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BIBLIOTHERAPY FOR DEPRESSION: EVALUATING COGNITIVE BEHAVIORAL
THERAPY AND ACCEPTANCE AND COMMITMENT THERAPY
APPROACHES AND EXAMINING THE ROLE OF
CLIENT CHOICE

by

Carter H. Davis

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

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2021

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ABSTRACT

Bibliotherapy for Depression: Evaluating Cognitive Behavioral Therapy and Acceptance and Commitment Therapy Approaches and Examining the Role of Client Choice

by

Carter H. Davis

Utah State University, 2021

Major Professor: Michael E. Levin, Ph.D.

Department: Psychology

Depression is a significant mental health concern among college students, who are additionally likely to suffer from co-occurring issues such as anxiety and depression-related stigma. Adding to these challenges is an overburdening of counseling centers, which struggle to effectively reach the large numbers of students struggling with depression. While several evidence-based self-help treatments for depression exist, they are generally understudied, as are effective ways of helping students to engage in these interventions over time. This study examined the feasibility of one such means of disseminating care to students, online bibliotherapy, while also comparing two common treatment approaches: Acceptance and Commitment Therapy (ACT) and traditional

cognitive behavioral therapy (CBT). We additionally tested the impact that providing a choice of treatment had on outcomes and adherence to interventions.

A sample of 142 college students with elevated symptoms of depression was recruited for this study. Participants were randomized to use either an ACT or CBT self-help book over 10 weeks, or chose themselves which book to use after reading a brief description. All participants completed baseline, midtreatment, and posttreatment surveys, as well as a 3-month follow-up assessment. Variables measured included depression, anxiety, depression-related stigma, and theorized processes of change, as well as questions regarding satisfaction and adherence to the self-help books.

Overall, students were satisfied with both self-help books and indicated their usefulness in managing depression, though many indicated that having an option for print copies of books would have been preferable. Retention in the study was generally low, with over half of students dropping out by posttreatment. Generally, students saw significant reductions over time in depression, anxiety, and depression-related stigma. A significant portion of students entered the study with severe levels of depression symptomatology, and by posttreatment a majority of students were classified as either recovered or recovering from depression. Students who read the ACT book saw slightly greater improvements in depression over time, in addition to greater reductions in cognitive fusion, a relevant mechanism of change in ACT. Contrary to our predictions, students who were randomized to a book instead of selecting it themselves showed greater improvements in both depression and anxiety, as well as several process measures. Changes in therapeutic processes during treatment were overall more predictive of depression-related stigma than for depression and anxiety outcomes.

Our findings indicate the broad effectiveness of both ACT and CBT-based online bibliotherapy for depressed college students. Additionally, our results suggest that ACT may be especially useful in targeting cognitive fusion in students, and that this construct and other therapeutic processes may be particularly relevant for addressing depression-related stigma among students. At the same time, the low rates of adherence we observed, as well as significant levels of dropout, point to the ongoing challenges in engaging this population in treatment. Furthermore, the unexpected effects of client choice in our study invite further investigation. While online bibliotherapy is broadly effective in reducing depression among college students, future work should focus on how to effectively engage students in treatment long term.

(76 pages)

PUBLIC ABSTRACT

Bibliotherapy for Depression: Evaluating Cognitive Behavioral Therapy and Acceptance and Commitment Therapy Approaches and Examining the Role of Client Choice

Carter H. Davis

An alarming number of college students suffer from depression, which is often accompanied by struggles with anxiety and feeling inadequate compared to others (i.e., stigma). Seeing a counselor in person is challenging for many students due to wait times or feeling embarrassed or shameful. Using self-help books may be a helpful alternative for depressed students, but these books are not often tested in formal studies, and getting students to use self-help books over time is also difficult. Therefore, this study examined whether self-help books accessed online could help students with depression. We tested two books which use different approaches to treating depression: Acceptance and Commitment Therapy (ACT) and traditional cognitive behavioral therapy (CBT). While some students were randomly given one of these two books, we also allowed some students to choose themselves which book they wanted to use, since we believed this may help students feel more invested in the treatment and use the book more consistently over time.

We enrolled 142 students in our study, who all read a self-help book over 10 weeks, while completing online surveys that asked about depression, anxiety, and depression-related stigma. We also asked students questions about how they look at their

thoughts and feelings, since changes in these perspectives are often related to positive outcomes. Overall, students were satisfied with the book they used, however over half of them dropped out of the study by the 10-week mark. Over the course of the study, rates of depression, anxiety, and depression-related stigma lowered. There were only small differences in outcomes based on which book a student used. However, we found that students who were randomized to a book improved more than students who chose a book, and also read more of their book, which contradicted our predictions.

Our results suggest that distributing online self-help books to college students can help them in managing their depression. The finding that allowing students a choice of book did not lead to them using it more, and in fact led to worse outcomes compared to the students who randomly received a book, suggests that simply providing students with a viable self-help book may be more important than incorporating their individual preferences. Given that we struggled to keep students engaged in our study over time, future research should look into other ways of promoting adherence to self-help treatments for depression.

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CHAPTER I

INTRODUCTION

College students comprise a diverse population, and one that is markedly at-risk for experiencing mental health issues such as depression. While depression is a notable issue on a global scale and has recently been identified as the leading cause of disability worldwide (World Health Organization, 2017), college students face a particularly high risk of developing depression. In addition to the trend that depression often emerges during early adulthood, contextual factors associated with attending college such as relocation or academic pressure may increase the likelihood of developing depressive symptoms. In a recent survey of over 50,000 students across 75 colleges and universities in the United States, approximately 22% reported a lifetime diagnosis of a depressive disorder (American College Health Association, 2019). Additionally, research suggests that depression-related issues among college students are persistent and severe, with undergraduate samples reporting 11% of students having severe or extremely severe symptoms (Beiter et al., 2015), and approximately a quarter of students meeting criteria for suicide risk (ACHA, 2019). Pointing to the severity of depression among college students, research also suggests that both psychiatric hospitalization and non-suicidal self-injurious behavior occur at higher rates for students than the general population (Pennsylvania State University, 2015). College students are at greater risk for comorbid psychiatric and substance use disorders as well, with alcohol use disorder being especially prevalent compared to non college-attending young adults (Blanco et al., 2008). Psychosocial stressors such as pressure to succeed academically, financial-related distress, and interpersonal problems are likewise prevalent among college students

(Beiter et al., 2015) and may serve as additional risk factors for depression. Importantly, almost a quarter of students surveyed in a recent poll endorsed depression as having a negative impact on their academic performance (ACHA, 2019).

The prevalence of depression among college students is reflected in their help-seeking behavior, with an estimated 30% of students receiving mental health services in a recent year (ACHA, 2019), representing an overall trend of increasing service utilization. A recent survey of counseling center directors (Association for University and College Counseling Center Directors, 2019) indicates an average of one counselor position per 1,064 students at colleges, a discrepancy that often forces counseling centers to place students on a waitlist or limit the number of therapy sessions they can receive. According to the same survey, students waited an average of 6.1 days for an initial meeting with a counselor, with a maximum wait of 54 days. Additionally, nearly half of colleges report a limit on the number of counseling sessions, with an average limit of 12 appointments per year. This high demand for psychological services on campuses, and the limitations of counseling centers in meeting increased utilization by students, highlights the need for supplemental mental health services.

An additional burden commonly faced by students seeking traditional forms of depression treatment (i.e. face-to-face therapy) is stigma. While stigmatizing attitudes about depression may be transmitted by societies at large, self-stigma, or persistent negative beliefs directed towards oneself, was recently shown to be prevalent among college students in a large international sample (Vogel et al., 2017). Additionally, a recent review found an overall trend of self-stigma for depression reducing the likelihood that students accessed mental health services (Guarneri et al., 2019). Individuals with

depression may experience a sense of shame in feeling inadequate as compared to peers, thus leaving individuals unsure of whether to disclose a condition that may be invisible to others though is causing a marked degree of pain to themselves (Barney, Griffiths, Christensen, & Jorm, 2010). Certain subsets of college students, such as males or students from international backgrounds, are even more likely to experience self-stigmatizing attitudes that reduce the likelihood of treatment-seeking (Eisenberg et al., 2009). Therefore, it is important to provide treatment options for depression which address both logistical challenges to accessing care for students in addition to the role of self-stigmatizing attitudes.

One potentially viable solution for addressing these barriers is online self-help. Online self-help provides a means of delivering treatment that is convenient and does not rely on counseling center availability. Additionally, self-help affords clients greater privacy than when presenting to a counseling center, potentially lessening the impact of stigma associated with seeking treatment for depression (Levin et al., 2018). A number of therapeutic modalities have been adapted to an online format, with popular choices being Acceptance and Commitment Therapy (ACT; Hayes et al., 2011) and traditional cognitive behavioral therapy (CBT). Customized online ACT and CBT programs have been shown effective in treating depression among college students (Räsänen et al., 2016; Richards et al., 2016), and a comparison study found an online CBT format as acceptable as a therapist-delivered one (Richards & Timulak, 2012).

There are drawbacks to creating full online self-help interventions, however, including typically high development and implementation costs. An alternative to building customized self-help programs is to use online bibliotherapy, or the

dissemination of existing self-help books through a digital format. Many college campuses possess a viable means of distributing online bibliotherapy through library systems, with data suggesting that 64.6% of students and teachers are already using eBooks as part of their academic studies (Ashcroft, 2011). ACT-based bibliotherapy has been shown effective for a variety of clinical concerns, including anxiety (Krafft et al., 2020; Ritzert et al., 2016; Serowik et al., 2020) general distress (Muto et al., 2011), though its application to depression specifically, and within student populations, is understudied. A recent systematic review found overall effectiveness for CBT-based bibliotherapy among adults, but inconclusive results in college-aged samples (Gualano et al., 2017). Online bibliotherapy thus provides an option for treating depression on campuses that addresses barriers associated with in-person care such as wait times and stigma, while additionally providing an opportunity to compare common interventions such as ACT and CBT.

While offering online bibliotherapy to students may increase accessibility of care for depression, a persistent issue in self-help approaches is a high rate of treatment dropout (Karyotaki et al., 2015). A meta-analysis of online self-help for depression found that 74% of participants in trials of unguided self-help for depression did not fully complete treatment (Richards & Richardson, 2012). While findings from the same meta-analysis indicated that adding therapist support increased adherence, this approach may not always be feasible, especially on college campuses where therapists are already overburdened.

One potential way of promoting adherence to interventions may be allowing clients a greater degree of choice over the treatment they receive. In the context of in-

person psychotherapy, incorporating client preferences is emphasized as a core component of the “three-legged stool” of evidence-based practice (Kirk et al., 2016), and has been shown to promote a sense of autonomy and empowerment for clients (Tompkins et al., 2013). There is a notable lack of empirical research on the effect of client choice on self-help outcomes, however, with just one study suggesting that allowing clients to select certain modules within a CBT intervention produces similar clinical results to those who completed a prescribed set of modules (Andersson et al., 2011). In the area of self-help, not only is there a lack of empirical research into specific treatments (Rosen & Lilienfeld, 2016), but little understanding of the role of client preferences in treatment outcomes. Examining the effects of choice in online bibliotherapy offers a step towards clarifying many of these issues, while additionally aiming to improve access to care for a population with a significant mental health burden.

