

Motivational deficits differentially predict improvement in a randomized trial of self-system therapy for depression

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Abstract:

Objective: A randomized trial compared the time course and differential predictors of symptom improvement in 2 treatments for depression. Method: Forty-nine adults (84% female) who were not taking antidepressant medications and met diagnostic criteria for major depressive disorder or dysthymia were randomly assigned either to cognitive-behavioral therapy (CBT) or self-system therapy (SST), a treatment that targets problems in self-regulation, the ongoing process of evaluating progress toward personal goals. Self-regulatory variables (promotion and prevention focus and goal disengagement and reengagement) were assessed as potential moderators of efficacy. At intake, most participants reported depression in the moderate to severe range and had histories of recurrent episodes and previous treatment attempts. Self-reported symptoms of depression and anxiety were assessed at each therapy session. Multilevel modeling was used to examine (a) differences in change associated with the treatment conditions and (b) moderation of treatment efficacy by pretreatment measures of self-regulatory deficits. Results: Both treatments were effective and did not show differences in the magnitude or rate of symptom change or in dropout rates, suggesting that CBT and SST were equally effective in improving depression and anxiety. Patients with self-regulatory deficits, however, showed greater improvement in depressive symptoms with SST. Specifically, patients with low promotion focus and low goal reengagement responded better to SST, whereas patients with high prevention focus responded better to CBT. Conclusions: Overall, the results corroborate previous research suggesting that SST is a viable short-term treatment for depression that is particularly effective in helping patients compensate for self-regulatory deficits.

Keywords: depression | self-system therapy | cognitive therapy | goal adjustment | regulatory focus

Article:

Engagement in, and successful accomplishment of, daily goal-directed activities is fundamental in supporting emotional well-being (Carver & Scheier, 1990; Deci & Ryan, 2000; Emmons, 1986). Evidence suggests that problems in self-regulation, or the internal and transactional processes that enable control of goal-directed activities (Karoly, 1999), are associated with emotional and physical problems (Eddington, 2014; Elliot & Sheldon, 1998; Strauman & Higgins, 1987; Strauman, Woods, Schneider, Kwapil, & Coe, 2004). Major depressive disorder (MDD) is defined in part by diminished motivation or loss of interest in daily activities, and behavioral conceptualizations propose that depression stems from a lack of engagement in goal-directed activities and positively reinforcing behaviors (Jacobson, Martell, & Dimidjian, 2001; Lewinsohn & Graf, 1973).

Regulatory focus theory (RFT; Higgins, 1997) is a model of self-regulation that proposes two categories of goals, each associated with specific motivational states and strategies for goal pursuit. Promotion goals involve advancement, growth, and achievement; pursuing promotion goals means making good things happen, which is associated with either joyful or dysphoric mood, depending on one's progress. Prevention goals involve security, safety, and responsibilities/obligations; pursuing prevention goals involves keeping bad things from happening, which is associated with either quiescent or anxious affect, depending on one's progress. RFT stipulates that people whose socialization history (social/family environment during childhood) did not include an emphasis on rewarding activities and positive outcomes would have difficulty pursuing and attaining promotion goals during adolescence and adulthood and would be less oriented toward aspirations and accomplishments (Higgins, 1989; Higgins, Roney, Crowe, & Hymes, 1994). People with a low promotion focus thus have fewer opportunities to experience the positive motivational and affective states associated with moving toward promotion goals (Förster, Grant, Idson, & Higgins, 2001) and are at elevated risk for depression (Strauman, 2002). Exposure to stimuli representing one's unmet promotion goals elicits anxious and depressive feelings (Strauman, 1992) and activates areas of the cortex that have strong neural connections to areas involved in emotion and reward processing (Eddington, Dolcos, Cabeza, Krishnan, & Strauman, 2007; Eddington et al., 2009).

Strauman, Kolden, et al. (2001) found that three traditional, empirically supported treatments—cognitive-behavioral therapy (CBT), interpersonal psychotherapy (IPT), and pharmacotherapy with selective serotonin reuptake inhibitors—were less effective for depressed adults with perceived failure in promotion goal pursuit than for other depressed patients. They concluded that interventions that directly target self-regulatory processes may be more effective for patients whose depression is associated with low promotion goal pursuit. An important question concerns whether these patients can learn skills to compensate for deficiencies in self-regulation. Self-system therapy (SST), a recent addition to the empirically supported treatments for depression, aims to translate basic research on goal pursuit and self-regulation to the intervention context (Vieth et al., 2003), providing a means of improving patients' self-regulatory skills. SST is a short-term therapy that targets problems in self-regulation and was conceptualized as a treatment that would be particularly effective for depressed people with problems in self-regulation, such as problems with pursuing and achieving promotion-type personal goals. The

proposed mechanism of action in SST, therefore, is distinguishable in theory from that of other therapies such as CBT and IPT (Vieth et al., 2003), although it borrows specific strategies (adapted for the purposes of improving self-regulation) from other empirically validated treatment approaches.

SST is hypothesized to produce symptom improvement through changes in goal representation (how people think about their goals) and goal pursuit (how people go about trying to achieve their goals). In CBT, the primary focus is on recognizing and challenging dysfunctional negative thoughts. In SST, the primary focus is on identifying the personal goals, standards, and expectations that guide the patient's behavior and on initiating changes that allow the patient to be more successful in goal pursuit, particularly for promotion-type goals. SST consists of three treatment phases: orientation (setting treatment goals, introducing concepts of promotion and prevention, and discussing the impact of the patient's own socialization history on his or her regulatory focus), exploration (closely examining self-standards as they come into play in daily situations and events), and adaptation (implementing specific strategies to improve self-regulation).

Strauman et al. (2006) conducted a randomized clinical trial to determine whether SST was more effective than CBT for depressed patients with a poor promotion socialization history. Both CBT and SST were efficacious overall, but SST was more effective for patients whose self-reported socialization history lacked a promotion emphasis. Using a priming procedure in which the emotional content of responses to idiographic promotion goals was assessed before and after treatment, Strauman et al. (2006) found that the dysphoric content of responses was lower following treatment with SST compared with CBT. Taken together, these findings show that SST is effective for treating depression—especially for patients with a low promotion orientation—and that the two treatments may have different mechanisms of action. Further, these results suggest that, rather than capitalizing on existing strengths in self-regulation, SST targets strategies that help patients compensate for deficits in self-regulation.

In the Strauman et al. (2006) clinical trial, treatment dose was unconstrained, the mean number of sessions was 22 (minimum = 10, maximum = 31), and symptom change was examined at only two time points (pre- and posttreatment). In addition, the initial trial included adults whose depression was, on average, at the low end of the moderate range. Since that initial trial, SST has been condensed into a manualized, 16-session protocol (for the original research manual, see Strauman, Vieth, et al., 2001). The current study aimed to examine the efficacy of the shorter protocol in comparison with traditional CBT and to examine its efficacy in a sample of adults whose depression was in the moderate to severe range. Further, we examined whether the two treatments showed differential efficacy for depressed adults with deficits in self-regulation. Specifically, we sought to replicate and extend previous results showing that SST is more effective for depressed patients low in promotion orientation. As such, we assessed promotion and prevention orientations with the more widely used measures of success with promotion and prevention means of goal attainment (Higgins et al., 2001) rather than measures of socialization history.

We also included an additional measure of self-regulatory function: goal adjustment, the ability to respond flexibly to obstacles in goal pursuit (e.g., unexpected obstacles, stalled progress).

Goal adjustment is associated with higher well-being. Specifically, studies have shown that the ability to disengage from unattainable goals and reengage in new goals predicts higher levels of emotional and physical well-being (Rasmussen, Wrosch, Scheier, & Carver, 2006; Wrosch, Scheier, Carver, & Schulz, 2003; Wrosch, Scheier, Miller, Schulz, & Carver, 2003). Consistent with the notion that SST helps patients compensate for self-regulatory deficits, patients with poorer goal adjustment are expected to benefit more from SST than from CBT.

In this study, symptoms of depression were assessed at each treatment session, rather than only at pre- and posttreatment, and trajectories of change over time were modeled to examine predictors of symptom change over the course of treatment. The present study thus offered a more comprehensive assessment of the process of change during the course of psychotherapy. We predicted that, consistent with the previous randomized trial, SST would be as effective as CBT overall for reducing depressive symptoms, even with a shorter treatment protocol and higher levels of depression severity. Further, we predicted that SST would be more effective with patients showing deficits in self-regulation, particularly people lower in promotion focus. We examined the role of prevention focus but did not have a priori hypotheses about those results. We also conducted exploratory analyses of the relative efficacy of the two treatments for reducing anxiety symptoms. The original SST–CBT trial did not report outcomes for anxiety, but because depression and anxiety are often comorbid, it is important to determine whether SST is more or less effective in reducing anxiety symptoms.

