[a]	0.00	−0.32[b]	0.06	0.33[b]	−0.08	−0.46[a]	0.37[c]
2.	Upward SC	2.05	1.32	–	0.12	0.04	−0.21	0.04	0.34[d]	−0.03	−0.38[c]	0.22
3.	Downward SC	1.07	1.26		–	−0.01	−0.22	0.18	0.07	0.05	−0.11	0.13
4.	Consensus threat	0.13	0.54			–	0.25	−0.26[b]	0.02	0.04	0.14	−0.10
5.	LOT	5.27	2.86				–	−0.67[a]	−0.20	0.35[d]	0.58[a]	−0.51[a]
6.	BHS	8.42	2.98					–	0.22	−0.35[d]	−0.52[a]	0.34[d]
7.	DAS	9.38	2.84						–	−0.25	−0.45[a]	0.41[c]
8.	SECM	38.00	15.99							–	0.38[c]	−0.45[a]
9.	RSE	7.03	2.92								–	−0.70[a]
10.	BDI-II	25.17	6.93									–

Note: SC = Social Comparison; LOT = Life Orientation Test; BHS = Beck Hopelessness Scale; DAS = Dysfunctional Attitudes Test; SECM = Self-Efficacy to Control Mood; RSE = Rosenberg Self-Esteem; BDI-II = Beck Depression Inventory.
The RSE, DAS, LOT and BHS represent abbreviated versions of the original questionnaires.
[a] $p < 0.001$.
[b] $p < 0.05$.
[c] $p < 0.005$.
[d] $p < 0.01$.

the following analyses. Sudden gainers did not differ on initial levels of hopelessness, $t(58) = 1.06$, or dysfunctional attitudes, $t(58) = 0.91$, all p's > 0.14. However, sudden gainers did have significantly higher initial self-esteem, $t(58) = 2.02$, and hope, $t(58) = 1.92$, p's < 0.05, compared to non-sudden gainers. Further, there was a marginal trend for sudden gainers to have higher initial levels of SECM, $t(58) = 1.53$, $p < 0.07$. However, when initial BDI-II was controlled, only the association between sudden gain status and self-esteem remained significant, $F(1, 60) = 2.95$, $p < 0.05$, whereas the between group differences in initial hope, $F(1, 60) = 1.74$, $p = 0.10$, and initial self-efficacy, $F(1, 60) = 0.91$, $p = 0.17$, were not significant. To test whether self-esteem might be predictive of general recovery as opposed to being specific to sudden gains, we conducted a one-tailed independent sample t-test comparing initial RSE scores between those who had recovered ($n = 12$) and those who had not ($n = 48$). This test was not significant, $t(58) = 1.29$, $p = 0.10$.

We next sought to determine if relative improvements in hope, hopelessness, dysfunctional attitudes, self-esteem or SECM were associated with sudden gains. As indicated above, scores on these measures from weeks immediately preceding a sudden gain week were compared to scores from a control week using one-tailed paired sample t-tests. The measurement occurring 2 weeks prior to the sudden gain week (a week not associated with the sudden gain but still temporally close to the sudden gain week) was systematically used as the control week. Because some participants had more than one sudden gain during the observation period, the first usable sudden gain (the first one for which there were data in the preceding 2 weeks) was included in these analyses. This procedure is consistent with what has been done in previous studies (see Tang & DeRubeis, 1999; Tang et al., 2005). Contrary to hypotheses, levels of hope, hopelessness, dysfunctional attitudes, self-esteem and SECM in the week just prior to a sudden gain did not significantly differ from measurements of these variables in control weeks, all t's < 1.39, all p's > 0.09. Thus changes in these variables did not predict sudden gains in the following week in this sample.

Next, the impact of Upward, Downward and Overall social comparisons was examined. Because we did not have specific directional hypotheses, two-tailed significance tests were used in these analyses. As stated above, Upward Social Comparisons reflect comparisons to others who are perceived of as better off than the comparer, while Downward Social Comparisons reflect comparisons of the self to those perceived of as being worse off. As above, paired sample t-tests were conducted comparing rates of upward, downward and overall social comparison in the week just prior to a sudden gain compared to the control week. Although changes in the rates of Upward and Downward Social Comparison were not significantly associated with sudden gains, t's < 1.57, p's > 0.12, decreases in Overall Social Comparison predicted sudden gains in the following week, $t(33) = 2.08$, $p < 0.05$.