The present study therefore sought to test the efficacy of ACT and CBT online bibliotherapy for depressed college students while examining the role of choice of intervention on outcomes and adherence. We additionally tested whether changes in hypothesized mechanisms of change for each treatment predicted outcomes, such as psychological flexibility in ACT and cognitive reappraisal in CBT. Prior research suggests that mechanisms of change in ACT self-help interventions for college students are predictive of outcomes (Räsänen et al., 2020) and further study is needed to determine whether these processes are distinct from traditional CBT approaches. Participants were recruited at a large public university in the Western United States, with students accessing the interventions through an online university library system. We predicted that 1) students receiving either intervention would report improvements in depression,

anxiety, and depression-related self-stigma, 2) having a choice of book would improve adherence to intervention, and 3) changes in relevant theoretical processes would predict changes in outcome measures for each intervention.

CHAPTER II

METHODS

Participants

A sample of 142 students were recruited who met the following inclusion criteria: 1) 18 years of age or older, 2) being a current student at the authors' university, 3) not having participated in previous self-help studies conducted by the authors, 4) being interested in testing a self-help book for depression, and 5) scoring at least a 10 on the depression subscale of the Depression, Anxiety, and Stress Scale-21 Item (DASS-21), which is the cutoff for moderate depression (Lovibond & Lovibond, 1995). Participants were recruited through an online university research study pool, advertisements on an online student portal, community flyers, class announcements, and referrals from campus providers. Students had the option to receive research participation credits for joining the study. Recruitment took place over 13 months from January 2019 through February 2020. Three participants were removed who self-identified as randomly responding to half or more of survey questions, leaving a final sample of 139 students for analysis (see Figure 1 for participant flowchart).

Regarding demographics, students were largely young ($M = 23.3$ years, $SD = 6.3$) and 78.4% identified as female, compared to 20.1% male and 1.4% other gender identity. The sample was largely white (92.8%), with 3.6% identifying as multiracial, 1.4% each identifying as American Indian/Alaskan Native or Native Hawaiian/other Pacific Islander, and 0.7% identifying as Black, as well as 8.6% of students additionally identifying as Hispanic or Latinx. A majority of students (77.7%) reported attending classes in-person at the main university campus, with 8.6% of students attending a

regional campus and 13% of students reporting attending classes partially or fully online. The median household income for the whole sample was \$40,000-\$60,000. Regarding treatment utilization at baseline, 48.8% of students reported receiving psychiatric medications and 17.3% of students reported seeing a therapist during the month prior to beginning the study. See Table 1 for a comparison of demographic variables by treatment condition. No significant demographic differences were detected between conditions (all $ps > .10$) using one-way ANOVA and chi square tests.

Procedures

The study was preregistered through ClinicalTrials.gov (NCT03796143). All study procedures were completed online. After completing informed consent, students completed a screening questionnaire to determine study eligibility. Eligible students immediately completed a baseline assessment following screening. All assessments were conducted via a secure online platform, Qualtrics. Following baseline, participants were automatically randomized to one of three initial groups: an ACT book, a CBT book, or a choice between the two books. Students in the choice condition were subsequently presented with a brief description of each book (Figure 2) and were asked to select one to use for the study. Thus, four groups of students were ultimately created: ACT-Randomized, ACT-Choice, CBT-Randomized, and CBT-Choice. After either being randomized to or choosing a self-help book, students received a link to access their book online through the university library as well as a 10-week reading schedule which encouraged students to read 1-2 new chapters each week. Students were asked to not use other self-help resources besides their assigned book during the 10-week intervention

period. Both books contained worksheets and suggestions for weekly exercises for practicing coping skills.

The Mindfulness and Acceptance Workbook for Depression: Using Acceptance and Commitment Therapy to Move Through Depression and Create a Life Worth Living (Strosahl & Robinson, 2008) is an ACT-based approach to managing depression. The book introduces the overarching perspective that letting go of strategies to control depressive thoughts and emotions can allow for more meaningful participation in life. The book teaches skills in the central ACT areas of values clarification, acceptance and defusion strategies, mindfulness practice, and setting and committing to behavioral goals. Additionally, an emphasis is placed on “rewriting” the inflexible life narratives that often accompany depression, i.e. learning to view depressive self-evaluations as products of social and contextual factors while increasing awareness of direct and changing emotional experiences.

The Cognitive Behavioral Workbook for Depression: A Step-by-Step Guide to Overcoming Depression (Knaus, 2006) uses a traditional cognitive-behavioral approach for the treatment of depression. The book introduces the CBT model of depression, which promotes an awareness of the relationship between depressive thoughts, feelings, and sensations. Strategies are introduced to help build this awareness including identifying depressive thought patterns, separating sensations from appraisals, cognitive restructuring, using metacognition/logic, and avoiding mental “traps” such as perfectionism, hopelessness, and self-blame.

Students were sent a midtreatment survey 5 weeks after baseline, a posttreatment assessment 10 weeks after baseline, and a final follow-up survey 3 months following

posttreatment (22 weeks after baseline). Researcher contact involved biweekly emails to complete assigned readings in addition to a check-in email sent one week following baseline asking students about any barriers to using the book. Overall, a minority of students replied to this troubleshooting message (20.4%). If a student indicated they were having difficulties adhering to the program, the researcher responded by reinforcing any progress made so far, normalizing and validating any reported challenges in engaging in a new program (e.g. burden of coursework), and offered basic strategies to promote adherence (e.g. setting reminders on their smartphone to read assigned chapters). Additional troubleshooting help was provided to students as needed throughout the study, such as any difficulties in accessing the online book. To promote adherence to study assessments, researchers used up to three email and two phone reminders at each timepoint.

Measures

Adherence. Participants were asked at midtreatment and posttreatment which of the assigned chapters they read. Using this information, participants were categorized as treatment completers or non-completers, defined as reported having read at least 75% of assigned chapters in their book. Participants were also asked to rate their adherence to the exercises in the book on a 7-point scale from “Did all recommended assignments” to “Did no recommended assignments” at both midtreatment and posttreatment. This assessment is adapted from previous studies of self-help adherence (Abramowitz et al., 2009).

Satisfaction. At posttreatment, participants were asked to rate 14 items evaluating their satisfaction with the self-help book on a 6-point scale from “Strongly disagree” to “Strongly agree.” These items have been used to evaluate program satisfaction in previous online bibliotherapy studies (Krafft et al., 2020; Levin et al., 2020).

Depression, Anxiety, and Stress Scale (Lovibond & Lovibond, 1995). The DASS is a 21-item scale of psychological health. The depression subscale was used as the primary outcome measure and has been found to be reliable and valid for the assessment of depressive symptomatology (Beaufort et al., 2017; Henry & Crawford, 2005). The anxiety subscale was used as a secondary outcome measure for this study. On all subscales, items are rated from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”), with higher scores suggesting higher symptom severity. The DASS has been found to be a reliable and valid measure in previous research (Lovibond & Lovibond, 1995), and has additionally been shown to be sensitive in detecting ACT treatment effects in self-help interventions (Levin et al., 2014; Viskovich & Pakenham, 2020). Internal consistency was good to excellent in this sample (Cronbach’s $\alpha = .93$ for depression, $.83$ for anxiety, and $.81$ for stress).

Self-Stigma of Depression Scale (Barney et al., 2010). The SSDS is a 16-item measure of self-stigma related to depression and includes subscales of shame, self-blame, social inadequacy, and help-seeking inhibition, in addition to a total score of overall self-stigma which we report in this study. The scale has shown good reliability and validity, including results indicating that self-stigma of depression is distinct from perceptions of stigma by others (Barney et al., 2010). We made an error, consistent across all timepoints, in transcribing the measure online with a seven-point Likert scale ranging

from 1 (“Strongly agree”) to 7 (“Strongly disagree”), instead of the published 1 to 5 scale. Therefore, total SSDS scores range from 16 to 112 as opposed to 16 to 80, with higher scores indicating higher depression-related self-stigma. Despite our transcription error, internal consistency was good to excellent in this sample ($\alpha = .93$ for total stigma, .86 for shame, .80 for self-blame, .81 for social inadequacy, and .84 for help-seeking inhibition).

Acceptance and Action Questionnaire-II (Bond et al., 2011). The AAQ-II is a 10-item measure of psychological inflexibility, a primary treatment target of ACT. Items are rated on a 7-point scale ranging from 1 (“Never true”) to 7 (“Always true”) with higher scores suggesting higher psychological inflexibility. The AAQ-II is reliable and valid (Bond et al., 2011), and has previously been shown sensitive to online ACT treatments (Levin et al., 2017). Internal consistency was good in this sample ($\alpha = .87$).

Cognitive Fusion Questionnaire (Gillanders et al., 2014) The CFQ is a 7-item measure of cognitive fusion, which is theorized as a key process in treatments utilizing ACT. It has good reliability and validity among college students (Gillanders et al., 2014), and has been identified as a predictor of longitudinal outcomes in student mental health, including depression (Krafft et al., 2019). Internal consistency in this sample was excellent ($\alpha = .93$).

Behavioral Activation for Depression Scale (Kanter et al., 2007). The BADS is a 25-item measure of approach and avoidance behaviors in depression, separated into two subscales. Two additional subscales measure work/school and social impairment due to depressive symptoms. Behavioral activation is considered an important treatment target in depression and has been shown to mediate outcomes in self-help interventions (van

Luenen et al., 2019). We reported results on the BADS according to the total score.

Reliability was adequate to good in this sample ($\alpha = .89$ for total behavioral activation, $\alpha = .89$ for approach, $\alpha = .81$ for avoidance, $\alpha = .79$ for work impairment, and $\alpha = .85$ for social impairment).

Automatic Thoughts Questionnaire-Frequency (Hollon & Kendall, 1980). The ATQ is a 30-item measure of the frequency of automatic negative self-statements associated with depression. Automatic thinking as measured by the ATQ is an essential treatment target from a CBT perspective. The ATQ has shown good reliability and validity (Hollon & Kendall, 1980), and has been shown to predict depressive symptoms in college students (Buschmann et al., 2018). We used the frequency subscale of the ATQ to assess how often negative automatic thoughts occurred (e.g. “what’s wrong with me?”), with higher scores suggesting more frequent automatic thoughts. Internal consistency was excellent in this sample ($\alpha = .97$).

Thought Control Questionnaire-Reappraisal Subscale (Wells & Davies, 1994). The TCQ-Reappraisal subscale is 6-item measure of cognitive reappraisal of negative thoughts. Cognitive reappraisal, or the process of changing subjective evaluations of negative emotions, has been identified as an important component of cognitive therapy for depression (Dryman et al., 2018). The TCQ has shown good reliability and validity in depressed samples (Reynolds & Wells, 1999), although internal consistency was marginal in this sample ($\alpha = .67$).

CHAPTER III

RESULTS

Preliminary Results

All analyses were conducted in R (R Core Team, 2015). Potential differences in baseline variables, including age, gender identity, race, ethnicity, median income, therapy/medication utilization, as well as all outcome and process variables, were compared between the four groups using chi-square and one-way ANOVA tests. No significant differences were detected between baseline variables (all $ps > .05$, see Table 1). All outcome and process variables were assessed for skewness/kurtosis at each timepoint, with all variables approximating normality without requiring transformation.