Method

Participants

Participants were recruited from the greater Greensboro, North Carolina, area, primarily through advertisements in local health magazines, flyers placed in outpatient mental health clinics, and online recruitment. Inclusion criteria were as follows: ability to comply with the requirements of the study, primary Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev. [DSM–IV–TR]; American Psychiatric Association, 2000) diagnosis of MDD or dysthymia, Beck Depression Inventory–II (BDI-II) score above 14 (indicating more than minimal symptoms; A. T. Beck, Steer, & Brown, 1996), no antidepressant medication use (or herbal remedies for depression) for the past 4 months, no history of mania, no active substance dependence for the previous 6 months, no history of psychotic symptoms, no diagnosis of antisocial or borderline personality disorders, and no active suicidal intent or immediate threats of self-harm. Exclusionary symptoms and conditions were assessed using the Structured Clinical Interview for DSM–IV–TR Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 2002) and the Structured Clinical Interview for DSM–IV Axis II Personality Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997).

One hundred adults completed a phone screening and were invited to complete a more thorough assessment in the laboratory (see enrollment flowchart in Figure 1). Fifty-six adults met inclusion criteria and were assigned to either SST ($n = 27$) or CBT ($n = 29$) using a restricted randomization procedure. A random number generator was used to establish the initial assignments. Alterations to the sequence were made when a therapist for the assigned condition was not available or (near the end of the trial) in an attempt to balance sample sizes. Seven of the

56 participants did not return for the first treatment session and therefore were not included in the subsequent analyses. Thus, the final sample consisted of 49 participants in SST (n = 22) and CBT (n = 27). Details on the final sample demographics, symptom severity at intake, diagnostic status, and treatment history are shown in Table 1. Some data on sample race and ethnicity were missing due to experimenter error, but it should be noted that the majority of the sample consisted of non-Hispanic/Latino White participants. The only significant difference in demographic variables or pretreatment symptom severity was a greater prevalence of dysthymia (primary or secondary) in the CBT condition. Across the two conditions, the participants had a mean intake BDI-II score of 34.6 (SD = 8.5), which is at the low end of the severe range, and a mean intake Beck Anxiety Inventory (BAI; A. T. Beck, Epstein, Brown, & Steer, 1988) score of 23.0 (SD = 14.7), which is in the moderate range.

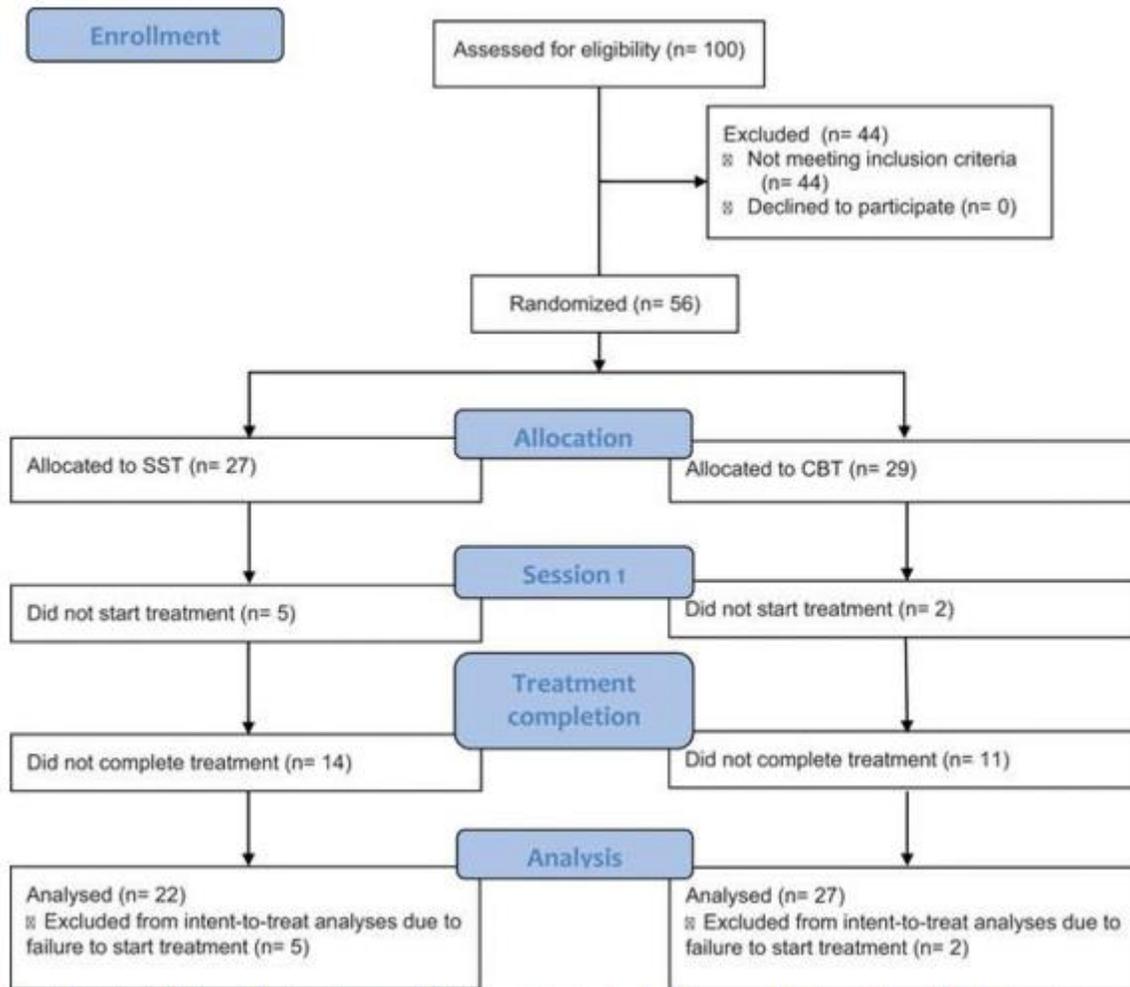


Figure 1. Enrollment flowchart. SST = self-system therapy; CBT = cognitive-behavioral therapy. See the online article for the color version of this figure.

Table 1
Sample Demographics and Intake Diagnostic and Severity Data by Condition

Variable	SST (<i>n</i> = 22)	CBT (<i>n</i> = 27)	Statistic	<i>p</i>
Age (<i>M, SD</i>)	37.86 (12.94)	37.89 (13.22)	<i>t</i> (47) = 0.01	.995
Sex	81.8% female	85.2% female	Fisher's exact test	1.00
Highest level of education			$\chi^2(2) = 0.53$.770
High school or below	22.7%	14.8%		
Some college or college degree	59.1%	66.6%		
Some graduate school or advanced degree	18.1%	18.5%		
Employment status	68.2% employed	70.4% employed	$\chi^2(1) = 0.03$.869
Marital status			$\chi^2(3) = 1.72$.633
Married	27.3%	25.9%		
Divorced	22.7%	22.2%		
Separated	00.0%	7.4%		
Never married	50.0%	44.4%		
Diagnostic status				
Primary MDD	100%	92.6%	Fisher's exact test	.495
Dysthymia	13.6%	40.7%	$\chi^2(1) = 4.36$.037*
Secondary anxiety disorder	56.3%	72.7%	$\chi^2(1) = 1.16$.282
Past substance abuse	13.6%	7.4%	Fisher's exact test	.646
Treatment history				
Past therapy	81.8%	92.6%	Fisher's exact test	.388
Past medications	36.4%	40.7%	$\chi^2(1) = 0.10$.754
Past hospitalization	31.8%	29.6%	$\chi^2(1) = 0.03$.869
BDI-II score at intake (<i>M, SD</i>)	35.68 (10.06)	33.70 (7.01)	<i>t</i> (47) = 1.35	.185
BAI score at intake (<i>M, SD</i>)	19.91 (13.35)	25.56 (15.53)	<i>r</i> (47) = -0.81	.422

Note. *N* = 49. SST = self-system therapy; CBT = cognitive-behavior therapy; MDD = major depressive disorder; BDI-II = Beck Depression Inventory-II; BAI = Beck Anxiety Inventory.

* *p* < .05.

Sample Demographics and Intake Diagnostic and Severity Data by Condition

Measures

SCID-I and SCID-II

The SCID-I (First et al., 2002) and SCID-II (First et al., 1997) are widely used semistructured diagnostic interviews for DSM-IV-TR (American Psychiatric Association, 2000) Axis I and Axis II disorders, respectively. From the SCID-I, diagnosticians completed the overview and screening sections, mood modules, anxiety modules, and psychotic symptoms. Additional modules (e.g., substance abuse and dependence, eating disorders) were used as needed on the basis of a participant's responses to the screening items. From the SCID-II, diagnosticians completed the antisocial and borderline personality disorders modules only.

