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A COMPARISON OF TWO BEHAVIORAL ACTIVATION PROTOCOLS

A Dissertation by

Jia Hui Chaw

Master of Arts, Wichita State University, 2015

Bachelor of Social Science, National University of Singapore, 2008

Submitted to the Department of Psychology
and the faculty of the Graduate School of
Wichita State University
in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy

July 2020

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A COMPARISON OF TWO BEHAVIORAL ACTIVATION PROTOCOLS

The following faculty members have examined the final copy of this dissertation for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Doctor of Philosophy.

Robert D. Zettle, Committee Chair

C. Brendan Clark, Committee Member

Samantha Gregus, Committee Member

Rachel Petts, Committee Member

Jody Fiorini, Committee Member

Accepted for the College of Liberal Arts and Sciences

Andrew Hippisley, Dean

Accepted for the Graduate School

Coleen Pugh, Dean

DEDICATION

To my family, husband,
and supportive friends

ACKNOWLEDGMENTS

I would like to thank Dr. Zettle for his patience, dedication, and guidance during my graduate studies in Wichita State University. I will always remember the fun times with the lab, including the birthday celebrations and especially the conference trip to Montreal and Brutopia. I am also very grateful to Eric, Kyle, and Charles for helping me to collect data while working on your own dissertation and moving/applying for internship. Marci and Judy, thank you for your constant support emotionally and administratively. I am also grateful to my mentors, intern cohort, and research lab at URMC who offered me support and assistance in completing the dissertation.

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ABSTRACT

Behavioral activation (BA) is an empirically-supported treatment for major depressive disorder that seeks to increase overt behaviors as a way of countering withdrawal and passivity that often occurs during it. While some variants of BA focus more on increasing activities to elevate mood, more recent ones have placed more emphasis on instigating overt actions congruent with personal values. To date, no research has compared the relative efficacy of these two BA protocols nor their possible differential mechanisms of action. This project addressed this omission by utilizing a single-subject experimental design in which participants experiencing clinical depression received an 8-week treatment protocol of mood-based ($n = 6$) or value-based BA ($n = 8$) following 3-5 weeks of baseline. Both protocols produced equivalent statistically and clinically significant outcomes on symptoms of depression, anxiety, and quality of life that were maintained through 2 months of follow-up. However, mediational analyses suggested that they did so through differing processes. Although enhanced overall mood mediated improved outcomes for both groups, it did so to a relatively greater degree in the value-based protocol. In addition, increased enjoyment from, and importance associated with engaging in activities, were mechanisms of action unique to the value-based group. Limitations of this study, implications of its findings for clinical practice, and recommendations for future research are discussed.

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CHAPTER 1

INTRODUCTION

Major depressive disorder (MDD) is one of the most prevalent and debilitating psychological disorders. It has recently been ranked as the third leading cause of disability worldwide (Vos et al., 2017). MDD is found to increase the risk of the morbidity and mortality of several chronic illnesses, such as stroke (Dong et al., 2012; Pan et al., 2011), diabetes (Knol et al., 2006), and coronary heart disease (Barth et al., 2004; Van der Kooy et al., 2007; Wulsin & Singal, 2003). Depression more generally as well predicts higher suicide risk in children (Greening et al., 2008), adolescents (Avenevoli et al., 2015; Mayes et al., 2015), and older adults (Conwell & Brent, 1995; Conwell et al., 2011) that also contributes to an increased likelihood of early death (Rihmer, 2007). Individuals with depression in addition report higher rates of unemployment and job loss as well as impaired work productivity (Lerner & Henke, 2008), academic performance, and social functioning (Lewinsohn et al., 2003). Given the prevalence and significant costs of depression across all age groups, it is imperative to develop and implement empirically-supported treatments to reduce the overall costs and burden on individuals and society.

Behavioral activation (BA; Lejuez, Hopko, & Hopko, 2001; Lewinsohn & Graf, 1973; Martell et al., 2001) has been increasingly recognized as such a treatment option for depression given its demonstrated efficacy and ease of delivery and dissemination (Jacobson et al., 1996). BA is a structured intervention that focuses on gradually and systematically increasing overt behaviors of depressed clients in order to facilitate their contact with positive reinforcers in the environment. It is currently recognized as an empirically-supported treatment for depression with strong research support by the American Psychological Association's Division 12 (Society

of Clinical Psychology, n.d.) based on criteria recommended by Chambless and Hollon (1998). BA in particular has been found to be superior to antidepressant medication (Dimidjian et al., 2006; McLean & Hakstian, 1979; Moradveisi et al., 2013) and both waiting-list and attention placebo control conditions, with a large effect size of .87 (Cuijpers et al., 2007; Mazzucchelli et al., 2009). In addition, BA was found to be at least as, if not even more, efficacious as cognitive therapy (CT) in reducing depression (Dimidjian et al., 2006; Hopko et al., 2011; Jacobson et al., 1996).