Missing Data

Overall, 51.8% of students completed the midtreatment assessment, 44.6% completed posttreatment, and 49.6% completed the follow-up assessment (see Figure 1). There were no significant differences in attrition between the four groups (ACT-Randomized, ACT-Choice, CBT-Randomized, CBT-Choice) according to chi-square tests ($p = .93$ for midtreatment, $p = .82$ for posttreatment, and $p = .06$ for follow-up), suggesting that missing data occurred at random irrespective of group membership. Given the notable amount of missing data in the sample, and that listwise deletion would therefore be inappropriate, maximum likelihood was used for all parameter estimates in our multilevel models. This approach to missing data uses an iterative method to test various parameter estimates by imposing distributional assumptions on incomplete

variables until finding a set of parameters which maximizes the likelihood function (Grund et al., 2019). Importantly, the maximum likelihood approach allows for accurate modeling using each available datapoint even when particular observations at the individual level are missing, whereas a listwise deletion method would exclude the entire case from analysis (Enders & Bandalos, 2001). Furthermore, maximum likelihood allows for accurate model estimations even when handling levels of missingness as high as 75% (Newman, 2003).

Book Preferences

Data from participants in the choice condition ($n = 47$) were assessed to understand potential differences in subgroups based on chosen book, as well as trends in preferences between the two interventions. In the choice group, 29 students selected the ACT book (61.7%), while 18 selected CBT (38.3%). According to chi-square tests, there were no significant differences in demographic factors and treatment history between students choosing ACT versus CBT (i.e. age, gender identity, race/ethnicity, and therapy/medication use were not predictors of choosing a particular book; all $ps > .10$).

The two most common reasons that students indicated for choosing a particular book were “I like the particular approach the book uses” and “I thought it would be more helpful” (see Table 2). Notably, all students indicated that their preference for selecting their book over the other was either “very much” or “a little” strong, with no students indicating they did not feel strongly about their choice.

Satisfaction and Adherence

Satisfaction and adherence with books was assessed in several ways. First, results of the satisfaction survey were compared across all four groups (see Table 3). Reported satisfaction and helpfulness of books were generally high, with mean responses to the statements “Overall, I was satisfied with the quality of the book” and “The book was helpful to me,” ranging from 4.5-4.9, with a 4 indicating “slightly agree” and a 5 indicating “mostly agree.” Results additionally indicated that participants felt the self-help books were relevant to college student issues, with mean responses to the statement “I think the book would be helpful for college students with depression” ranging from 4.8-5.1 across groups. The item with the lowest overall responses was “I preferred using the library website to read the book online, rather than reading a printed copy,” with mean responses falling between the anchor points “mostly disagree” and “slightly disagree” (2.6-3.1). See Table 3 for full results of each satisfaction item. No mean responses for any of the 14 items differed significantly across the four groups according to one-way ANOVA tests (all $ps > .10$), suggesting that participants were not more satisfied with the CBT versus ACT book or when the book was chosen versus randomly assigned.

Adherence to interventions was examined by comparing participants’ self-reported percentage of chapters read as well as compliance with exercises in the self-help books. These results are presented in Table 4 and divided between the four treatment groups. Significant differences were detected between groups for mean percentage of chapters read ($p = .005$) as well as rates of treatment completion ($p = .027$) in a one-way ANOVA and chi square test, respectively. Results suggested students in the choice condition read fewer chapters than those who were randomized to a book. Compliance

with exercises in each book was generally low, with mean values ranging from 2.8 to 3.7 across groups, suggesting that students largely fell between completing “some” to “about half” of exercises in their book. However, no significant differences were detected in exercise adherence between the four groups ($p = .46$).

To further test the effects of book and assignment method on adherence, treatment completion (i.e. read 75% or more of assigned chapters) was considered a binary outcome variable in a series of logistic regression models (see Table 5), which were calculated using the glm package in R (R Core Team, 2015). First, separate unadjusted models were created specifying only book or assignment method as a predictor of treatment completion (binary coded as 0 for non-completer and 1 for completer). A third model was then created which adjusted for both book and assignment method. Table 5 presents both unadjusted and adjusted odds ratios for intervention and assignment method predicting the odds that a participant completed their intervention. In both the unadjusted and adjusted models, assignment method was a significant predictor of treatment completion, with having a choice of intervention leading to a 79-80% reduction in odds of completing the self-help book, compared to being randomized (ORs = 0.21, 0.20; $ps < .05$). Intervention was not a significant predictor of treatment completion in either the adjusted or unadjusted models (all $ps > .05$).

Outcome Analyses

Outcomes analyzed included depression, anxiety, and depression-related stigma. Descriptive statistics of outcome variables at each timepoint are presented in Table 6. Graphs of outcomes over time by book and assignment method are additionally presented

in Figures 3-5. To test the effect of book and assignment method (i.e. randomized or chose book) on outcomes, a series of mixed-effects models was used for each outcome with the full intent-to-treat sample, using the maximum likelihood method for handling missing data as described above. Since outcomes were measured at four timepoints, each model included a random intercept at the participant level to account for individual-level variation on outcomes, as well as random slopes to account for individual-level variation in the slopes of outcome variables over time. To assess predictors of outcome variables, each model included main effects for time, book, and assignment method, in addition to two-way interactions of time by book and time by assignment method. Finally, we tested a three-way interaction between time, book, and assignment method to determine if assignment method moderated the relationship between time and book. All models predicting outcomes were created with the `lmer()` function in R (Kuznetsova et al., 2017), which assesses statistical significance of covariates using Satterthwaite approximations. To allow for interpretation across different scales and estimate effect sizes, regression coefficients for outcome variables were standardized.

Significant main effects for time were found for each of the three outcome variables, with depression, anxiety, and depression-related stigma decreasing on average by 0.46, 0.41, and 0.39 standard deviations per timepoint, respectively (see Table 7). The two-way interaction of time by book was significant for the primary outcome of depression, such that students reading the ACT book saw reductions in depression 0.19 standard deviations more per timepoint compared to those reading the CBT book ($p = .04$). This interaction was further examined in post hoc tests, which indicated large within-group effect sizes for both the ACT book ($d = -1.09$, 95% CI [-1.52, -.66]) and

CBT book ($d = -1.06$, 95% CI [-1.54, -.58]) over the intervention period. Both groups saw negligible effect sizes between posttreatment and follow-up ($ds = .01-.15$). Between-group tests indicated negligible effect sizes between ACT and CBT at both posttreatment ($d = -.09$, 95% CI [-.44, .26]) and follow-up ($d = -.12$, 95% CI [-.57, .33]). The interaction of time by book was not significant for either anxiety or depression-related stigma ($ps > .05$).

The two-way interaction of time and assignment method was found to be significant for both depression and anxiety, predicting that depression decreased 0.20 standard deviations more ($p = .052$), and anxiety decreased 0.24 standard deviations more per timepoint ($p = .035$) for students who were randomized to a book compared to those who chose. Post hoc tests indicated large within-group effect sizes for depression in both randomized students ($d = -1.07$, 95% CI [-1.48, -.68]) and those who chose a book ($d = -1.07$, 95% CI [-1.62, -.52]) during the intervention period. In both groups, effect sizes between post and follow-up were negligible ($d = .02$ for both randomized and choice). As for anxiety outcomes, a large effect size was seen during treatment ($d = -.95$, 95% CI [-1.34, -.55]), and a negligible effect between post and follow-up ($d = -.07$, 95% CI [-.50, .37]) for randomized students. Students who chose a book saw medium effects during treatment for decreased anxiety ($d = -.77$, 95% CI [-1.31, -.24]), with a small effect between post and follow-up indicating increased anxiety ($d = .20$, 95% CI [-.38, .79]). Assignment method was not a significant predictor of changes in depression-related stigma over time ($p = .45$).

The three-way interaction of time, book, and assignment method was significant for depression, such that when participants had a choice of treatment, the CBT book

produced greater improvements over time, with the ACT book performing better for those who were randomized ($p = .036$). Post hoc tests revealed that students who chose the CBT book saw a large between-group effect during treatment ($d = -1.30$, 95% CI [-2.30, -.31]), as did students who chose ACT ($d = -.94$, 95% CI [-1.62, -.27]). A small effect size suggesting increased depression between post and follow-up was detected for students who chose ACT ($d = .26$, 95% CI [-.47, .99]), compared to a negligible effect over the same time period for those who chose CBT ($d = .04$, 95% CI [-1.04, 1.12]). Among randomized students, the ACT group saw a large effect during treatment ($d = -1.18$, 95% CI [-1.75, -.60]), as did the CBT group ($d = -.98$, 95% CI [-1.54, -.42]). From posttreatment to follow-up, students randomized to CBT experienced a negligible effect for depression ($d = .20$, 95% CI [-.40, .79]), whereas those randomized to the ACT book had small effects indicating decreased depression over the same period ($d = -.37$, 95% CI [-1.07, .33]). The three-way interaction of time, book, and assignment method did not significantly predict anxiety or depression-related stigma (all $ps > .05$).

Lastly, rates of clinically reliable change on the main outcome variable of depression were assessed using the classifications determined by Ronk et al. (2013), which established cutoffs for normative patient groups on the DASS-21 depression scale using large nonclinical, outpatient, and inpatient samples. In this approach, respondents are categorized into the following groups based on observed changes between baseline and posttreatment scores: recovered (moved from either outpatient or inpatient into the nonclinical range), recovering (moved from inpatient to outpatient range), improved (made a reliable reduction in severity but did not change patient category), deteriorated (experienced a reliable increase in depression severity), and unchanged (did not make a

reliable change in severity). Rates of clinically reliable change by condition are presented in Table 8. As calculation of change scores is dependent on having both a baseline and posttreatment score, students who dropped out before posttreatment are not included in these statistics. Combining all groups, 37.1% of students were classified as recovered, the most common overall designation, followed by recovering (24.2%). Additionally, recovered was the most common classification within each condition with the exception of the CBT-Choice group, in which unchanged was the most common status. Three students total were categorized as having deteriorated (4.8%), with one each in the ACT-Randomized, ACT-Choice, and CBT-Randomized groups.

Process of Change Analyses

Several steps were taken to analyze processes of change. First, means and standard deviations of process variables were calculated at each timepoint, which are presented in Table 9. To assess theorized change processes, a series of mixed-effects models first examined the effects of book and assignment method on process variables, using the same methods as the analyses of outcome variables (i.e. modeling main effects as well as two- and three-way interactions). Significant main effects for time were found across all process variables, with the exception of cognitive reappraisal (TCQ-R; see Table 10). Overall, psychological inflexibility, cognitive fusion, and frequency of automatic negative thoughts decreased over time, while behavioral activation increased (all $ps < .001$). Estimated changes per timepoint ranged from 0.39 standard deviations for psychological inflexibility to 0.46 standard deviations in frequency of automatic negative thoughts.

The two-way interaction of time by book was significant for the CFQ only, such that students reading the ACT book reduced cognitive fusion by 0.17 standard deviations more than those reading the CBT book ($p = .04$). Post hoc tests revealed large within-group effects during treatment for both ACT ($d = -.95$, 95% CI [-1.38, -.53]) and CBT ($d = -.97$, 95% CI [-1.45, -.48]). Between posttreatment and follow-up, however, effects were negligible for ACT ($d = -.10$, 95% CI [-.59, .39]), while for CBT a small effect indicated increased cognitive fusion ($d = .21$, 95% CI [-.31, .72]). Between-group effects were negligible at both timepoints ($ds = .01-.07$). No other process variables had significant time by book interactions ($ps > .05$).