BDI-II

The BDI-II (A. T. Beck et al., 1996) is a widely used assessment of patient-reported depressive symptom severity for the past 2 weeks. There are 21 items, and each is rated on a four-point scale (0–3), with total scores ranging from 0 to 63. The BDI-II has excellent psychometric properties (Dozois & Covin, 2004), and the internal consistency in this study was good (Cronbach's $\alpha = .84$).

BAI

The BAI (A. T. Beck et al., 1988) is a widely used measure of anxiety symptom severity for the past 2 weeks with good psychometric properties (Fydrich, Dowdall, & Chambless, 1992). There

are 21 items, and each is rated on a four-point scale (0–3), with total scores ranging from 0 to 63. In this study, internal consistency was very good (Cronbach's $\alpha = .95$).

Regulatory Focus Questionnaire (RFQ)

The RFQ (Higgins et al., 2001) is an 11-item measure that assesses subjective history of success using promotion- and prevention-oriented goal attainment. Each item is rated on a five-point scale, and there are two subscales (Promotion Focus and Prevention Focus). An example item for promotion focus is “Compared to most people, are you typically unable to get what you want out of life?” (reverse-coded); an example item for prevention focus is “How often did you obey rules and regulations that were established by your parents?” Previous studies have reported good internal consistency values (Cronbach's alphas) of .73 and .80 for the Promotion Focus and Prevention Focus subscales, respectively (Higgins et al., 2001). In the current study, internal consistencies (Cronbach's alphas) were .73 for the Promotion Focus subscale and .82 for the Prevention Focus subscale.

Goal Adjustment Scale (GAS)

The GAS (Wrosch, Scheier, Miller, et al., 2003) consists of 10 items, four measuring goal disengagement (GAS-D) and six measuring goal reengagement (GAS-R). The questionnaire instructs respondents to consider how they usually react when they have to stop pursuing important goals in their lives (e.g., “I start working on other goals” reflects reengagement; “I find it difficult to stop trying to achieve the goal” reflects disengagement). Item statements are rated on a five-point scale (1–5), with higher scores indicating better ability to disengage from goals (GAS-D) or to reengage in alternative goals (GAS-R) in the face of failure. Good internal consistencies for GAS-D (Cronbach's $\alpha = .84$) and GAS-R (Cronbach's $\alpha = .86$) have been reported (Wrosch, Scheier, Miller, et al., 2003); internal consistencies (Cronbach's alphas) in the current study were .82 for GAS-D and .80 for GAS-R.

Treatment Conditions

SST

SST is a brief, structured therapy that draws on motivational theories of depression and integrates techniques from established depression treatment protocols. The treatment involves assessing the patient's goal pursuit history and style while identifying (and correcting) deficiencies in goal pursuit (especially promotion orientation). In the current study, a 16-session SST protocol was used that included a clinician manual and patient worksheets; a detailed description of the development of SST has been provided by Vieth et al. (2003).

CBT

The CBT condition (also 16 sessions) was based on two widely used treatment guides: Cognitive Behavior Therapy: Basics and Beyond (J. S. Beck, 2011), a fundamental therapist CBT guide, and Mind Over Mood: Change How You Feel by Changing the Way You Think (Greenberger & Padesky, 1995), a patient-oriented CBT guide with worksheets and patient-directed readings.

The full protocol included psychoeducation about depression, behavioral activation, development of a cognitive conceptualization and identification of core beliefs, cognitive restructuring, and relapse prevention, and it was guided in sequence by worksheets from the Mind Over Mood workbook.

Therapists

Therapists were six master's-level trainees (including Tamara E. Foxworth) enrolled in a clinical psychology doctoral program and one doctoral-level clinician who had just completed a predoctoral internship. All therapists were required to have had at least 250 direct patient contact hours to serve as study therapists and to have had prior supervised training in structured, empirically based individual therapy. All the therapists had prior training in cognitive-behavioral treatment approaches with adult patients. Three of the seven therapists saw 3–4 patients each, and the remaining four therapists saw 9–11 patients each.

Therapist training and adherence monitoring

The study included three SST therapists and four CBT therapists; individual therapists provided treatment for only one of the two conditions. The primary rationale was that some of the therapists were only available to see a limited number of participants, and we anticipated that focused training in one condition would result in better adherence and competency. We used a preceptor training model in which a primary supervisor (Kari M. Eddington, a certified cognitive therapy trainer who is also trained in SST) provided intensive individual supervision and feedback to ensure treatment condition adherence. Didactic training for the SST therapists included assigned reading of the manual and worksheet packet followed by a half-day orientation and training session conducted by Timothy J. Strauman, one of the original developers of SST. Therapists in the CBT condition required relatively less training because they were already well-versed in CBT techniques and strategies from their coursework and practicum training. CBT training, which also followed the preceptor model, included assigned reading of the two treatment guides followed by a 1-hr training provided by Kari M. Eddington.

In addition to didactic training, each therapist met weekly with the primary supervisor (Kari M. Eddington) to monitor compliance with the assigned treatment condition. Every session was audiotaped, and tapes of every session for each therapist's first assigned patient were reviewed by the supervisor. Following the first assigned patient, if compliance was consistently good, random reviews of audiotaped sessions were conducted, although weekly supervision meetings continued throughout the course of treatment for all patients. Failure to adhere to the protocol would have resulted in a remediation process that included additional training and monitoring, although no adherence violations occurred.

A quasi-random selection of 105 session audio recordings was coded for adherence by independent coders. To ensure that adherence across the full course of therapy was assessed for each participant, recordings were divided into three treatment phases: Sessions 2–6, 7–11, and 12–15. The first and final sessions were excluded from selection because the focus in those sessions (background and psychoeducation in Session 1; relapse prevention and review in Session 16) overlapped substantially in the two treatment conditions. Using a random number

generator, one session per phase was selected for coding. Sessions from seven participants who completed fewer than three sessions total were not included in the adherence coding.

Sessions were coded using a scale similar to that described in Strauman et al. (2006), which was based on the Collaborative Study Psychotherapy Rating Scale (Evans, Piasecki, Kriss, & Hollon, 1984). The 54 adherence items consisted of three scales: common factors ([CFs] 21 items; Cronbach's $\alpha = .70$), SST adherence (18 items; Cronbach's $\alpha = .83$), and CBT adherence (15 items; Cronbach's $\alpha = .84$). Items were summed to yield a total score for each of the three scales. Eighty percent of the 105 sessions were independently coded by a second coder to evaluate interrater reliability of the coding scales.

Procedures

During the initial laboratory assessment, participants provided informed consent, completed the BDI-II and BAI, and (if the BDI-II score was above 14) completed relevant portions of the SCID-I and SCID-II. Diagnostic interviews were conducted by graduate students enrolled in a clinical psychology doctoral program who had received training on the administration of the SCID-I and SCID-II. Consultation on diagnostic interviews was provided by licensed, doctoral-level psychologists (Kari M. Eddington and Thomas R. Kwapil) with extensive experience both with diagnostic assessment and administration of the SCID-I and SCID-II. Following completion of the diagnostic interviews, participants completed a short battery of questionnaires on a computer and were given further instructions about the treatment portion of the study. One week after the initial assessment, participants began the treatment phase of the study. Individual outpatient sessions were conducted at the University of North Carolina at Greensboro Psychology Clinic. Prior to each therapy session, participants completed both the BDI-II and the BAI. Sessions were scheduled once weekly for 50 min, but the full course of treatment was not restricted to 16 weeks and often exceeded that length as a result of rescheduling due to illness, work conflicts, and other unexpected events. Participants received treatment at no cost and were compensated for the time required for data collection outside of the therapy sessions. Data entry and coding were done by research assistants who were unaware of the participants' treatment conditions.

Results

Therapist Adherence to Treatment Protocols

Intraclass correlation coefficients (ICCs) were calculated for each of the three adherence scales (CFs, SST, and CBT) to assess interrater reliability. Results showed good reliability for all three scales (CFs = .89, SST = .74, and CBT = .78). Mean item ratings for all sessions, coded by two raters, were used in subsequent analyses.

SST sessions had significantly higher mean scores on the SST adherence scale ($M = 35.76$, $SD = 9.61$) compared with CBT sessions ($M = 19.02$, $SD = 3.00$), $t(58) = -11.18$, $p < .001$. Likewise, CBT sessions had significantly higher mean scores on the CBT adherence scale ($M = 35.25$, $SD = 9.06$) compared with SST sessions ($M = 17.89$, $SD = 4.19$), $t(78) = -11.18$, $p < .001$. For the

CFs adherence scale, SST sessions also had slightly higher mean scores ($M = 69.74$, $SD = 12.82$) compared with CBT sessions ($M = 64.07$, $SD = 8.81$), $t(86) = -2.62$, $p < .05$.