The history of BA can be tracked back to Ferster's (1973) behavioral model of depression as resulting from a deficit in positively reinforced activities. Lewinsohn (1974) subsequently extended this model and developed the first related treatment for depression. According to Lewinsohn's conceptualization, depression is primarily a function of a low rate of response-contingent positive reinforcement resulting from a limited (a) range of reinforcers, (b) availability of reinforcers, and (c) level of skills necessary to contact the reinforcers. His treatment focused on instigating pleasurable activities that elevated mood through contact with positive reinforcers in the environment, and if necessary, also incorporated training in social skills essential in establishing and maintaining rewarding interpersonal relationships. For example, identified enjoyable behaviors such as playing board games, drawing, and watching movies with friends would be included in client activity schedules in order to increase their contact with pleasurable events.

A renewed interest in the use of BA treatment for depression emerged following a component analysis of CT (Jacobson et al., 1996) showing no differences in the effectiveness of behavioral and cognitive techniques within CT. While newer versions of BA continue to be based on a traditional behavioral model for depression, they have also been increasingly

influenced by third-wave cognitive-behavioral approaches, such as acceptance and commitment therapy (ACT; Hayes et al., 2012) that share a similar philosophical perspective on human behavior. Like ACT, these newer iterations of BA have focused more on increasing overt activities that are congruent with personal values than those that have a more immediate mood-elevating effect. For example, clients who value being a loving parent may increase the activity of preparing a healthy breakfast for their child every day.

While studies have demonstrated the relative efficacy of both mood-based (McNamara & Horan, 1986; Zeiss et al., 1979) and value-based BA protocols (Hopko et al., 2011) when compared to treatment-as-usual or to other psychotherapeutic approaches (e.g., CT and interpersonal skills training), no investigations to date have directly compared their efficacy with each other. The purpose of this project was to conduct a comparative evaluation of the two BA protocols while also identifying their possible differential mechanisms of action in alleviating depressive symptoms and in increasing quality of life in individuals with clinical levels of depression.

CHAPTER 2

LITERATURE REVIEW

This chapter will begin with a discussion of the current standing of major depressive disorder (MDD) as one of the world's most formidable mental health challenges. This will be followed by a review of the empirical status of various options, including pharmacotherapy, available to treat depression in general, and MDD more specifically. As will be seen, among options for addressing MDD more generally, and particularly among psychotherapeutic approaches, BA would appear to be the treatment of choice. The historical development of BA and current empirical support for this level of recognition will first be summarized and discussed to provide a broader context within which to then elaborate on the purposes, hypotheses, and details of this study.

Major Depressive Disorder (MDD)

MDD, often referred to as “the common cold” of psychological disorder (Seligman, 1975), appears to be on the rise (Vos et al., 2017). According to the latest estimates, the number of individuals with MDD has increased 11.2% from 2006-2016 globally (Vos et al., 2017). MDD had moved from being the fourth leading cause of global disability in 2005 to the third in 2015 (Vos et al., 2017), and is projected to become the second leading cause by 2030 (Mathers & Loncar, 2005).

Prevalence

The Global Burden of Disease (GBD) Study in 2010 estimated the global point prevalence for MDD at 4.4% (Ferrari et al., 2013). Although the WHO provided the latest

prevalence rate for depressive disorders more broadly, there are no updated estimates on the prevalence for MDD specifically (World Health Organization, 2017). In order to provide the most up-to-date global point prevalence rate for MDD, an estimate of 2.4% for 2016 was generated using GBD data made available by the Institute of Health Metrics and Evaluation. The global rates for 2016 also indicated that MDD is more common among women (2.9%) than men (1.9%). This gender difference was consistently found across all age groups and regions. Differences among age groups are also found. Specifically, the rates of MDD are highest in older adults from ages 55-74 years old (at least 4.4% in females and 2.8% in males), and lowest for children and adolescents who are younger than 15.

Point prevalence rates are also found to vary among various regions of the world. The highest rates of MDD were found in Greenland (5.1%), followed by Morocco (4.9%) and Iran (4.6%). The United States (US) ranked 11th globally with an estimate of 3.6%. As expected, prevalence rates for MDD are considerably higher when broader time spans are considered. Within the US, data obtained from 2001-2004 indicated that the estimated lifetime prevalence rate was 14.4% for individuals who are at least 13 years old (Kessler et al., 2012). The 12-month prevalence rate for MDD in the US increased from 2005 (6.62%) to 2015 (7.28%) (Weinberger et al., 2017) and for 2016 was estimated at 6.7% and 12.8% among all adults (aged 18 or older) and adolescents (12-17 years old), respectively (National Institute of Mental Health, 2017). The current age-related difference in prevalence of MDD with the highest rates reported in the elderly is predicted to become negligible in the future as the increase in rates of depression has been fastest among youth (12-17 years old) (Weinberger et al., 2017).