The two-way interaction of time by assignment method was significant for all process variables except cognitive reappraisal. Students who were randomized to their book had greater reductions in psychological inflexibility, 0.24 standard deviations more per timepoint than the choice group ($p = .007$). Post hoc tests indicated a large within-group effect for psychological flexibility in the randomized group during the intervention period ($d = -1.02$, 95% CI [-1.41, -.62]), compared to a small effect for increased inflexibility over time in students who chose their book ($d = .20$, 95% CI [-.38, .79]). Effects from posttreatment to follow-up were negligible in both groups ($ds = .02-.12$). Between-group contrasts were negligible at posttreatment ($d = .10$, 95% CI [-.29, .48]) and follow-up ($d = -.02$, 95% CI [-.50, .46]).

Cognitive fusion reduced by 0.21 standard deviations more per timepoint in randomized students ($p = .028$), with a large within-group effect size during the treatment period ($d = -1.08$, 95% CI [-1.48, -.69]), compared to a medium effect within the choice group ($d = -.74$, 95% CI [-1.28, -.20]). Effects between post and follow-up were

negligible for both groups ($ds = -.04-.13$). Between-group effect sizes for cognitive fusion were additionally negligible at both timepoints ($ds = .04-.14$).

Randomized students also saw greater increases in behavioral activation, 0.21 standard deviations per timepoint more than students who chose a book ($p = .046$). Effect sizes were large during treatment for both the randomized group ($d = 1.14$, 95% CI [.74, 1.54]) and among students who chose their book ($d = 1.03$, 95% CI [.45, 1.62]). In both groups, effects were negligible between post and follow-up ($ds = -.09-.19$). Between-group effect sizes were negligible at posttreatment ($d = .11$, 95% CI [-.37, .58]), though small at follow-up, favoring randomized students ($d = .21$, 95% CI [-.33, .75]).

Students in the randomized condition additionally experienced greater reductions in frequency of automatic thoughts over time compared to those who chose a book, an average of 0.22 standard deviations less per timepoint ($p = .017$). Within-group effect sizes during treatment were large for randomized students ($d = -1.15$, 95% CI [-1.55, -.74]) and medium for those in the choice condition ($d = -.58$, 95% CI [-1.14, -.01]) with negligible effects from post to follow-up in both groups ($ds = -.09-.10$). Between-group differences were negligible at posttreatment ($d = -.06$, 95% CI [-.41, .30]), and small at follow-up, with lower frequency of automatic thoughts in the randomized group ($d = -.21$, 95% CI [-.66, .23]).

Finally, the three-way interaction of time, book, and assignment method was a significant predictor for both psychological inflexibility and behavioral activation. Similar to the effect on depression, randomization led to greater reductions in psychological inflexibility over time for students reading the ACT book, whereas among those reading the CBT book, having a choice of book produced greater reductions ($p =$

.051). Randomized students reading ACT saw large within-group effects during treatment ($d = -.86$, 95% CI [-1.42, -.30]), whereas students who chose ACT had only small effects over the same period ($d = -.48$, 95% CI [-1.13, .17]). For students using the CBT intervention, being randomized produced large effects during treatment ($d = -1.26$, 95% CI [-1.83, -.68]), with smaller effects for students choosing CBT ($d = -.48$, 95% CI [-1.47, .51]). However, between post and follow-up, students randomized to ACT had small effects for reduced psychological inflexibility ($d = -.39$, 95% CI [-1.09, .32]), while students who chose ACT saw negligible effects ($d = .19$, 95% CI [-.53, .91]). Over the same period for students using the CBT book, those who were randomized saw a small effect indicating increased psychological inflexibility ($d = .40$, 95% CI [-.20, 1.00]), while this effect was negligible for students who chose the intervention ($d = -.02$, 95% CI [-1.19, 1.16]).

A similar trend was observed for behavioral activation, with randomization producing greater increases over time among readers of the ACT book, and choosing a book leading to greater increases in behavioral activation for those using the CBT book ($p = .046$). Students randomized to ACT had large effects during treatment ($d = 1.05$, 95% CI [.48, 1.62]), as did those who chose the book ($d = 1.11$, 95% CI [.41, 1.81]). Students reading the CBT book also saw large effects during treatment when they were randomized ($d = 1.27$, 95% CI [.69, 1.84]), and medium effects when they chose ($d = .71$, 95% CI [-.46, 1.89]). Between posttreatment and follow-up, however, randomization led to small effects for increased behavioral activation for students using ACT ($d = .32$, 95% CI [-.38, 1.02]), while choosing ACT led to a small effect for decreased behavioral activation ($d = -.40$, 95% CI [-1.15, .34]) over the same period. Students who used the

CBT book saw small effects suggesting decreased behavioral activation between post and follow-up if they were randomized ($d = -.45$, 95% CI [-1.05, .15]), with negligible effects if they chose their book ($d = .19$, 95% CI [-1.13, 1.52]). The three-way interaction of time, book, and assignment was not a significant predictor of any other process variables (all $ps > .05$).

Processes of Change Predicting Outcomes

A series of linear regression models across both interventions and assignment methods assessed whether change in process variables from baseline to midtreatment predicted posttreatment outcomes in depression, anxiety, and depression-related stigma while controlling for baseline outcome scores (see Table 11). Changes on the ATQ from baseline to midtreatment significantly predicted all three outcomes at posttreatment, with one standard deviation in change score associated with 0.37, 0.33, and 0.35 standard deviation reductions in depression, anxiety, and depression-related stigma, respectively (all $ps < .05$). Additionally, changes on both the CFQ and BADS significantly predicted depression-related stigma at posttreatment. One standard deviation change in CFQ and BADS scores, both in expected directions, were associated with 0.25 and 0.33 standard deviation reductions, respectively, in depression-related stigma (all $ps < .05$). Changes in AAQ-II or TCQ-R scores were not predictive of any outcome at posttreatment (all $ps > .05$).

Finally, to test whether any of the above relationships between therapeutic processes and outcomes were associated more strongly with either the ACT or CBT book, an additional series of mixed-effects models were created. In these models, a three-

way interaction of time, book, and the relevant process measure was tested as a possible predictor of relevant outcome measures. Thus, the models tested whether the overall trends described above between process and outcome variables over time differed between the two books, irrespective of assignment method. Book was found to be a significant moderator in one instance, in which changes in CFQ scores predicted changes in depression-related stigma over time among those receiving the ACT book significantly more than the CFQ served to predict changes for those who read the CBT book ($\beta = -0.24, p = .03$). Otherwise, book did not significantly moderate the relationship between therapeutic process changes and outcome changes over time (all $ps > .10$).

CHAPTER IV

DISCUSSION

Feasibility and Acceptability of Online Bibliotherapy

This study sought to test the effectiveness of two web-delivered bibliotherapy interventions for depressed college students, in addition to examining the effect of client choice on clinical outcomes and adherence. Overall, there was a notable amount of dropout within the sample, with less than half of study participants completing the posttreatment assessment. While these rates of dropout are concerning, they are within the range of other self-help interventions for depression, pointing to the challenges of maintaining engagement with this clinical population over time. For instance, a recent meta-analysis of mobile self-help interventions for depression suggested an overall dropout rate of 47.8% (Torous et al., 2020), which is close to our observed rate of 53.4% of students dropping out by posttreatment. While potential demographic predictors of dropout in self-help for depression have been implicated, such as education level (Schmidt et al., 2018), we did not find any participant characteristics to be predictive of program engagement. Additionally, given the overall high levels of satisfaction reported by students who did continue through posttreatment, it appears likely that difficulties in retaining the sample over time were more reflective of other factors as opposed to dissatisfaction with the interventions. Rates of dropout within in-person psychotherapy trials for depression are notably lower than in self-help, with a recent meta-analysis indicating approximately 18% of participants dropping out of in-person therapy before treatment completion (Cooper & Conklin, 2015). Therefore, it is important to consider

how to address the unique challenges of maintaining engagement in self-guided depression interventions.

Students who read either the ACT or CBT book indicated the overall helpfulness of the intervention and its applicability to college students managing depression. However, students provided more mixed opinions regarding the web-based nature of the book. While participants generally endorsed a high level of satisfaction with the accessibility of the books, a number of students indicated that they would have preferred to read a physical copy of the book if given the option. This finding provides an important consideration for implementation of self-help resources on college campuses, suggesting that online distribution of self-help materials is acceptable to students, but providing the option for physical copies of books may yield higher rates of engagement. Questions remain as to the reasons for students preferring printed self-help books over online ones, such as whether this preference relates to an oversaturation of existing online content already used by students. Results additionally provided insights into how engagement with online self-help could be improved, with students indicating that discussing the book with a therapist/coach or other students would have made the intervention more useful. Future implementation studies could test the effect of such methods on engagement with depressed college students, such as by using adjunctive peer-coaching in addition to a primary self-help resource.

Effect of Choice on Adherence to Treatment

We originally predicted that providing students with a choice of intervention would improve adherence, given the theoretical basis for incorporating client preferences

as a means of increasing the personal relevance of psychological care (Tompkins et al., 2013). However, this construct has been understudied within self-help treatments. Surprisingly, we found that students who chose their self-help book were significantly less likely to complete the intervention than those who were randomized to a book. This effect of choice reducing the likelihood of treatment completion held true above and beyond any discrepancies in adherence between the ACT and CBT books. While previous self-help studies which have provided clients with some options for interventions/modules have shown mixed or inconclusive effects on adherence (Andersson et al., 2011; Lokman et al., 2017), it is notable that the discrepancy in our study was far more pronounced.

While these results were unexpected, there are a number of potential theoretical rationales for why such an effect may have occurred. In the common factors model of traditional psychotherapy (Wampold, 2015), an emphasis is placed on therapist and client reaching an *agreement* on the issues to be addressed in treatment and an appropriate strategy for addressing them. In this study, students were given a choice between two treatments immediately following a baseline assessment, and only by reading a brief description of each intervention. Interestingly, all students who chose their self-help book indicated having a strong or moderate preference for it. However, it is possible that if students had the opportunity to read more in detail about each book, or to consult with a therapist or coach regarding which option may be a better fit for them, we may have seen positive impacts on engagement through facilitating a stronger sense of agreement/match between presenting problem, individual differences, and treatment approach. In other words, it is possible that a notable proportion of students did not choose the “right” book

based on any number of personal or contextual factors, warranting further study in this area. Interestingly, when clinicians themselves have been presented with ACT versus CBT-based responses to hypothetical clinical vignettes, they do not necessarily chose the “right” response which corresponds to their self-identified theoretical orientation (Storaasli et al., 2007). This would suggest that for both practitioners and clients alike, there may be challenges in extracting a clear theoretical perspective from simplified descriptions of interventions.

In addition to the role of client choice on *reducing* adherence, it is also worthwhile to consider the role that randomization may have played on *improving* adherence. While psychopharmacological studies are limited in their comparison to psychosocial interventions, there is recent evidence of a “novelty effect” among patients receiving an antidepressant they have not previously heard of showing greater benefits and tolerance to the treatment (Cipriani et al., 2018), suggesting that this patient population may respond to such processes. However, there is a lack of prior investigation on the effects of treatment uptake when providing depressed clients with novel psychosocial interventions. Moreover, we did not assess in detail the extent to which randomized students had previous exposure to their received treatment, making any inferences about the novelty of the modality to them limited.