Model Specification and Analytic Approach

Following an intent-to-treat framework, we included all available data in the analyses. The primary analytic approach was multilevel modeling, which accommodates between-persons and within-person effects in light of missing data and unequal numbers of observations per participant (Raudenbush & Bryk, 2002; Singer & Willett, 2003). The models were estimated in HLM 7 (Scientific Software International, Inc., Skokie, IL) using restricted maximum likelihood with robust standard errors, which performs better than full maximum likelihood when Level 2 sample sizes are smaller (Maas & Hox, 2005). At Level 1, the within-person level, time was specified according to sessions: The first session was scored as 0, yielding a range from 0 to 15 and making the intercept interpretable as BDI-II scores at the first session. A quadratic term was created by squaring the linear term. At Level 2, treatment condition was scored as 0 for CBT and 1 for SST. The potential moderators (e.g., prevention and promotion focus) were standardized to create a meaningful 0 point. All intercepts and slopes were modeled as random.

Effect sizes in multilevel modeling are considerably more complex than in conventional single-level models. To estimate effect sizes, we computed the proportional reduction in unexplained variance (PRV), which evaluates the reduction in variance at a particular level when a predictor is added (Raudenbush & Bryk, 2002). One well-known issue with PRV is that it can occasionally yield small negative values (Snijders & Bosker, 1994), which is more likely to happen when “a truly nonsignificant predictor is entered into the equation” (Raudenbush & Bryk, 2002, p. 150).

A null model of BDI-II scores found an ICC of .526, indicating that roughly equal amounts of variance in BDI-II scores were at Level 1 (47.4%) and Level 2 (52.6%). Descriptive statistics and intercorrelations among the self-regulation measures and intake symptom scores are shown in Table 2.

Table 2
Descriptive Statistics and Correlations for Self-Regulatory Variables and Symptom Severity at Intake

Variable	<i>M</i>	<i>SD</i>	Min	Max	1	2	3	4	5	6	7
1. Treatment condition ^a	.45	.50	0	1	—						
2. BDI-II (intake)	34.59	8.48	22	56	.12	—					
3. BAI (intake)	23.02	14.72	1	57	-.19	.44*	—				
4. Promotion orientation	18.63	4.30	6	27	-.04	-.30*	-.07	—			
5. Prevention orientation	19.69	4.83	6	30	-.21	-.27	-.22	.04	—		
6. Goal disengagement	11.90	3.43	4	20	.16	-.23	-.17	-.17	-.07	—	
7. Goal reengagement	19.67	3.83	7	25	-.16	-.28*	.17	.45*	.33*	-.17	—

Note. Min = minimum; Max = maximum.

^a 0 = cognitive-behavioral therapy, 1 = self-system therapy.

* $p < .05$.

Descriptive Statistics and Correlations for Self-Regulatory Variables and Symptom Severity at Intake

Change in Depressive Symptoms and Treatment Efficacy

The first model estimated the within-person trajectories of change across sessions; Table 3 depicts the results. This model estimated linear and quadratic effects of time on BDI-II scores:

$$\text{Level 1: BDI} - \Pi_{ij} = \beta_{0j} + \beta_{1j} (\text{Session})_{ij} + \beta_{2j} (\text{Session}^2)_{ij} + r_{ij};$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$

$$\beta_{2j} = \gamma_{20} + \mu_{2j}.$$

and

Table 3
Multilevel Model for Change in BDI-II Scores Across Sessions and Treatment Conditions

Fixed effect	Estimate	SE	t	p
Intercept	30.82	1.39	22.10	<.001
Session: Linear	-1.75	0.34	5.07	<.001
Session: Quadratic	0.04	0.02	2.26	.028
Random effect	Variance component	df	χ^2	p
L2: Intercept	82.95	42	270.27	<.001
L2: Linear slope	3.70	42	117.41	<.001
L2: Quadratic slope	0.01	42	90.22	<.001
L1: Residual	27.70			
Model fit	Deviance	Parameters	AIC	BIC
Index	3,885.30	7	3,899.30	3,929.93

Note. $N = 49$ participants (Level 2 [L2]); $N = 587$ observed sessions (Level 1 [L1]; 16 maximum per participant). Session is coded 0 (first week) to 15 in increments of 1. BDI-II = Beck Depression Inventory-II; AIC = Akaike information criterion; BIC = Bayesian information criterion.

Multilevel Model for Change in BDI-II Scores Across Sessions and Treatment Conditions

The model found significant linear ($\gamma = -1.75$, $SE = 0.34$, $p < .001$) and quadratic ($\gamma = 0.04$, $SE = 0.02$, $p = .028$) effects of time, reflecting the substantial drop in BDI-II scores across the sessions and the tendency for gains to be greatest in the earlier sessions. Regarding effect sizes, including the linear effect of time reduced the unexplained variance by 56.67%, and adding both the linear and quadratic effects reduced the unexplained variance by 60.66%, so the effect of sessions on BDI-II scores was substantial. Because subsequent analyses found very few moderating effects of the quadratic component, and because the quadratic component explained a fairly small amount of incremental variance, subsequent analyses simplified the model by omitting the quadratic component and estimating the moderators of linear change.

Our next model examined the effect of condition to evaluate whether CBT and SST had different rates of change across sessions:

$$\text{Level 1: BDI} - \Pi_{ij} = \beta_{0j} + \beta_{1j} (\text{Session})_{ij} + r_{ij};$$

and

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01} (\text{Condition})_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} (\text{Condition})_j + \mu_{1j}.$$

BDI-II scores across sessions for each condition are depicted in Figure 2. The multilevel model, reported in Table 4, revealed a nonsignificant effect of treatment condition on the rate of change ($\gamma = -0.49$, $SE = 0.35$, $p < .164$), suggesting that CBT and SST were equally effective overall. Regarding the effect size, adding treatment condition as a predictor of the within-person slopes reduced the variance component by only 2.11%.

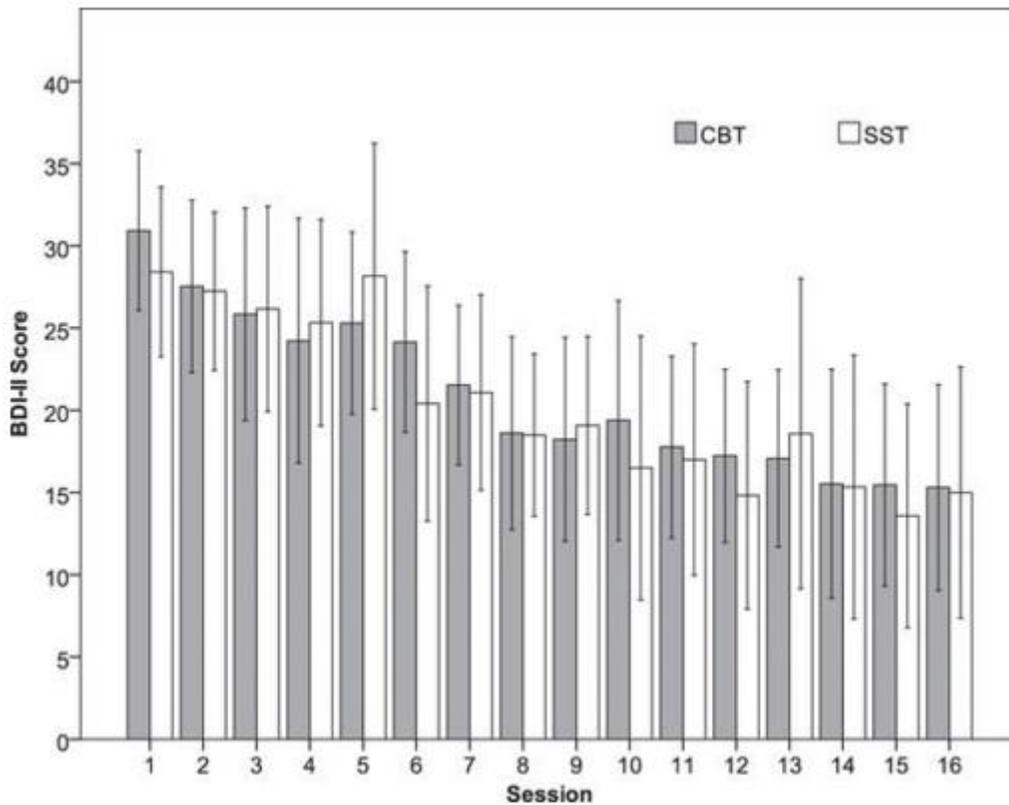


Figure 2. Weekly Beck Depression Inventory–II (BDI-II) levels by treatment condition. Error bars represent 95% between-persons confidence intervals. CBT = cognitive–behavioral therapy; SST = self-system therapy.