Regarding life events, neither "fresh start" (the resolution of an ongoing negative situation) nor negative events were associated with sudden gains. Of the six fresh start events that occurred to sudden gainers, three occurred in the week prior to a sudden gain, two occurred in the week of a sudden gain and only one occurred in a control week. Despite this, fresh start events did not occur significantly more often in the sudden gain or preceding week when pooled and compared to control weeks, χ^2 (1, $n = 34$) = 1.93, $p = 0.16$. Further, the presence of a negative life event in the sudden gain week or preceding week were not associated with sudden gains when compared to the control week, χ^2 (1, $n = 34$) = 0.09, $p = 0.77$. Similarly, cumulative threat ratings were not associated with the occurrence of sudden gains in the present analyses, $t(33) = 1.53$, $p = 0.14$.

Given the frequency of reversals associated with sudden gains in the present data set, we sought to determine if any of the above variables differed for those with sustained sudden gains ($n = 13$) compared to those whose sudden gains that reversed ($n = 23$). Those with sustained sudden gains were not more likely to have achieved remission from their depression by the end of the study period, χ^2 (1, $n = 36$) = 0.86, $p = 0.35$ (30.8% of sustained sudden gainers, 13.0% of reversers), and did not differ significantly in terms of their final BDI-II score compared to those whose sudden gains had reversed, $t(34) = 1.73$, $p = 0.09$, two-tailed (sustained: 14.02, reversed: 19.68). Participants with sustained sudden gains did not differ from participants with reversed sudden gains on initial BDI-II, RSE, DAS, BHS, LOT or SECM, all t's <0.97, p's >0.16, one-tailed. Within-group paired sample t-tests were conducted comparing pre-gain and control weeks in terms of social comparison, positive and negative life events, RSE, DAS, BHS, LOT and SECM within sustained sudden gainers and reversers. Examination of these analyses did not reveal differing patterns based on durability of sudden gains. Thus, none of these predictors was more closely associated with sustained sudden gains compared to sudden gains that were reversed.

Discussion

The present study sought to determine rates of sudden gains in a non-treated depressed sample and to explore factors associated with those gains. Clinically depressed undergraduates provided weekly assessments of depressive symptoms, negative thinking style, self-evaluation and the use of social comparison over a 9-week period. Sudden gains were determined using previously established criteria (Kelly et al., 2005; Tang & DeRubeis, 1999). Given rates reported in previous treatment studies, we expected that approximately 40% of the sample would have a sudden gain. We also hypothesized that sudden gains would be preceded by improvements in cognitive style, attitudes, life events and differential use of social comparison.

Sudden gains have been found to be a reliable occurrence in psychotherapy research (Hardy et al., 2005; Kelly et al., 2005; Stiles et al., 2003; Tang & DeRubeis, 1999; Tang et al., 2002, 2005; Vittengl et al., 2005). The present study found that they also frequently occur among untreated depressed individuals. In fact, rates of sudden gains occurring in the present non-treated sample were somewhat higher than rates found in our treated sample, which used identical criteria (60% vs. 41.9%; Kelly et al., 2005), and was similar to rates found in other studies using slightly different criteria (approximately 40%; Hardy et al., 2005; Kelly et al., 2005; Stiles et al., 2003; Tang & DeRubeis, 1999; Tang et al., 2002, 2005; Vittengl et al., 2005). This is particularly striking given that the present study was based on a relatively brief time period of 9 weeks. As previous sudden gains research has relied on treatment periods lasting up to 20 weeks, it seems likely that we would have obtained an even higher rate of sudden gains with a longer observation period.

Although sudden gains were common in the context of this non-treated sample, these gains appear to be less durable than those that occur in the context of treatment. Specifically, reversals of gains were common in the present sample (54.3%). This rate is consistent with our previous work (53.8%; Kelly et al., 2005) but somewhat higher than rates found in other samples (17-40%; Hardy et al., 2005; Stiles et al., 2003; Tang & DeRubeis, 1999; Tang et al., 2002, 2005; Vittengl et al., 2005). Given our relatively brief observation period, longer periods might have revealed an even higher reversal rate. Our findings suggest that sudden gains may be part of the natural course of depression for some patients and that they occur irrespective of treatment. Further, it is possible that psychological treatments are effective in part to the extent that they help clients stabilize and maintain sudden gains when they occur. In other words, the therapeutic work that goes on after a major improvement in symptomatology may be even more important than what takes place beforehand.

Future research concerning how treatments can capitalize on sudden gains for lasting improvement appears to be warranted.