Overall, our unexpected findings regarding choice and treatment adherence suggest that when implementing self-help programs on college campuses, providing students with any viable evidence-based treatment for depression may be more important than offering a variety of options for students to select from. Given the clinical associations between depression and impaired decision-making ability, this approach may

serve students in that it could mitigate feeling overwhelmed by numerous treatment options and thus lessen an additional barrier to initiating care. Selecting one primary intervention to distribute to a student population may additionally benefit institutions themselves, who would not need to purchase access to several books. Furthermore, while our study tested a simplistic means of facilitating client choice, more formalized models have been proposed, such as “decision aids,” or interactive modules providing personalized suggestions of treatment options based on client inputs. Such approaches have acceptability among college students (Rogojanski et al., 2019), and may represent a viable “middle ground” between random assignment and simple choice.

Primary and Secondary Outcomes

Importantly, a high proportion of students, regardless of which book they read and whether they chose or were randomized to it, saw reliable reductions in depression over the treatment period. This trend is reflected in both the significant time effects that were observed, in addition to assessing participants for clinically-reliable change, an important metric when determining the real-world effectiveness of interventions (Jacobson & Truax, 1992). Notably, a majority of our students were classified at baseline as having levels of depression consistent with psychiatric inpatients (53.2%), reflecting the severity of depression in our sample. Despite this, an impressive number of students were classified as either fully recovered or recovering by posttreatment, indicating the usefulness of both interventions in reducing depression in a sample with high baseline symptomatology.

Students using the ACT book saw slightly greater reductions in depression over time compared to those reading the CBT book, though post hoc effect sizes between the two interventions were negligible at both posttreatment and follow-up. This potential small discrepancy between treatments is consistent with prior comparisons between ACT and CBT, which have tended to show minimal to no differences between the interventions on depression outcomes (A-Tjak, 2021; Levin & Twohig, 2017). An interesting finding in our sample was that the effect of intervention appeared to differentiate by how students were assigned to it, with ACT performing better among randomized participants and CBT leading to greater improvements in depression for students choosing their book, although significant discrepancies were only found at the follow-up timepoint. To date, more comparisons of ACT and CBT as depression treatments have been made on in-person interventions than on self-help resources, warranting further study to determine whether factors such as choice may differentiate the impact of treatment modality.

Similar to the unexpected trends observed with adherence, having a choice of book predicted lower overall reductions in depression compared to if a student was randomized. While we did not test the impact of adherence on clinical outcomes directly, our findings suggest that randomization to a self-help book led to both increased adherence and better depression outcomes among our student sample. Clarifying this pathway, such as whether depression is affected by assignment method directly, or only through its influence on adherence to an intervention, would help in further understanding how important the means of assigning treatments to students ultimately is.

Secondary outcomes assessed in this study included anxiety and depression-related stigma. Similar to depression, students saw significant reductions in anxiety over time, with these effects holding true irrespective of intervention. The common comorbidity of anxiety and depression among college students points to the need of targeting both in treatment (Jenkins et al., 2020), with the results of this study promisingly indicating that both issues can be addressed concurrently with a low-intensity self-guided intervention. As with depression, greater decreases in anxiety were predicted by randomization to an intervention, with a discrepancy around one-quarter of a standard deviation per timepoint compared to students who chose their book. While effect sizes were small, and only significant in the follow-up period, they suggest that offering students a choice of book may not produce any meaningful benefits in outcomes for either depression or anxiety. Large time effects were likewise found for decreased depression-related stigma, with no indications of any significant differences based on book or assignment method. Given the broad prevalence of depression-related stigma among students (Guarneri et al., 2019), it is promising that two interventions, neither of which explicitly targeted issues around stigma, were nevertheless effective in reducing the severity of stigma over time.

Therapeutic Change Processes

A secondary aim of this study was to determine whether theorized processes of change differed by therapeutic modality or assignment method, in addition to whether changes in processes predicted clinical outcomes. Similar to outcome variables, all change processes saw significant time effects in the expected direction, with the

exception of cognitive reappraisal. The lack of significant change in cognitive reappraisal may have been due to this process not being targeted in the ACT book, and only briefly mentioned in the CBT intervention among many other cognitive strategies. Also, we measured cognitive reappraisal using only the relevant subscale of the Thought Control Questionnaire (Wells & Davies, 1994), while not including the other four factors of distraction, social control, worry, and punishment. Therefore, it is possible that participants saw changes on other cognitive control strategies similar to reappraisal which were not captured in our measurements.

In examining potential differences in therapeutic processes by intervention, we found that the ACT book had a stronger effect on reducing cognitive fusion over time compared to CBT. No other processes were associated more strongly with one book or the other. This finding is consistent with cognitive fusion being identified as a central component of treatment in ACT (Bramwell & Richardson, 2018). Additionally, this finding indicates that cognitive fusion may have served to distinguish the ACT intervention from CBT among this sample of depressed students, whereas both interventions had a largely equal impact on other processes.

While cognitive fusion was the only process found to be affected by intervention, changes in four processes (psychological inflexibility, cognitive fusion, behavioral activation, and frequency of automatic thoughts) were predicted by how students were assigned to their book. For students who were randomized to a book, all of these processes moved more in the directions theoretically associated with better clinical outcomes, consistent with the fact that randomization additionally predicted greater reductions in depression and anxiety. Likewise, a differential effect of assignment

method was detected based on book for psychological flexibility and behavioral activation, with these factors together showing the strongest influence during the follow-up period, similar to the pattern observed in depression outcomes.

Overall, these findings indicate that students who were randomized to a book saw both greater clinical improvements and more movement in associated therapeutic change processes, largely irrespective of which intervention they were assigned to. Similar to the questions raised regarding the impact of randomization on adherence and clinical outcomes, it would be valuable to look into possible models of how randomization or choice may relate to therapeutic process variables, such as whether any correspond with factors such as novelty or curiosity that may come with engagement with an unfamiliar treatment. Alternatively, it is possible that a simpler pathway was responsible, with randomization leading to higher treatment adherence and subsequent improvements in outcomes and process measures.

In addition to understanding whether these processes moved independently over the intervention, we sought to determine the impact they had on the clinical outcomes we targeted. Importantly, we found that changes in frequency of automatic thoughts during the first half of treatment was a robust predictor of all three outcome measures at posttreatment. This finding is consistent with other studies highlighting the role of automatic depressive cognitions in maintaining overall symptomatology, including anxiety (Yapan et al., 2020), and may additionally point to the relevance of this construct for college students in particular. Whereas other change processes were not found to predict outcomes as a whole, both cognitive fusion and behavioral activation were found to be predictive of changes in depression-related stigma. Furthermore, the effect of

cognitive fusion on depression-related stigma appeared stronger for those reading the ACT book. ACT interventions have previously demonstrated effectiveness in targeting self-stigma within a number of psychiatric conditions (Luoma & Platt, 2015), and an important theoretical component of ACT is on acknowledging the universality of psychological struggles due to fusion with rigid patterns of cognition and self-concepts. Our results suggest that targeting cognitive fusion may be an important pathway in reducing patterns of self-stigmatization among students with depression. Additionally, while stigma is often conceptualized as an internalized process, that improvements in behavioral activation predicted reductions in stigma suggests the relevance of targeting outward behavior when addressing this common component of depression. Interestingly, while we did not find depression-related stigma to be influenced by treatment factors such as book or assignment method, this construct appeared to be more sensitive overall to changes in process variables during the first half of treatment. Therefore, effectively addressing depression-related stigma may necessitate targeting specific therapeutic change processes more explicitly, with our findings suggesting that doing so early in treatment can have significant positive impacts.

Limitations

A notable challenge for this study, which may have ultimately affected results, was an inconsistent flow of participants. We initially outreached to students through a variety of methods, including counseling center referrals, class announcements, and postings on a research participation website. While this provided a steady flow of students throughout the first semester we recruited, we struggled to recruit a sufficient

number of new participants through these means during the second semester that the study ran. As an alternate recruitment strategy, we created an online advertisement that was posted on the central landing page for all online student services at the university. This method allowed us to enroll a large number of new students over a short period of time (e.g., dozens of students enrolling for the study over the period of a week). However, many students whom we reached via this method later dropped out of the study, suggesting there may have been a lower level of investment among students who participated in our study this way. Had we been able to recruit students throughout the study through more consistent means, we may have been able to capture a more naturalistic sample of college students seeking self-guided treatment for depression.

We additionally encountered challenges in retaining students over time. While dropout is a significant issue in depression treatment research, especially when using self-guided approaches, we may have encountered additional barriers to retaining our sample due to unique issues among students. For instance, we often had difficulty contacting participants towards the end of an academic semester, even when adding additional reminder calls/emails into our protocol. This pattern may indicate that the 10-week reading schedule for both self-help books was too long for college students, since it is likely to overlap with final examinations at the end of the semester, unless students joined the study very early on. Furthermore, longer durations of depression interventions are associated with increased dropout (Cooper & Conklin, 2015), and the average number of in-person therapy appointments students typically attend is only around five (Association for University and College Counseling Center Directors, 2019), signaling the need to consider the utility of imposing an excessively long treatment when gains could be made

with significantly less. To that end, students could be asked to read specific core chapters as opposed to the entire self-help book, shortening the overall reading schedule.

Condensing the recommended reading schedule may also help with other barriers to completion, such as burnout or loss of motivation over time. It is also likely that the COVID-19 pandemic, and its many associated academic and personal disruptions, negatively impacted study retention for the last cohort of students that we recruited in early 2020.

An additional limitation of this study regarded our randomization method and how participants were assigned to subgroups. We randomized study participants into three initial groups of equal size: receive the CBT book, receive the ACT book, or make a choice between the two books. In our data analyses, however, we found it more informative to compare students by four groups (i.e. ACT-Randomized, ACT-Choice, CBT-Randomized, and CBT-Choice) instead of the initial three (i.e., ACT-Randomized, CBT-Randomized, and all students who chose a book). Since these three initial groups were theoretically equal in size, there was a discrepancy between the number of students reading a certain book who were randomized to it versus those who chose to read the same book. This, in turn, limited our ability to model accurate estimates of group differences when examining interactions involving both book and assignment method. Multilevel analysis is able to provide accurate estimates of regression coefficients even when working with relatively small group sizes (Maas & Hox, 2005), which meant that we were still able to model estimates of overall linear trends. However, our randomization method combined with high dropout meant that one subgroup (CBT-Choice) had only 7 data points at posttreatment, which restricted our ability to detect

meaningful post hoc effect sizes between groups and thus provide more conclusive results. To avert this issue, randomization should have allocated students into two initial groups, randomized or choice, with participants subsequently being divided into either ACT or CBT by random assignment or their own choosing. Assuming that students in the choice condition would divide on their selection of book mostly equally, this method would have allowed for more conclusive group comparisons.