Table 4

Multilevel Model for Change in Depression (BDI-II) Scores as Moderated by Treatment, Promotion, and Prevention Factors

Fixed effect	Treatment condition model				Condition and promotion focus model				Condition and prevention focus model			
	Estimate	SE	<i>t</i>	<i>p</i>	Estimate	SE	<i>t</i>	<i>p</i>	Estimate	SE	<i>t</i>	<i>p</i>
Intercept	29.15	1.72	16.93	<.001	29.18	1.67	17.51	<.001	29.77	1.62	18.41	<.001
Session: Linear	-0.95	0.20	4.83	<.001	-0.93	0.20	4.55	<.001	-0.88	0.23	3.87	<.001
Condition	1.16	2.76	0.42	.676	0.97	2.46	0.40	.694	-0.12	2.70	0.04	.965
Condition × Session	-0.49	0.35	1.42	.164	-0.50	0.30	1.65	.105	-0.28	0.31	0.91	.37
Promotion					-2.07	2.06	1.00	.321				
Promotion × Session					-0.20	0.20	0.99	.324				
Promotion × Treatment					-3.22	2.68	1.20	.236				
Promotion × Session × Treatment					0.99	0.31	3.22	.002				
Prevention									-3.61	1.31	2.76	.008
Prevention × Session									-0.33	0.21	1.58	.122
Prevention × Treatment									1.16	2.59	0.45	.657
Prevention × Session × Treatment									1.11	0.26	4.21	<.001

Random effect	Treatment condition model				Condition and promotion focus model				Condition and prevention focus model			
	Variance component	<i>df</i>	χ^2	<i>p</i>	Variance component	<i>df</i>	χ^2	<i>p</i>	Variance component	<i>df</i>	χ^2	<i>p</i>
Intercept (μ_0)	84.99	45	472.17	<.001	72.92	43	401.78	<.001	77.66	43	406.19	<.001
Linear slope (μ_1)	1.07	45	343.68	<.001	0.79	43	280.04	<.001	0.82	43	271.43	<.001
L1: Residual (r_{ij})	30.49				30.45				30.45			

Model fit	Treatment condition model				Condition and promotion focus model				Condition and prevention focus model			
	Deviance	Parameters	AIC	BIC	Deviance	Parameters	AIC	BIC	Deviance	Parameters	AIC	BIC
Index	3,905.21	4	3,913.21	3,930.71	3,883.59	4	3,891.59	3,909.09	3,883.17	4	3,891.17	3,908.67

Note. *N* = 49 participants (Level 2); *N* = 587 observed sessions (Level 1 [L1]; 16 maximum per participant). Session is coded 0 (first week) to 15 in increments of 1. Condition is coded 0 = cognitive-behavioral therapy, 1 = self-system therapy. Prevention and promotion scores are standardized. BDI-II = Beck Depression Inventory-II; AIC = Akaike information criterion; BIC = Bayesian information criterion.

Multilevel Model for Change in Depression (BDI-II) Scores as Moderated by Treatment, Promotion, and Prevention Factors

An additional metric of change is the percentage of participants who ended participation with scores below 14, a common cutoff informed by clinical guidance and research on clinically significant change (Seggar, Lambert, & Hansen, 2002). The percentages of participants who ended with scores below 14 were similar for the CBT (40.7% [11 of 27]) and SST (54.5% [12 of 22]) conditions. A logistic regression (BDI-II \geq 14 = 0, BDI-II < 14 = 1) model did not find a significant difference between the therapy conditions ($b = .56$, $SE = .58$, $p = .37$, odds ratio [OR] = 1.75, OR 95% confidence interval CI [0.56, 5.44]).

Self-Regulatory Moderators of Treatment Efficacy

Our next models examined whether self-regulatory factors moderated the efficacy of CBT and SST. These models included the main effect of a self-regulatory factor and, critically, its interaction with the treatment condition. Each model had the same specification. For example, the model that examined promotion focus as a moderator was specified as follows:

$$\text{Level 1: } BDI - II_{ij} = \beta_{0j} + \beta_{1j} (\text{Session})_{ij} + r_{ij};$$

and

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01} (\text{Condition})_j + \gamma_{02} (\text{Promotion})_j + \gamma_{03} (\text{Condition} \times \text{Promotion})_j + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} (\text{Condition})_j + \gamma_{12} (\text{Promotion})_j + \gamma_{13} (\text{Condition} \times \text{Promotion})_j + \mu_{1j}.$$

Table 4 displays the results of these models.

Promotion focus and prevention focus

We first examined promotion focus and prevention focus, assessed using the RFQ, as moderators. For promotion focus, the multilevel model found a significant Session \times Treatment \times Promotion interaction ($\gamma = 0.99$, $SE = 0.31$, $p = .002$). The model-estimated BDI-II scores for Sessions 1 and 16 for people low and high in promotion focus are shown in Figure 3.

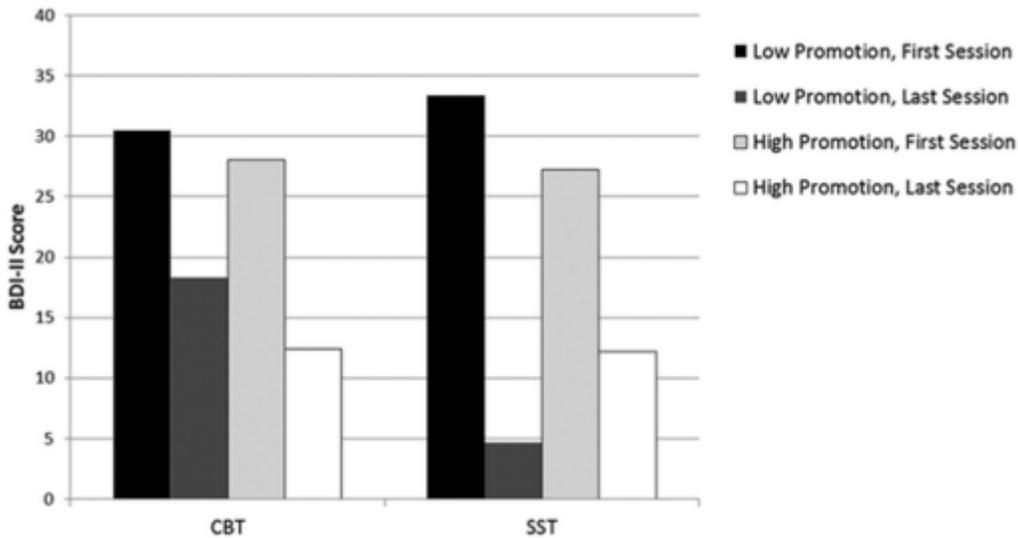


Figure 3. Moderating effects of promotion focus on change in Beck Depression Inventory–II (BDI-II) scores for cognitive–behavioral therapy (CBT) and self-system therapy (SST). The effects are estimated for Sessions 1 and 16 for the 25% and 75% values of promotion focus.

As expected, people low in promotion focus showed greater improvement in SST than in CBT. We estimated the percentage reduction in variance by comparing the model with one in which treatment condition was the only predictor. Compared with this treatment-only baseline model, including promotion’s main effect and interaction with treatment condition reduced the unexplained variance in change slopes by 25.59%.

For prevention focus, a similar pattern appeared. The multilevel model found a significant Session \times Treatment \times Prevention interaction ($\gamma = 1.11$, $SE = 0.26$, $p < .001$). The model-estimated BDI-II scores are shown in Figure 4. People high in prevention focus benefitted more from CBT than from SST. People high in prevention focus also had significantly lower

intercepts, reflecting lower first-session BDI-II scores ($\gamma = -3.61$, $SE = 1.31$, $p = .008$). Compared with the treatment-only baseline model, including prevention's main effect and interaction with treatment condition reduced the unexplained variance in change slopes by 24.02%.

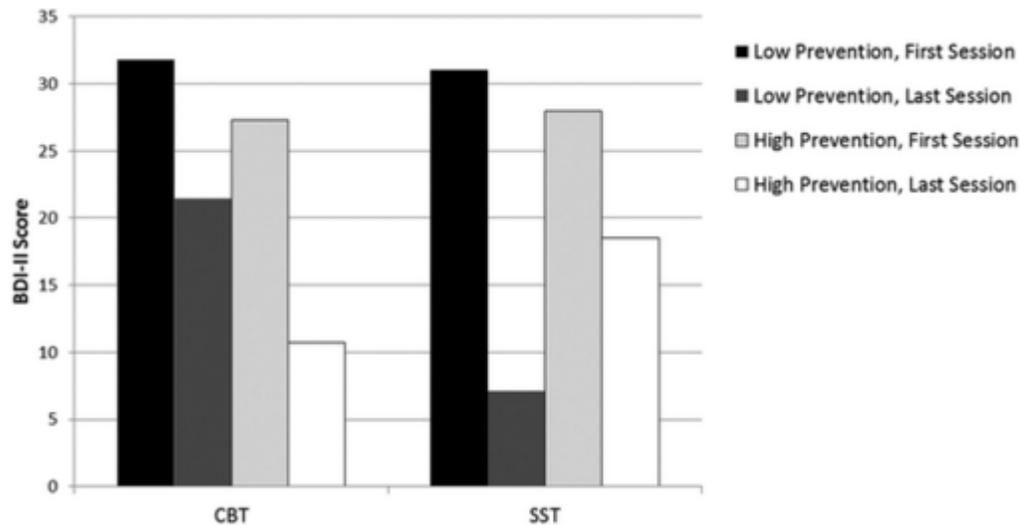


Figure 4. Moderating effects of prevention focus on change in Beck Depression Inventory–II (BDI-II) scores for cognitive–behavioral therapy (CBT) and self-system therapy (SST). The effects are estimated for Sessions 1 and 16 for the 25% and 75% values of prevention focus.