Although sudden gainers did not differ from non-sudden gaining participants in terms of initial level of depressive severity, sudden gainers enjoyed significantly lower levels of depressive severity by the end of the observation period. It has been suggested that the comparison of end-point depression scores for sudden and non-sudden gainers represents a tautology in that it compares individuals known to have improved significantly over time with those who have not had large interval gains. However, the lack of a sudden gain does not preclude participants from making significant but steadier improvements over the course of time. In addition, as was found in the present sample, sudden gains are often reversed, decreasing the likelihood that sudden gainers would be significantly less symptomatic at the end of treatment or observation. Thus, given the consistent finding that those with sudden gains fair better by the end of treatment or observation, sudden gains appear to be an important and robust factor in depressive symptom improvement.

The present study attempted to identify factors that contribute to sudden gains. In previous research (Tang & DeRubeis, 1999), sudden gains were temporally preceded by improvements in cognitive style as coded from recordings of individual sessions of cognitive therapy. The authors concluded that changes in cognitive style precipitated sudden gains. Since that seminal article, however, sudden gains have been found to occur reliably in non-cognitively oriented treatments (Tang et al., 2002) and among patients during the assessment phase prior to formal treatment for depression (Kelly et al., 2003; Busch et al., 2006). Further, our own attempts to replicate Tang's finding that cognitive improvements precede sudden gains was not fruitful when cognitive style was examined through self-report measures (Kelly et al., 2005).

Consistent with our previous study based on a clinically depressed sample receiving treatment, the present data suggest that cognitive style does not differ in weeks that immediately precede sudden gains when compared to control weeks. In other words, changes in cognitive style did not temporally precede sudden gains, nor did changes in levels of hope or self-esteem. However, it is important to note that our research (including our previous study) has focused on weekly measures of these factors, and it is therefore possible that more proximal changes are crucial in triggering sudden gains. On the other hand, our results suggest that higher levels of baseline self-esteem prospectively predict who will have a sudden gain even when initial level of depressive severity is accounted for. This result suggests that person-level factors exist that predispose some to sudden gains. Perhaps relatively high self-esteem can be capitalized on in treatment to promote rapid improvements in depressive symptoms. Further research focusing on positive characteristics of depressed individuals may help to illuminate this relationship further.

The present data did indicate that participants engaged in less social comparison in the week just prior to a sudden gain week when compared to a control week. This finding suggests that frequent social comparisons may serve to maintain depressive symptoms among clinically depressed individuals, whereas decreases may facilitate improvement. Consistent with our findings, a number of studies by Swallow and Kuiper suggest that frequent social comparisons maintain dysphoric mood (Swallow & Kuiper, 1992) and that some dysphoric individuals may avoid social comparison as a form of self-protection (Swallow & Kuiper, 1990). Frequent social comparisons are likely reflections of self-evaluation concerns. Indeed, frequency of social comparisons was negatively correlated with self-esteem in our sample at Week 1 (see Table 2). Perhaps depressed individuals who frequently examine how they stand up to others are either unsure of their self-worth or are attempting to improve their self-esteem. Our data suggest that these efforts are not successful and that they are associated with the maintenance of depressive symptoms; depressed individuals appear to be less likely to experience sudden gains during periods while they are repeatedly evaluating themselves against others. In contrast, rapid improvement in symptomatology appears more likely once depressed individuals let go of these self-evaluative concerns (see Hayes et al., 1999). To our knowledge, this is the first study to either examine social comparison in a clinically depressed sample or to investigate social comparison as a predictor of recovery from depression. As such, these results are best viewed as interesting but preliminary and in need of replication.

It is also important to discuss the level of change that might be expected in the variables currently examined, given that this was a non-treated sample. Theoretically, we might not expect either sudden gains or improvements in cognitive style, hope and self-evaluation in the absence of treatment. However, because sudden gains appear to occur across treatment modalities, it seems important to determine the degree to which these changes are associated with treatment or if they are naturally occurring. In addition, although there is

good evidence that depressotypic thinking patterns remit with the depression, there is mixed evidence regarding the causal direction of the association between changes in mood and changes in thinking. Although this debate is beyond the scope of the present paper, it seems plausible to expect some degree of change in the variables examined here despite the lack of intervention.