Likewise, further steps could have been taken to minimize bias in how the choice between the two self-help books was presented to students. We relied on basic descriptions of the books derived from summaries of key intervention concepts in an effort to distinguish the ACT and CBT approaches as clearly as possible. However, we could have taken stronger measures to ensure that the descriptions presented to students were accurate and comparable. For instance, contacting book authors to ask for a brief description could have improved the accuracy in describing key intervention components. Additionally, we could have shared descriptions of books with focus groups of students and asked whether the descriptions were equally appealing and distinct from one another. Given the proliferation of self-help treatments for depression, the issue of accurately presenting and distinguishing various options has notable real-world implications. University libraries, or other entities such as counseling centers which may connect students with self-help resources, should consider ways of accurately presenting distinct treatments, so that students can be appropriately matched based on presenting concerns or personal preferences.

In examining our feedback from students, it was additionally clear that providing an option to receive a physical copy of the self-help book would have been popular.

Though a principal aim of our study was to test a widely-accessible distribution method for depression treatment, the online nature of the self-help books may have not been the first choice for many students, especially considering that the books were originally formatted for print editions and suffered from occasional limitations in their online versions, such as being unable to fill out exercises directly on pages. Additionally, the online library platform did not allow for downloading offline copies of entire books, making it difficult to view materials on more user-friendly devices such as eReaders. Where feasible, students may benefit from a choice between digital or print copies of self-help books, and ideal future improvements in the eBook capabilities of online library systems would provide online bibliotherapy users with a more natural and accessible reading experience.

Certain demographic characteristics of the sample we recruited may also limit the generalizability of study findings. Our sample was largely female, white, and non-Hispanic, and testing online bibliotherapy interventions with more diverse samples of students would help in clarifying the effectiveness of this approach at larger scales. Importantly, however, approximately 20% of our sample comprised students primarily attending a regional campus or engaging in coursework online (i.e. distance learners). The finding that online bibliotherapy was broadly effective in this sample is promising and suggests this method of disseminating treatment to be relevant for distance-learning students who are unlikely to have easy access to a counseling center. At the same time, it would be worthwhile to study this approach at schools with various makeups of students (i.e., residential versus distance education-focused).

Lastly, it is worth noting that a high proportion (53.2%) of our sample reported levels of baseline depression falling within the normative range for psychiatric inpatients according to the classifications established by Ronk et al. (2013). While this may suggest we captured a sample with particularly high symptomatology, prior studies have also found high levels of depression severity among college students (e.g. Beiter et al., 2015), indicating that elevated symptom severity may be commonplace among student populations. On the other hand, it would be worthwhile in future studies to target subsets of students who may present with more varying levels of depression severity (e.g. explicitly recruiting both students waiting to receive counseling as well as those seeking lower-intensity psychological support), in order to determine if online bibliotherapy is viable for a broader range of students.

Conclusion

The results of this study provide much-needed support for the efficacy of using a widely-disseminable and low-cost strategy, online bibliotherapy, to treat depression in college students. Given the numerous internal and practical barriers that students may face in accessing traditional mental health services, it is promising that significant reductions in depression were made using this self-guided approach, which students additionally endorsed as broadly feasible and acceptable. While we observed a notable amount of study dropout within this sample, as well as generally low rates of treatment completion among students who did remain in the study and provide data, these trends were largely consistent with studies of similarly low-intensity depression interventions. It is therefore worth considering the merits of this approach to treating depression in a

college student population, in which issues of engagement and adherence may be inevitable. At the same time, the intervention was highly scalable and produced significant positive effects among students who did engage with it. It is also significant that in addition to reducing depression, both self-help books produced improvements in anxiety and depression-related stigma, two frequently co-occurring challenges in this population. Associations between several therapeutic process variables and depression-related stigma additionally provide imperatives for ways of targeting this construct more specifically. The overall minimal differences we observed in outcomes when comparing book and assignment method suggest that simply providing students with easy access to evidence-based treatments may be more important than which specific modalities are used, and whether students select resources themselves or are simply given one to use. At the same time, our high rates of dropout, and the unexpected influence of assignment method on adherence, point to the need for future studies to explore additional methods besides client choice to improve engagement with interventions, so that students can fully benefit from the effects of these treatments.

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TABLES

Table 1*Group comparisons of demographic variables at baseline*

| | ACT-Randomized (n=45) M(SD)/% | ACT-Choice (n=29) M(SD)/% | CBT- Randomized (n=47) M(SD)/% | CBT-Choice (n=18) M(SD)/% | Group comparison at baseline (one-way ANOVA/chi square) |
|-------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Age | 23.2 (6.7) | 24.1 (7.8) | 23.6 (6.5) | 21.6 (3.7) | F(3, 135) = 0.60, p = .62 |
| Gender | 73.3% female 26.7% male 0% other | 75.9% female 24.1% male 0% other | 80.9% female 17% male 2.1% other | 88.9% female 5.6% male 5.6% other | $\chi^2 = 7.11$, p = .31 |
| Race | 93.3% white 2.2% multiracial 4.4% Native Hawaiian or other Pacific Islander | 93.1% white 6.9% multiracial | 89.4% white 4.3% multiracial 4.3% American Indian/Alaska Native 2.1% Black | 100% white | $\chi^2 = 18.55$, p = .24 |
| Ethnicity | 88.9% not Hispanic/Latinx 11.1% Hispanic/Latinx | 89.7% not Hispanic/Latinx 10.3% Hispanic/Latinx | 91.5% not Hispanic/Latinx 8.5% Hispanic/Latinx | 100% not Hispanic/Latinx | $\chi^2 = 2.16$, p = .54 |
| Student status | 77.8% in-person only 13.3% regional campus 8.9% partially or fully online | 72.4% in-person only 6.9% regional campus 20.7% partially or fully online | 76.6% in-person only 6.4% regional campus 17% partially or fully online | 88.9% in-person only 5.6% regional campus 5.5% partially or fully online | $\chi^2 = 11.11$, p = .74 |
| Median household income | \$20,000-39,999 | \$20,000-39,999 | \$40,000-60,000 | \$40,000-60,000 | $\chi^2 = 17.66$, p = .48 |
| Therapy utilization | 13.3% yes 86.7% no | 24.1% yes 75.9% no | 17% yes 83% no | 16.7% yes 83.3% no | $\chi^2 = 1.45$, p = .69 |
| Medication utilization | 33.3% yes 66.7% no | 44.8% yes 55.2% no | 40.4% yes 59.6% no | 38.9% yes 61.1% no | $\chi^2 = 1.06$, p = .79 |

Note. ACT = acceptance and commitment therapy; CBT = cognitive behavioral therapy

Table 2*Reasons for choosing book and strength of preference*

| | Chose ACT book (n = 29) | Chose CBT book (n = 18) |
|--------------------------------------------------------------|-------------------------|-------------------------|
| <i>Reasons for choosing</i> | | |
| “I like the particular approach the book uses” | 15 (51.7%) | 6 (33.3%) |
| “I thought it would be more helpful” | 6 (20.7%) | 7 (38.9%) |
| “I had a good experience using that kind of approach before” | 0 (0%) | 2 (11.1%) |
| “I wanted to try a new approach” | 2 (6.9%) | 0 (0%) |
| “I didn’t have a strong reason for choosing the book” | 3 (10.3%) | 2 (11.1%) |
| “Other reason” | 3 (10.3%) | 1 (5.6%) |
| <i>Strength of preference</i> | | |
| “Very much so” | 12 (41.4%) | 9 (50%) |
| “A little” | 17 (58.6%) | 9 (50%) |
| “Not at all” | 0 (0%) | 0 (0%) |

Table 3*Book satisfaction items by group*

| | ACT- Randomized (n=45) M(SD) | ACT- Choice (n=29) M(SD) | CBT- Randomized (n=47) M(SD) | CBT- Choice (n=18) M(SD) | Group comparison (one- way ANOVA) <i>p</i> |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|--------------------------------------------------|
| Overall, I was satisfied with the quality of the book. | 4.9 (1.1) | 4.7 (1.3) | 4.6 (0.9) | 4.8 (0.5) | .83 |
| The book was helpful to me. | 4.5 (1.3) | 4.5 (1.3) | 4.5 (1.1) | 4.8 (1.5) | .99 |
| The book was easy to use. | 4.8 (1.1) | 4.9 (0.9) | 4.7 (0.8) | 4.2 (1.5) | .65 |
| I felt the book was made for someone like me. | 4.4 (1.4) | 4.4 (1.4) | 4.4 (1.3) | 4.5 (1.9) | .99 |
| I would like to use the book again in the future. | 4.6 (1.3) | 4.6 (1.5) | 4.6 (1.3) | 4.5 (1.9) | .99 |
| I think the book would be helpful for college students with depression. | 5.1 (1.2) | 4.8 (1.4) | 4.8 (1.1) | 4.8 (1.5) | .92 |
| I would recommend the book to other college students with depression. | 5.0 (1.2) | 4.7 (1.4) | 4.5 (1.2) | 4.5 (1.9) | .72 |
| It was easy to read the book through the library website. | 4.5 (1.4) | 5.0 (1.3) | 4.8 (1.3) | 4.2 (1.7) | .64 |
| I preferred using the library website to read the book online, rather than reading a printed copy. | 3.1 (1.6) | 3.2 (1.8) | 2.6 (1.4) | 2.8 (1.5) | .74 |
| I would have read the book more and engaged in the exercises if I had a therapist or coach supporting me in using it. | 4.2 (1.4) | 4.9 (0.8) | 4.2 (1.3) | 4.0 (2.2) | .37 |
| The book would have been more helpful for my depression if I could have discussed it with a therapist or coach. | 4.1 (1.5) | 4.8 (0.9) | 4.6 (1.0) | 3.8 (1.3) | .20 |
| The book would have been more helpful if I had the opportunity to discuss it with other college students (e.g., a book club). | 3.5 (1.5) | 3.9 (1.7) | 4.1 (1.3) | 3.2 (2.1) | .59 |
| Using this book made me more interested in and willing to go to therapy. | 3.7 (1.1) | 4.0 (1.6) | 3.9 (1.2) | 4.8 (0.5) | .48 |
| Using this book was a good alternative for me to get help with my depression, instead of seeing a therapist. | 4.2 (1.3) | 3.7 (1.4) | 4.1 (1.5) | 4.8 (1.5) | .61 |

Note. All satisfaction items were measured on a 6-point scale from “Strongly disagree” to “Strongly agree.”