Goal disengagement and goal reengagement

Our next models examined the two facets of the GAS: goal disengagement and goal reengagement. Goal disengagement did not moderate the effect of treatment condition on change in BDI-II scores or have any other significant effects; the results are displayed in Table 4. This model yielded an example of a small negative percentage reduction in variance, which can occur in some cases (e.g., when Level 2 predictors are added that have essentially no effect; Raudenbush & Bryk, 2002, p. 150).

Goal reengagement, in contrast, yielded several important significant effects (see Table 5). People high in goal reengagement had significantly lower intercepts, reflecting lower first-session BDI-II scores ($\gamma = -3.44$, $SE = 1.48$, $p = .025$). Most relevant, however, is that goal reengagement significantly moderated the effect of treatment condition on change in BDI-II scores ($\gamma = 0.76$, $SE = 0.27$, $p = .007$). The pattern is depicted in Figure 5. As the figure shows, people low in goal reengagement benefitted more from SST than from CBT. People high in goal reengagement, in contrast, benefitted equally from CBT and SST. Adding GAS-R and its interaction with treatment condition yielded a 29.89% reduction in the variance of the change slopes compared with the treatment-only baseline model.

Table 5
 Multilevel Model for Change in Depression (BDI-II) Scores as Moderated by Treatment, Goal Disengagement, and Goal Reengagement Factors

Fixed effect	Condition and goal disengagement model				Condition and goal reengagement model			
	Estimate	SE	t	p	Estimate	SE	t	p
Intercept	29.22	1.74	16.79	<.001	29.63	1.57	18.88	<.001
Session: Linear	-0.96	0.21	4.61	<.001	-0.95	0.20	4.75	<.001
Condition	0.97	2.86	0.34	.737	-0.14	2.40	0.06	.953
Condition × Session	-0.48	0.37	1.32	.193	-0.39	0.29	1.33	.191
Disengagement	0.52	1.70	0.31	.760				
Disengagement × Session	-0.05	0.24	0.23	.822				
Disengagement × Treatment	0.29	2.92	0.10	.921				
Disengagement × Session × Treatment	0.03	0.40	0.06	.951				
Reengagement					-3.44	1.48	2.32	.025
Reengagement × Session					0.03	0.20	0.16	.874
Reengagement × Treatment					-1.69	2.46	0.69	.496
Reengagement × Session × Treatment					0.76	0.27	2.84	.007

Random effect	Condition and goal disengagement model				Condition and goal reengagement model			
	Variance component	df	χ^2	p	Variance component	df	χ^2	p
Intercept (μ_0)	88.74	43	468.55	<.001	69.98	43	383.10	<.001
Linear slope (μ_1)	1.15	43	360.88	<.001	0.75	43	259.84	<.001
L1: Residual (r_{ij})	30.47				30.49			

Model fit	Condition and goal disengagement model				Condition and goal reengagement model			
	Deviance	Parameters	AIC	BIC	Deviance	Parameters	AIC	BIC
Index	3,900.61	4	3,908.61	3,926.11	3,882.48	4	3,890.48	3,907.98

Note. $N = 49$ participants (Level 2); $N = 587$ observed sessions (Level 1 [L1]; 16 maximum per participant). Session is coded 0 (first week) to 15 in increments of 1. Condition is coded 0 = cognitive-behavioral therapy, 1 = self-system therapy. Goal disengagement and goal reengagement are standardized. BDI-II = Beck Depression Inventory-II; AIC = Akaike information criterion; BIC = Bayesian information criterion.

Multilevel Model for Change in Depression (BDI-II) Scores as Moderated by Treatment, Goal Disengagement, and Goal Reengagement Factors

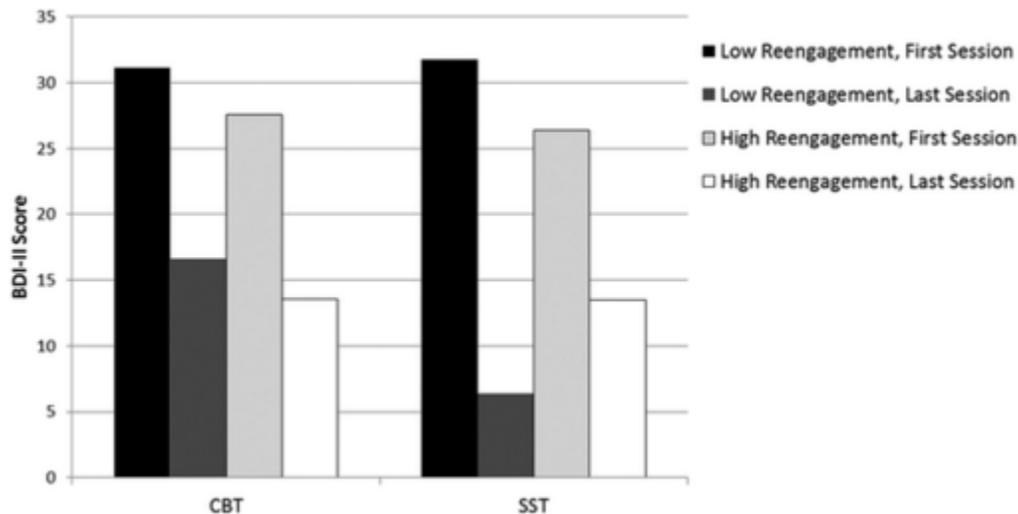


Figure 5. Moderating effects of goal reengagement on change in Beck Depression Inventory-II (BDI-II) scores for cognitive-behavioral therapy (CBT) and self-system therapy (SST). The effects are estimated for Sessions 1 and 16 for the 25% and 75% values of goal reengagement.

Summary of the self-regulatory moderators

The prediction that participants with self-regulatory deficits would benefit more from SST than from CBT was supported. Consistent with the previous trial (Strauman et al., 2006), low promotion focus was associated with a greater decline in depressive symptoms in the SST condition. Low prevention focus showed a similar pattern. Regarding goal adjustment, SST was more effective than CBT for patients with difficulties with goal reengagement, but no differences were found for disengagement.

Effects of CBT and SST on Anxiety

Multilevel models found that anxiety, measured at each session with the BAI, declined as well. The ICC for BAI scores was .676, so most of the variance (67.6%) was at the between-persons level. A within-person model found significant linear ($\gamma = -1.55$, $SE = 0.25$, $p < .001$) and quadratic ($\gamma = 0.07$, $SE = 0.01$, $p < .001$) effects of time, reflecting an overall decline in BAI scores from the initial level ($\gamma = 16.74$, $SE = 1.40$, $p < .001$) across the sessions, particularly in the early weeks. Regarding effect size, including the linear and quadratic effects of session reduced the unexplained variance in BAI scores by 45.63%.

Subsequent models examined whether treatment condition and self-regulatory constructs moderated the linear change in BAI scores across sessions. As shown in Table 6, there was a nonsignificant effect of treatment condition on the rate of linear change ($\gamma = -0.10$, $SE = 0.23$, $p < .648$), suggesting that CBT and SST were also equally effective in reducing anxiety. (The PRV effect size estimate was small and negative in this case.) Both promotion focus ($\gamma = 0.47$, $SE = 0.21$, $p = .034$, PRV = negative) and prevention focus ($\gamma = 0.66$, $SE = 0.28$, $p = .022$, PRV = 24.86%) significantly moderated the effect of treatment condition on rates of change (see Table 6). As Figure 6 shows, the patterns resembled the effects of promotion and prevention focus on BDI-II change. For both prevention focus and promotion focus, people low in the trait showed greater improvement in BAI scores in SST compared with CBT. In contrast, people high in the trait showed less or no improvement in SST compared with CBT. No significant main effects or interactions were found for goal disengagement and reengagement.