In closing, it is important to address a number of limitations in the present study. First, the average age in the present sample was about 19 years. Thus our sample was at the end of their adolescence and, as such, may have been subject to more variable mood associated with relative developmental immaturity. Further, given the average age of our sample, these participants for the most part were suffering from early-onset depression. As such, our participants may differ from those who first experience depression later in life. Second, the typical depressive episode was short in duration (median = 7 weeks) at initial assessment. Further, the present sample represents a fairly homogenous group comprised largely of single young adults with both the means and opportunity to begin higher education. Lastly, although our sample size is moderate in terms of clinical research, some of the null findings presented might reflect sample size rather than true non-differences. Future research with larger and more representative samples are warranted. For example, investigation of sudden gains among wait-list control participants in randomized control studies might be particularly informative. Overall, our results suggest that researchers seeking to explain sudden gains may be well served to consider factors that occur outside of treatment as potential catalysts of change.

Acknowledgements

References

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory based subtype of depression. *Psychological Review*, *96*, 358–372.

Aish, A., & Wasserman, D. (2001). Does Beck's hopelessness scale really measure several components? *Psychological Medicine*, *31*, 367–372.

American Psychiatric Association. (2001). *Diagnostic and statistical manual*, fourth edition, text revision. Washington, DC: APA.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191–215.

Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Personality and Social Psychology*, *35*, 125–139.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck depression inventory manual* (2nd ed.). San Antonio, TX: Psychological Association.

Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The Hopelessness Scale. *Journal of Consulting and Clinical Psychology*, *42*, 861–865.

Bottonari, K. A., Roberts, J. E., Kelly, M. A. R., Kashdan, T. B., & Ciesla, J. A. (in press). A prospective investigation of the impact of attachment style on stress generation among clinically depressed individuals. *Behaviour Research and Therapy*, doi:10.1016/j.brat.2006.01.003.

Brown, G. W., Adler, Z., & Bifulco, A. (1988). Life events, difficulties, and recovery from chronic depression. *British Journal of Psychiatry*, *152*, 487–498.

Brown, G. W., & Harris, T. O. (1978). *Social origins of depression: A study of psychiatric disorder in women*. London: Tavistock.

Busch, A. M., Kanter, J. W., Landes, S. J., & Kohlenberg, R. J. (2006). Sudden gains and outcome: A broader temporal analysis of cognitive therapy for depression. *Behavior Therapy*, *37*, 61–68.

Cane, D. B., Olinger, L. J., Gotlib, I. H., & Kuiper, N. A. (1986). Factor structure of the dysfunctional attitudes scale in a student population. *Journal of Clinical Psychology*, *42*, 307–309.

Conger, A. J. (1980). Integration and generalisation of Kappas for multiple raters. *Psychological Bulletin*, *88*, 322–328.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1997). *Structured Clinical Interview for DSM-IV Axis I Disorders—Patient Edition (SCID)*. New York: Biometrics Research Department.

Gaynor, S. T., Weersling, V. R., Kolko, D. J., Birmaher, B., Heo, J., & Brent, D. A. (2003). The prevalence and impact of large sudden improvements during adolescent therapy for depression: A comparison across cognitive-behavioral, family and supportive therapy. *Journal of Consulting and Clinical Psychology*, *71*, 386–393.

Hardy, G. E., Cahill, J., Stiles, W. B., Ispan, C., Macaskill, N., & Barkham, M. (2005). Sudden gains in cognitive therapy for depression: A replication and extension. *Journal of Consulting and Clinical Psychology*, *73*, 59–67.

Harris, T., Brown, G. W., & Robinson, R. (1999). Befriending as an intervention for chronic depression among women in an inner city: 2: Role of fresh-start experiences and baseline psychosocial factors in remission from depression. *British Journal of Psychiatry*, *174*, 225–232.

Hayes, S. C., Strosahl, K. D., & Willson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.

Kavanagh, D. J., & Wilson, P. H. (1989). Prediction of outcome with group cognitive therapy for depression. *Behaviour Research and Therapy*, *27*, 333–343.

Kelly, M. A. R., Roberts, J. E., & Ciesla, J. A. (2005). Sudden gains in cognitive behavioral treatment for depression: When do they occur and do they matter? *Behavior Research and Therapy*, *43*, 703–714.

Kelly, M.A.R., Roberts, J.E., Kashdan, T.B., Gamble, S.A., Ciesla, J.A., Calmes, C., et al. (2003). Sudden gains occurring immediately prior to formal treatment for depression. *Poster presented at the 37th Annual Convention of the Association for the Advancement of Behavior Therapy*, Boston, MA.

Kirsch, I., Mearns, J., & Catanzaro, S. J. (1990). Mood-regulation expectancies as determinants of dysphoria in college students. *Journal of Counseling Psychology*, *37*, 306–312.