Table 4*Adherence to assigned chapters and exercises by condition*

| | ACT- Randomiz ed (n=45) M(SD) | ACT- Choice (n=29) M(SD) | CBT- Randomize d (n=47) M(SD) | CBT- Choice (n=18) M(SD) | Group comparison |
|--------------------------------------------|----------------------------------------|-----------------------------------|-------------------------------------------|-----------------------------------|-------------------------------------|
| Mean % of assigned chapters read | 70.9 (30.0) | 44.7 (34.2) | 55.9 (32.2) | 22.6 (27.6) | F(3, 58) = 0.60, <i>p</i> = .005 |
| # Treatment completers | 11 (24.4%) | 3 (10.3%) | 6 (12.8%) | 0 (0%) | $\chi^2 = 9.15, p = .027$ |
| Compliance w/ exercises ^a | 3.7 (1.6) | 2.9 (1.7) | 3.6 (1.5) | 2.8 (2.1) | F(3,51) = 0.87, <i>p</i> = .46 |

^aMeasured on a 7-point scale from “Did no recommended assignments” to “Did all recommended assignments”

Table 5*Logistic regression models predicting treatment completion*

| Characteristics | Unadjusted ORs [95% CI] ^a | Adjusted ORs [95% CI] ^b |
|--------------------------|-----------------------------------------|---------------------------------------|
| <i>Book</i> | | |
| ACT | Reference | Reference |
| CBT | 0.43 [0.13, 1.29] | 0.35 [0.09, 1.25] |
| <i>Assignment method</i> | | |
| Randomized | Reference | Reference |
| Choice of book | 0.21 [0.04, 0.76]* | 0.20 [0.04, 0.88]* |

Note:

^aUnadjusted models; ^bAdjusted for book/assignment method; **p* < .05

Table 6*Descriptive statistics of outcome variables by condition at each timepoint*

| | ACT-Randomized (n=45) | | | | ACT-Choice (n=29) | | | |
|-----------------------|-----------------------|----------------|----------------|----------------|-------------------|----------------|----------------|----------------|
| | M(SD) | | | | M(SD) | | | |
| | BL | MT | PT | FU | BL | MT | PT | FU |
| DASS-21 Depression | 12.4 (5.5) | 6.2 (4.5) | 5.9 (5.6) | 4.1 (3.7) | 11.8 (5.7) | 7.8 (4.8) | 6.3 (6.0) | 8.0 (6.7) |
| DASS-21 Anxiety | 9.7 (5.6) | 5.7 (3.9) | 5.0 (4.1) | 3.9 (3.3) | 9.0 (5.0) | 5.5 (4.5) | 5.2 (4.7) | 6.4 (6.2) |
| SSDS | 89.3 (16.5) | 75.8 (13.1) | 70.2 (18.7) | 67.3 (16.9) | 89.4 (13.7) | 82.1 (18.1) | 69.7 (20.7) | 75.2 (18.2) |
| | CBT-Randomized (n=47) | | | | CBT-Choice (n=18) | | | |
| | M(SD) | | | | M(SD) | | | |
| | BL | MT | PT | FU | BL | MT | PT | FU |
| DASS-21 Depression | 10.9 (5.5) | 7.9 (4.7) | 5.8 (4.5) | 6.6 (4.2) | 12.8 (4.9) | 10.4 (6.4) | 6.6 (4.4) | 6.8 (5.7) |
| DASS-21 Anxiety | 7.8 (4.4) | 5.6 (4.0) | 3.7 (2.8) | 4.2 (3.7) | 9.0 (4.7) | 7.6 (5.4) | 5.6 (4.5) | 6.6 (6.1) |
| SSDS | 87.4 (15.3) | 81.4 (14.2) | 74.8 (15.1) | 75.9 (20.7) | 84.7 (14.4) | 83.5 (15.5) | 75.4 (18.7) | 78.0 (14.3) |

Note. BL = baseline; MT= midtreatment; PT = posttreatment; FU = follow-up

Table 7*Mixed effects models predicting outcome variables*

| | Time (main effect) β | Book (main effect) β | Assignment method (main effect) β |
|-------------------------------|----------------------------|--------------------------------|-----------------------------------------|
| <i>Outcome</i> ^{a,b} | | | |
| DASS-21 Depression | -0.46*** | -0.19 | -0.11 |
| DASS-21 Anxiety | -0.41*** | -0.31 | -0.17 |
| SSDS | -0.39*** | -0.02 | 0.09 |
| | Time*Book β | Time*Assignment method β | Time*Book*Assignment method β |
| <i>Outcome</i> ^{a,b} | | | |
| DASS-21 Depression | 0.19* | 0.20* | -0.33* |
| DASS-21 Anxiety | 0.16 | 0.24* | -0.21 |
| SSDS | 0.10 | 0.07 | -0.04 |

Note:
^a The

reference groups for β coefficients were Book: ACT book and Assignment Method: Randomized. Therefore, β coefficients reflect estimated differences when a participant read the CBT book and/or chose their treatment.

^b All β coefficients were standardized.

* $p < .05$, *** $p < .001$

Table 8*Rates of clinically reliable change in depression by condition*

| <i>Classification</i> | Total (n=62) | ACT- Randomized (n=20) | ACT-Choice (n=15) | CBT- Randomized (n=20) | CBT-Choice (n=7) |
|-----------------------|-----------------|------------------------------|----------------------|------------------------------|---------------------|
| Recovered | 23 (37.1%) | 9 (45%) | 8 (53.3%) | 4 (20%) | 2 (28.6%) |
| Recovering | 15 (24.2%) | 5 (25%) | 2 (13.3%) | 5 (25%) | 3 (42.9%) |
| Improved | 7 (11.3%) | 1 (5%) | 2 (13.3%) | 2 (10%) | 2 (28.6%) |
| Deteriorated | 3 (4.8%) | 1 (5%) | 1 (6.7%) | 1 (5%) | 0 (0%) |
| Unchanged | 14 (22.6%) | 4 (20%) | 2 (13.3%) | 8 (40%) | 0 (0%) |

Note: Classification of clinical change is based on parameters from Ronk et al. (2013): recovered = moved from inpatient/outpatient range to normal range; recovering = moved from inpatient range to outpatient range; improved = made a reliable change without changing patient category; deteriorated = made a reliable negative change; unchanged = did not make a reliable change

Table 9*Descriptive statistics of process variables by condition at each timepoint*

| | ACT-Randomized (n=45) | | | | ACT-Choice (n=29) | | | |
|--------|-----------------------|----------------|----------------|----------------|-------------------|----------------|----------------|----------------|
| | M(SD) | | | | M(SD) | | | |
| | BL | MT | PT | FU | BL | MT | PT | FU |
| AAQ-II | 34.6 (7.9) | 28.8 (7.8) | 27.4 (9.7) | 23.8 (8.5) | 31.5 (8.1) | 30.4 (8.1) | 27.0 (11.7) | 28.9 (8.0) |
| CFQ | 39.2 (8.0) | 31.2 (8.9) | 30.1 (11.0) | 26.1 (9.7) | 36.1 (7.3) | 30.9 (9.6) | 28.7 (10.8) | 30.6 (10.6) |
| BADS- | 61.6 | 79.3 | 87.5 | 96.1 | 64.7 | 82.5 | 91.3 | 79.6 |
| Total | (23.0) | (24.7) | (28.3) | (24.0) | (22.1) | (20.1) | (27.5) | (29.9) |
| ATQ | 99.6 (29.8) | 75.9 (28.3) | 67.2 (35.0) | 55.1 (20.1) | 90.0 (30.6) | 77.9 (35.9) | 68.9 (37.4) | 67.4 (37.3) |
| TCQ-R | 14.4 (2.9) | 15.2 (2.9) | 15.6 (4.2) | 14.9 (4.7) | 13.6 (3.1) | 15.0 (2.8) | 14.8 (3.4) | 14.1 (3.7) |
| | CBT-Randomized (n=47) | | | | CBT-Choice (n=18) | | | |
| | M(SD) | | | | M(SD) | | | |
| | BL | MT | PT | FU | BL | MT | PT | FU |
| AAQ-II | 33.4 (6.2) | 31.2 (8.2) | 25.8 (5.8) | 28.3 (6.6) | 30.6 (9.5) | 32.0 (9.5) | 26.2 (7.9) | 26.0 (11.8) |
| CFQ | 36.7 (6.6) | 34.2 (8.5) | 28.6 (6.7) | 30.5 (6.6) | 33.8 (11.3) | 34.5 (10.5) | 27.3 (8.5) | 28.1 (12.6) |
| BADS- | 68.2 | 81.2 | 94.5 | 84.4 | 64.1 | 65.6 | 81.8 | 89.3 |
| Total | (22.2) | (23.1) | (16.7) | (26.1) | (25.3) | (34.5) | (21.0) | (44.0) |
| ATQ | 96.3 (27.2) | 78.0 (31.5) | 63.5 (21.7) | 67.4 (21.0) | 86.9 (31.0) | 85.9 (37.3) | 76.2 (27.4) | 66.2 (36.1) |
| TCQ-R | 13.7 (3.4) | 13.7 (3.0) | 13.6 (3.5) | 14.1 (2.8) | 13.6 (2.8) | 13.8 (2.8) | 15.8 (1.5) | 14.1 (3.5) |

Table 10*Mixed effects models predicting process variables*

| <i>Process</i> ^{a,b} | Time (main effect) β | Book (main effect) β | Assignment method (main effect) β | Time *Book β | Time *Assignment method β | Time*Book* Assignment method β |
|-------------------------------|----------------------------------|----------------------------------|-----------------------------------------------|-----------------------|---------------------------------------|--------------------------------------------|
| AAQ-II | -0.39*** | -0.09 | -0.31 | 0.13 | 0.24** | -0.27* |
| CFQ | -0.43*** | -0.18 | -0.31 | 0.17* | 0.21* | -0.24 |
| BADS | 0.41*** | 0.25 | 0.16 | -0.17 | -0.21* | 0.31* |
| ATQ-F | -0.46*** | -0.08 | -0.26 | 0.14 | 0.22* | -0.16 |
| TCQ-R | 0.11 | -0.31 | -0.27 | -0.06 | -0.06 | 0.12 |

Note:

^a The reference groups for β coefficients were Book: ACT book and Assignment Method: Randomized. Therefore, β coefficients reflect estimated differences when a participant read the CBT book and/or chose their treatment.

^b All β coefficients were standardized.

* $p < .05$, *** $p < .001$

Table 11*Processes of change predicting outcomes (mixed effect models)*

| Model: | | | 1 | 2 | 3 | 4 | 5 | | |
|--------------------------------------------------|-----------------------------------------|--------------------------|----------------------------------|-------------------------------|--------------------------------|-------------------------------|---------------------------------|-------------------------------|--|
| <i>Predicting post DASS-21 Depression</i> | | | | | | | | | |
| | <u>BL Depression β</u> | <u>BL p</u> | <u>AAQ-II β</u> | <u>CFQ β</u> | <u>BADS β</u> | <u>ATQ β</u> | <u>TCQ-R β</u> | <u>Process p</u> | |
| Model 1 | 0.55 | <.001 | -0.10 | | | | | .43 | |
| Model 2 | 0.56 | <.001 | | -0.18 | | | | .14 | |
| Model 3 | 0.61 | <.001 | | | 0.15 | | | .27 | |
| Model 4 | 0.66 | <.001 | | | | -0.37 | | .004 | |
| Model 5 | 0.52 | <.001 | | | | | -0.10 | .40 | |
| <i>Predicting post DASS-21 Anxiety</i> | | | | | | | | | |
| | <u>BL Anxiety β</u> | <u>BL p</u> | <u>AAQ-II β</u> | <u>CFQ β</u> | <u>BADS β</u> | <u>ATQ β</u> | <u>TCQ-R β</u> | <u>Process p</u> | |
| Model 1 | 0.38 | .011 | -0.09 | | | | | .55 | |
| Model 2 | 0.36 | .016 | | -0.02 | | | | .87 | |
| Model 3 | 0.38 | .009 | | | 0.10 | | | .52 | |
| Model 4 | 0.41 | .003 | | | | -0.33 | | .020 | |
| Model 5 | 0.32 | .030 | | | | | -0.12 | .38 | |
| <i>Predicting post depression-related stigma</i> | | | | | | | | | |
| | <u>BL SSDS β</u> | <u>BL p</u> | <u>AAQ-II β</u> | <u>CFQ β</u> | <u>BADS β</u> | <u>ATQ β</u> | <u>TCQ-R β</u> | <u>Process p</u> | |
| Model 1 | 0.70 | <.001 | -0.12 | | | | | .29 | |
| Model 2 | 0.72 | <.001 | | -0.25 | | | | .032 | |
| Model 3 | 0.78 | <.001 | | | 0.33 | | | .009 | |
| Model 4 | 0.76 | <.001 | | | | -0.35 | | .004 | |
| Model 5 | 0.69 | <.001 | | | | | 0.14 | .22 | |

Note. Each model tested whether changes in one of five process variables from baseline to midtreatment predicted posttreatment scores on one of three outcome variables, controlling for baseline scores. All β coefficients are standardized to indicate predicted change in outcome variable based on a one-standard deviation change in the process variable being tested.