Table 6

Multilevel Model for Change in Anxiety (BAI) Scores as Moderated by Treatment, Promotion, and Prevention Factors

Fixed effect	Treatment condition model				Condition and promotion focus model				Condition and prevention focus model			
	Estimate	SE	<i>t</i>	<i>p</i>	Estimate	SE	<i>t</i>	<i>p</i>	Estimate	SE	<i>t</i>	<i>p</i>
Intercept	16.24	1.85	8.79	<.001	16.24	1.87	8.70	<.001	16.43	1.80	9.13	<.001
Session: Linear	-0.58	0.14	4.01	<.001	-0.55	0.15	3.67	.001	-0.53	0.16	3.43	.001
Condition	-2.89	2.58	1.12	.268	-2.87	2.58	1.11	.271	-3.53	2.54	1.39	.171
Condition × Session	-0.10	0.23	0.46	.648	-0.13	0.22	0.60	.549	0.06	0.19	0.30	.766
Promotion					-1.47	2.39	0.62	.542				
Promotion × Session					-0.22	0.17	1.35	.185				
Promotion × Treatment					0.79	2.96	0.27	.789				
Promotion × Session × Treatment					0.47	0.21	2.18	.034				
Prevention									-1.22	1.85	0.66	.512
Prevention × Session									-0.12	0.15	0.77	.446
Prevention × Treatment									-0.51	3.19	0.16	.874
Prevention × Session × Treatment									0.66	0.28	2.38	.022

Random effect	Treatment condition model				Condition and promotion focus model				Condition and prevention focus model			
	Variance component	<i>df</i>	χ^2	<i>p</i>	Variance component	<i>df</i>	χ^2	<i>p</i>	Variance component	<i>df</i>	χ^2	<i>p</i>
Intercept (μ_0)	80.13	45	595.41	<.001	83.29	43	401.78	<.001	80.64	43	574.12	<.001
Linear slope (μ_1)	0.45	45	233.16	<.001	0.46	43	280.04	<.001	0.34	43	189.68	<.001
L1: Residual (r_{ij})	20.51				20.52				20.45			

Model fit	Treatment condition model				Condition and promotion focus model				Condition and prevention focus model			
	Deviance	Parameters	AIC	BIC	Deviance	Parameters	AIC	BIC	Deviance	Parameters	AIC	BIC
Index	3,671.89	4	3,679.89	3,697.39	3663.67	4	3,671.08	3,689.17	3657.81	4	3,665.81	3,683.31

Note. $N = 49$ participants (Level 2); $N = 587$ observed sessions (Level 1 [L1]; 16 maximum per participant). Session is coded 0 (first week) to 15 in increments of 1. Condition is coded 0 = cognitive-behavioral therapy, 1 = self-system therapy. Prevention and promotion scores are standardized. BAI = Beck Anxiety Inventory; AIC = Akaike information criterion; BIC = Bayesian information criterion.

Multilevel Model for Change in Anxiety (BAI) Scores as Moderated by Treatment, Promotion, and Prevention Factors

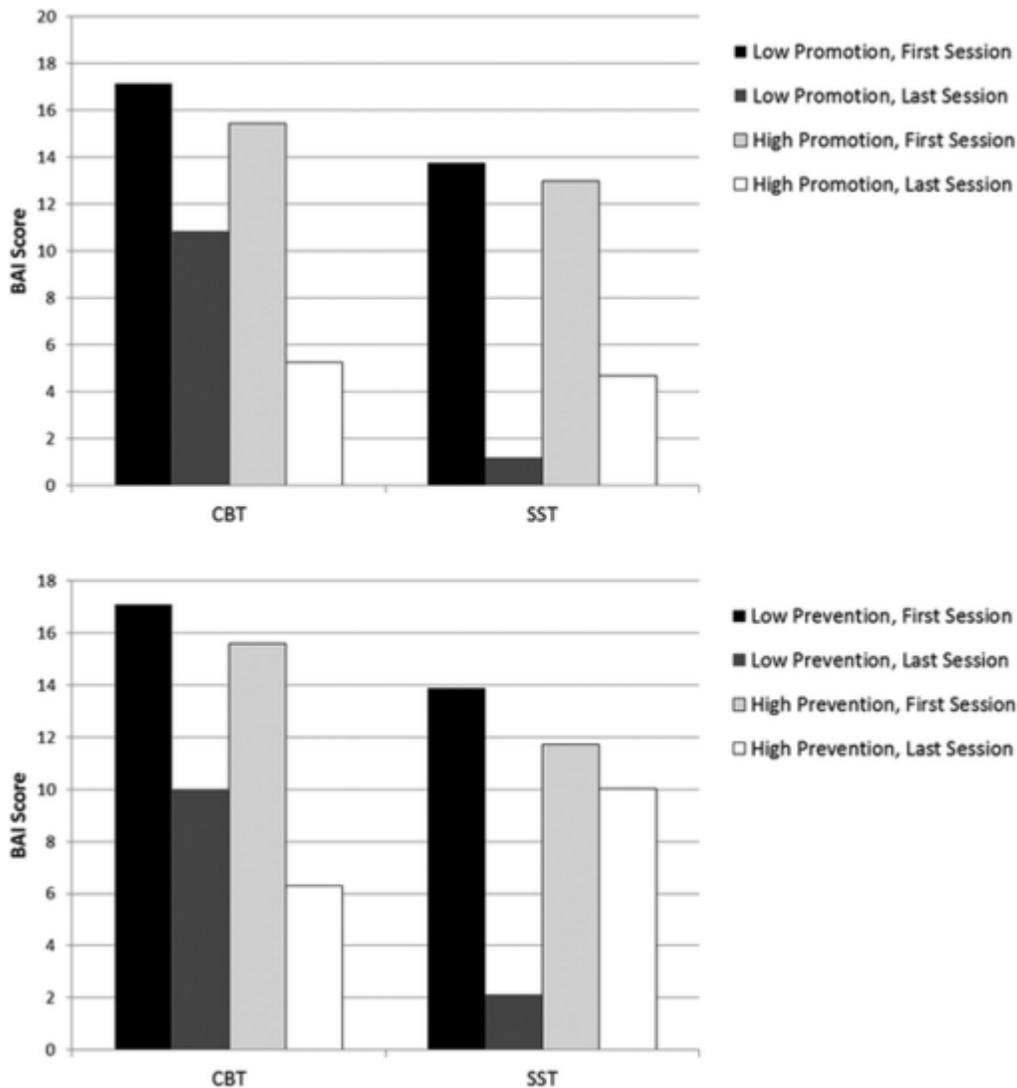


Figure 6. Moderating effects of promotion and prevention orientations on anxiety (Beck Anxiety Inventory [BAI]) change for cognitive-behavioral therapy (CBT) and self-system therapy (SST). The effects are estimated for Sessions 1 and 16 for the 25% and 75% values of promotion and prevention focus.

Dropout and Length of Participation

Our final analyses explored predictors of dropout and length of participation. For dropout, each participant was classified as a dropout (0) or completer (1). Most completers attended all 16 sessions, but several were early completers who received a full dose of treatment in fewer than 16 sessions. Decisions to end early were based on a discussion between the therapist and supervisor and were permitted only if a full dose of therapy had been received and stable improvement was evident. Cases in which participants unexpectedly left, even after many therapy sessions, were not considered instances of early completion. Completion rates were similar for CBT (55.6% [15 of 27]) and SST (72.7% [16 of 22]). A logistic regression model did

not find a significant difference between the therapy conditions ($b = .758$, $SE = .616$, $p = .219$, $OR = 2.13$, $OR\ 95\% \text{ CI } [0.64, 7.13]$).

To evaluate the duration of participation in more detail, a Cox regression survival analysis was used to estimate the duration of participation across the 16 sessions (see Corning & Malofeeva, 2004). Treatment condition did not significantly predict durations ($b = -.207$, $SE = .419$, $p = .621$), reflecting similar probabilities of remaining in treatment across sessions for CBT and SST (see Figure 7).