Leenstra, A. S., Ormel, J., & Giel, R. (1995). Positive life change and recovery from depression and anxiety: A three-stage longitudinal study of primary care attenders. *British Journal of Psychiatry*, *166*, 333–343.

Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology*, *73*, 91–103.

Maciejewski, P. K., Prigerson, H. G., & Mazure, C. M. (2000). Self-efficacy as a mediator between stressful life events and depressive symptoms: Differences based on history of prior depression. *The British Journal of Psychiatry*, *176*, 373–378.

Muris, P. (2002). Relationships between self-efficacy and symptoms of anxiety disorders and depression in a normal adolescent sample. *Personality and Individual Differences*, *32*, 337–348.

Muris, P., Schmidt, H., Lambrichs, R., & Meesters, C. (2001). Protective and vulnerability factors of depression in normal adolescents. *Behaviour Research and Therapy*, *39*, 555–565.

O'Brien, E. J. (1985). Global self-esteem scales: Unidimensional or multidimensional? *Psychological Reports*, *57*, 383–389.

Oliver, J. M., & Baumgart, E. P. (1985). The Dysfunctional Attitude Scale: Psychometric properties and relation to depression in an unselected adult population. *Cognitive Therapy and Research*, *9*, 161–167.

Posternak, M. A., & Miller, I. (2001). Untreated short-term course of major depression: A meta-analysis of outcomes from studies using wait-list control groups. *Journal of Affective Disorders*, *66*, 139–146.

Rosenberg, M. (1979). *Conceiving the Self*. New York: Basic Books.

Saltzman, K. M., & Holahan, C. J. (2002). Social support, self-efficacy, and depressive symptoms: An integrative model. *Journal of Social and Clinical Psychology*, *21*, 309–322.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*, 219–247.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*, 1063–1078.

Snyder, C. R., Ilardi, S., Michael, S. T., & Cheavens, J. (2000). Hope theory: Updating a common process for psychological change. In C. R. Snyder, & R. E. Ingram (Eds.), *Handbook of psychological change*. New York: John Wiley & Sons.

Stiles, W. B., Leach, C., Barkham, M., Lucock, M., Iveson, S., Shapiro, D. A., et al. (2003). Early sudden gains in psychotherapy under routine clinical conditions: Practice based evidence. *Journal of Consulting and Clinical Psychology*, *71*, 14–21.

Swallow, S. R., & Kuiper, N. A. (1990). Mild depression, dysfunctional cognitions, and interest in social comparison behavior. *Journal of Social and Clinical Psychology*, *9*, 289–302.

Swallow, S. R., & Kuiper, N. A. (1992). Mild depression and frequency of social comparison behavior. *Journal of Social and Clinical Psychology*, *11*, 167–180.

Swallow, S. R., & Kuiper, N. A. (1993). Social comparison in dysphoria and nondysphoria: Differences in target similarity and specificity. *Cognitive Therapy and Research*, *17*, 103–122.

S-ware. (1997). WWW Survey Assistant. [Computer software]. Retrieved from ⟨http://survey.psy.buffalo.edu/SAdocs/licensed_users.html⟩.

Tang, T. Z., & DeRubeis, R. J. (1999). Sudden gains and critical sessions in cognitive-behavioral therapy for depression. *Journal of Consulting and Clinical Psychology*, *67*, 894–904.

Tang, T. Z., DeRubeis, R. J., Beberman, R., & Pham, T. (2005). Cognitive changes, critical sessions and sudden gains in cognitive-behavioral therapy for depression. *Journal of Consulting and Clinical Psychology*, *73*, 168–172.

Tang, T. Z., Luborsky, L., & Andrusyna, T. (2002). Sudden gains in recovering from depression: Are they also found in psychotherapies other than cognitive-behavioral therapy? *Journal of Consulting and Clinical Psychology*, *70*, 444–447.

Usaf, S. O., & Kavanagh, D. J. (1990). Mechanisms of improvement in treatment for depression: A test of self-efficacy and performance. *Journal of Cognitive Psychotherapy*, *4*, 51–70.

Vittengl, J. R., Clark, L. A., & Jarrett, R. B. (2005). Validity of sudden gains in acute phase treatment of depression. *Journal of Consulting and Clinical Psychology*, *73*, 173–182.

Weissman, A. N. (1980). Assessing depressogenic attitudes: A validation study. *Paper presented at the 51st Annual Meeting of the Eastern Psychological Association*, Hartford, CT.

Wheeler, L., & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality and Social Psychology*, *62*, 760–773.