FIGURES

Figure 1

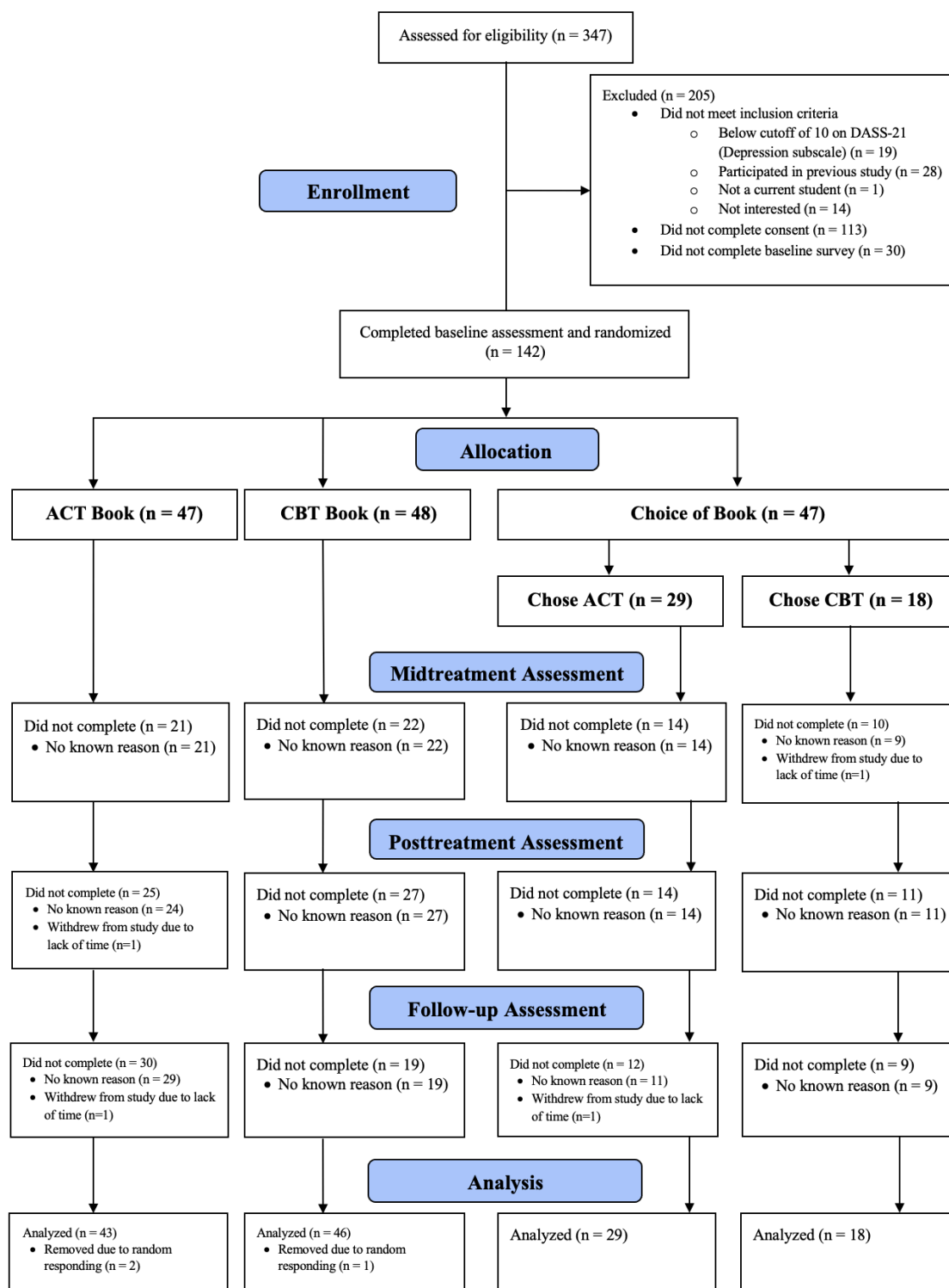
Flow of participants in study

Figure 2

Descriptions of self-help books displayed to study participants

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The Cognitive Behavioral Workbook for Depression: A Step-by-Step Guide to Overcoming Depression</p> | <p>The Mindfulness and Acceptance Workbook for Depression: Using Acceptance and Commitment Therapy to Move Through Depression and Create a Life Worth Living</p> |
| <p>This book will equip you with valuable tools needed to overcome depression. After learning how to keep better track of your thoughts, you will be shown how to challenge the irrational beliefs that maintain the painful cycle of depression. You will be taught the skills needed to fight against a hopeless or worthless mindset, and build resilience to intrusive depressing thoughts that encroach on your daily activities. Essential to this approach will be gaining rational knowledge about what depression is and what it isn't, and using this knowledge to avoid a sense of perfectionism that can often bring you down. Through reading this book and practicing the many included activities, you will learn how to use reason and rationality to avoid catastrophizing negative thoughts and combat depression in your life.</p> | <p>This book will help you to notice how experiences of depression come and go in your life, and how practicing a more mindful awareness of the way you feel may help to loosen the grasp that depression can have. You will learn to clarify what matters most to you in life, and then use these personal values to set goals that keep you heading in the right direction. You will be helped to develop a more accepting and compassionate stance towards difficult thoughts and feelings, so that feeling depressed doesn't have to keep you from doing what's important. At the end of this book, you will be equipped with the skills needed to live more fully in the present and not let depression take away from a meaningful life.</p> |

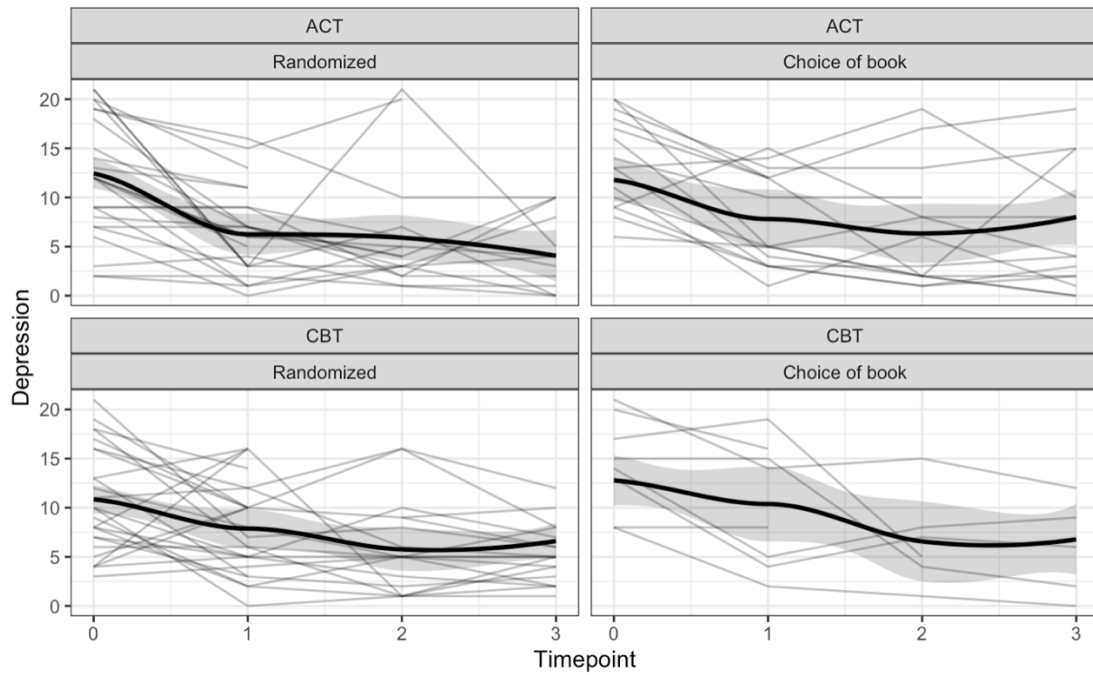
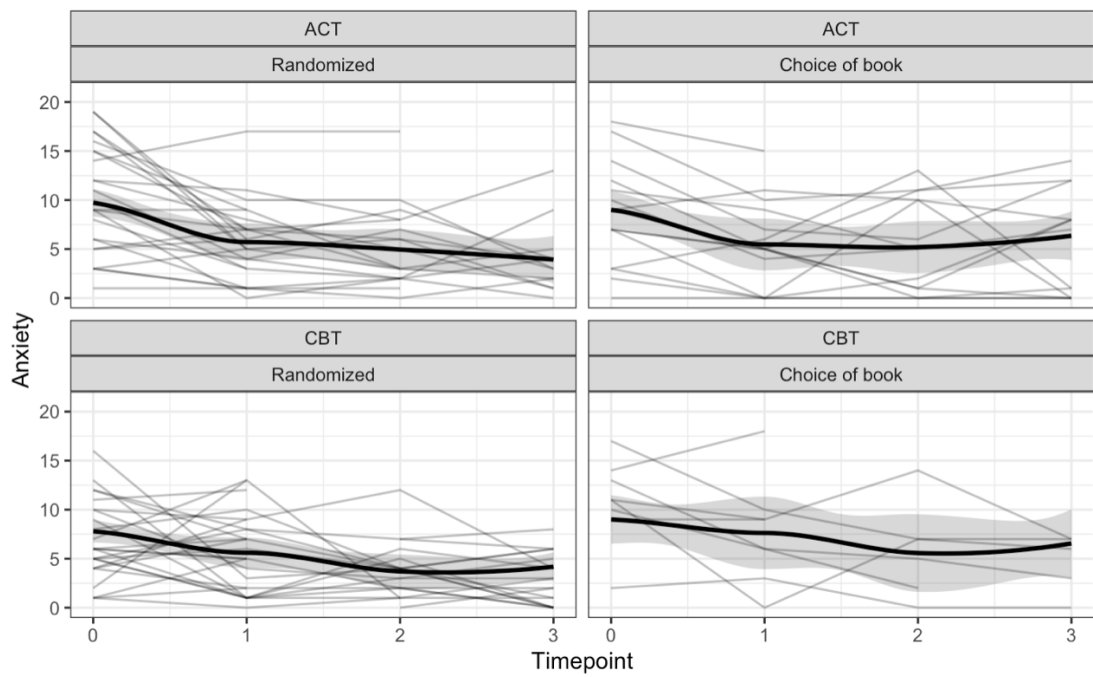
Figure 3*Depression over time by book and assignment method***Figure 4***Anxiety over time by book and assignment method*

Figure 5

Depression-related stigma over time by book and assignment method