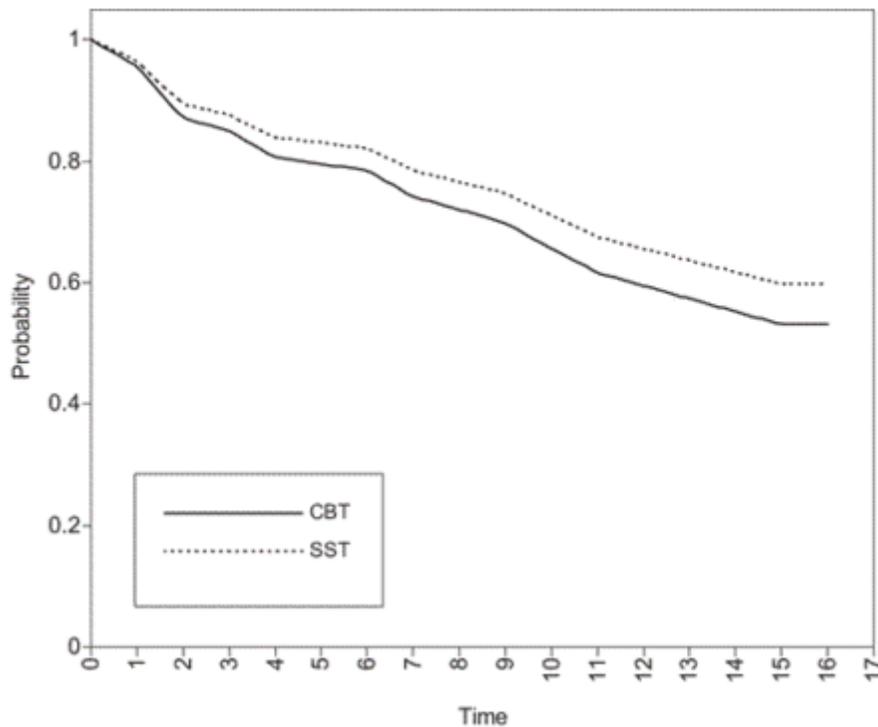


Figure 7. Estimated probabilities of remaining in therapy for the cognitive-behavioral therapy (CBT) and self-system therapy (SST) groups.

Discussion

The primary aims of this study were to examine the efficacy of a brief, 16-session protocol of SST in comparison with CBT treatment in a sample of moderately to severely depressed adults and to replicate and extend previous research suggesting that SST may compensate for the deficits in self-regulation that are associated with depression. In contrast to traditional outcome studies, in which participants are assessed at pre- and posttreatment, the current study examined trajectories of change over time with repeated assessments of symptom severity. The results supported our hypotheses. Regarding overall efficacy, we found that both SST and CBT were effective treatments for depression and did not differ in terms of the rate or magnitude of symptom improvement (depression and anxiety) or in terms of dropout rates. More than half of our sample had a history of 10 or more previous depressive episodes, and nearly a third of the sample had been previously hospitalized for mental health concerns. This independent replication bolsters SST as a viable treatment approach for depression and further suggests that

its efficacy extends to higher levels of depression severity. Further, the successful implementation of SST using relatively novice therapists suggests that the therapy could be feasibly disseminated in real-world treatment settings.

We should note that rates of full recovery, defined by an index of clinically significant change, in both conditions were modest. Roughly half of the participants in each condition had residual symptoms in at least the mild range on terminating treatment. It is difficult to directly compare these results with those of the previous SST trial (Strauman et al., 2006) because slightly different symptom measures and definitions of clinical significance were used and the samples differed in pretreatment severity, but our rates fit with studies of CBT delivered under a similar preceptor supervision model (e.g., Merrill, Tolbert, & Wade, 2003). Given the association between residual posttreatment depressive symptoms and risk for relapse and poor long-term outcomes (e.g., Judd et al., 1998; Kennedy & Paykel, 2004), the proportion of patients who did not achieve full recovery underscores the importance of examining supplemental approaches to prevent relapse and maintain treatment gains.

Although the two treatments were equally effective in decreasing symptoms of depression and anxiety, our results are consistent with Strauman et al. (2006) in that participants with greater self-regulatory dysfunction fared better in SST compared with CBT. Specifically, those who reported less success with promotion-focused means of goal attainment showed greater symptom improvement with SST. Although depression is conceptualized as primarily involving a hypoactive promotion system (Strauman, 2002), we also examined the effects of prevention focus.

In our depressed sample, the two RFQ scales were uncorrelated, consistent with other studies (e.g., Eddington, Majestic, & Silvia, 2012), and higher intake depression (but not anxiety) was associated with lower promotion focus. Items on the prevention scale are distinctly more focused on recalling childhood experiences (regarding responsibilities and compliance with rules). In contrast, promotion items focus on a more current time frame. Exploratory analyses showed that higher prevention focus was associated with better symptom improvement in CBT compared with SST. Results from three studies by Liberman, Molden, Idson, and Higgins (2001) suggested that a stronger prevention focus (assessed using a different measure) was associated with generating fewer alternative hypotheses and explanations in response to laboratory tasks. Thus, one possible explanation for this finding may be that patients with a stronger prevention focus may struggle with cognitions (e.g., catastrophizing, worrying) that underlie efforts to keep bad things from happening. CBT's focus on cognitive restructuring and generating alternative explanations may be more effective for these patients, leading to greater symptom improvement. Although replication of these results is warranted, an interesting next step in this work would be to determine whether promotion and prevention focus could be used in a treatment-matching context with SST and CBT.

Our second measure of self-regulatory dysfunction was goal adjustment, the ability to flexibly respond to problems in goal pursuit by disengaging from unsuccessful goals and reengaging in new ones. Our results showed that people with difficulties reengaging in new goals when progress is stalled showed greater improvement in SST compared with CBT. Individual differences in disengagement, however, had no differential impact on treatment outcome. These

findings likely reflect the primary focus in SST: encouraging patients to identify and make progress toward new, promotion-focused goals. Although helping patients let go of unattainable goals may be a useful self-regulatory intervention, depressed patients often have already given up on many of their personal goals (adaptively or not), making it a less prominent feature of the treatment. In a large sample of college students, Eddington (2014) found mean scores on the GAS-D and GAS-R of 9.7 (SD = 3.0) and 21.7 (SD = 3.7), respectively. In the current clinical sample, GAS-D scores were somewhat higher and GAS-R scores somewhat lower. The higher GAS-D scores in the current sample raise questions about whether goal disengagement, originally viewed as an adaptive aspect of self-regulation, may become more akin to anhedonia or premature giving up in the context of depression. Given the importance of goal adjustment in the dynamic process of self-regulation, future research should examine the possibility of both adaptive and maladaptive components of goal disengagement and reengagement, perhaps through the development of more comprehensive measures of these constructs.

A limitation of this study is the reliance on patients' self-reported symptoms. Although we used one of the most common measures of depressive symptom severity, the BDI-II, which enables easy comparison with other studies, concerns about the validity of frequent (weekly) administrations of the BDI-II—at least in nonclinical populations—have been noted (Longwell & Truax, 2005). Weekly clinician evaluations of symptoms would be helpful in this regard, but feasibility is a major concern given that such evaluations would have to be performed by blind assessors. A second limitation concerns the generalizability of the results given that our sample was somewhat restricted in terms of education level and gender. A high proportion of female participants is not uncommon in depression treatment studies (Hollon et al., 1992; Merrill et al., 2003), but the effectiveness of SST for patients with less education remains to be examined.

In summary, this study has shown that SST is an effective treatment for depression, particularly for those patients whose depression prominently features problems in self-regulation, suggesting that matching patients to treatment on the basis of self-regulatory features may enhance outcomes. The developers of SST maintain that the treatment is flexible—guided primarily by a set of core principles and overarching treatment goals related to basic theoretical and empirical work on self-regulation (Vieth et al., 2003). This integrative approach to treatment development is a much-needed shift in the field and parallels recent developments in the transdiagnostic conceptualization of psychopathology and treatment (e.g., Barlow, Allen, & Choate, 2004). Our data further suggest that SST was equally effective in reducing symptoms of depression and anxiety, suggesting that it may lead to the development of skills that are useful for a broader range of presenting problems. Although this study proposes that patients with self-regulatory deficits gained skills in SST to compensate for those deficits, this assertion was not directly tested.

A next important step in this line of research is to determine the extent to which the mechanisms of action underlying SST are different from those in other treatment approaches. Although the two treatments were clearly distinguishable in the behaviors of the therapists delivering them, adherence data do not necessarily demonstrate differential mechanisms of action. More direct measurement of outcomes related to the treatment targets (i.e., cognitions in CBT and goal pursuit in SST), rather than symptoms per se, over the course of therapy are necessary to address that issue. In addition, studies that examine changes in neural processing of treatment-relevant

material (e.g., changes in goal responsiveness) with therapy would be a useful next step in ascertaining differential mechanisms of change.

Footnotes

1. Due to unequal variances between conditions, adjusted degrees of freedom were used in all three mean comparisons. CFs scale scores are generally expected to be higher because, in addition to having more items, more of those items tap into therapist behaviors that occur throughout the course of therapy (e.g., collaboration, setting the session focus). In contrast, more of the SST and CBT items tap into specific strategies that may occur only in a certain phase of therapy (e.g., discussing the distinction between promotion and prevention in SST).
2. Specifically, treatment condition, promotion focus, goal disengagement, and goal reengagement had no significant main effects or interactions involving the quadratic component. The only significant effects were a main effect of prevention focus and a Prevention \times Condition interaction for the quadratic component. The effect size of treatment condition on the quadratic component was small and negative.

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