Why prevalence rates for MDD have increased over the last decade, both globally and more specifically in the US, is unclear, but at least two explanations that are not mutually

exclusive have been offered. First, an increased incidence of newly diagnosed cases of MDD may have contributed to rising prevalence rates. That is, more people may be becoming depressed, although, there are insufficient incidence data to adequately document this possibility. The estimated annual global incidence for MDD in 2000 was 3.2% in males and 4.9% in females (Üstün et al., 2004), but there are no more recent data to verify if the rate of newly diagnosed cases has increased since then. Even if incidence rates for MDD are increasing, it is not apparent why this may be the case, although several possible explanations have been offered. Seligman (1990, 2002), for instance, proposed three factors that may have contributed to the increase in this country: (a) a shift in focus from group to individual achievements, (b) a trend towards unwarranted self-esteem, and (c) a culture of blaming others and seeing oneself as a victim.

Alternatively, prevalence rates for MDD may have increased because the disorder is becoming increasingly chronic in nature (Andrews, 2001; Spijker et al., 2002). For example, Kiloh and colleagues (1988) followed 145 patients with a diagnosis of depression in a longitudinal study and found only 20% of them fully recovered. The majority (63%) continued to experience relapse, and the remaining 17% had either died or had remained incapacitated throughout the 15 years of follow-up. More recently, Spijker et al. (2002) found that 20% of the adult population in Netherlands with a diagnosis of MDD reported a chronic course of the disorder (at least 24 months). In his extensive literature review, Whitaker (2010) suggested that the increased chronicity of MDD is likely related to the use of antidepressants. For example, a meta-analysis by Andrews and colleagues (2011) indicated that patients with MDD assigned to placebo had a lower relapse rate (24.7%) than those treated with antidepressants (44.6%).

Costs

There are several adverse consequences associated with MDD, including physical, psychosocial, and financial costs (Kessler et al., 2012; Spijker et al., 2004; Üstün et al., 2004). The statistics on self-reported disability are supported by other studies that documented the association between MDD and a variety of chronic physical illnesses. MDD is found to increase the risk of the morbidity and mortality of several chronic illnesses such as stroke (Dong et al., 2012; Pan et al., 2011), diabetes (Knol et al., 2006), and coronary heart diseases (Barth et al., 2004; Van der Kooy et al., 2007; Wulsin & Singal, 2003). In a recent WHO survey of 254,404 participants from 60 countries, the overall health score reported was worse for patients with MDD comorbid with chronic illnesses such as diabetes, asthma, and arthritis (Moussavi et al., 2007) than for those with either MDD or chronic illness alone. One explanation for the poorer outcome is the lack of adherence to the recommended treatment for the chronic illnesses (Kessler et al., 2012).

Apart from exacerbating medical conditions, MDD also is a significant risk factor for suicide across various age groups, which can also contribute to an increased risk of early death (Rihmer, 2007). According to national suicide statistics on 16 states in the US, 23.8% of suicide completers were taking antidepressants at the time of their death (Centers for Disease Control and Prevention, 2015). Among adolescents alone, 10.8% of those with MDD also reported a suicide attempt (Avenevoli et al., 2015). Within primary care samples who meet the criteria for MDD, 11.9-42% of older adults also expressed suicidal thoughts (Bartels et al., 2002; Schulberg et al., 1998).

A history of MDD during adolescence increases risk of negative outcomes and is predictive of difficulties in functioning as a young adult. Adolescents with MDD are more likely to report lower life satisfaction (Lewinsohn et al., 2003). Fergusson and Woodward (2002) in addition found 26.2% of adolescents reported that they did not complete their formal education qualifications when researchers contacted them at 18 and 21 years of age.

Recent studies have also focused on the adverse effects of MDD on work productivity. The full-time employment rate was 10.3% lower for individuals with MDD than those without in 2010 and has decreased from 2005 (47.2%) to 2010 (40.3%) (Greenberg et al., 2015). Those in particular with more severe cases of MDD are likely to be unemployed and to be absent from work (Birnbaum et al., 2010). Productivity level is also lower for individuals with MDD than those without, which is estimated to be equivalent to being absent for 2.3 days per month (Birnbaum et al., 2010; Wang et al., 2004).

From these statistics, one could imagine that MDD can be very costly on a national level. In fact, this cost appears to be increasing. The economic burden of MDD in the US was estimated to be \$173.2 billion in 2005, but increased 21.5% to \$210.5 billion in 2010. Of the total cost in 2010, 47% (\$98.9 billion) were direct medical costs; 7% (\$9.7 billion) were suicide-related mortality costs, and 48% (\$102 billion) involved workplace-related costs (Greenberg et al., 2015).

Treatment of Depression

A wide array of options is available in treating depression in general and MDD in particular, including pharmacotherapy, psychological interventions, and their combination.

Olfson and Marcus (2010) estimated that around 51.2% of patients are treated with

antidepressant medications alone, while 6.3% receive psychotherapy without medication, and 42.5% are treated with both pharmacotherapy and psychotherapy.

Pharmacotherapy

Among medications used to treat depression, second-generation antidepressants, such as Prozac (fluoxetine) and other selective serotonin reuptake inhibitors, as well as atypical antidepressants, such as Wellbutrin (bupropion), are the most prescribed drugs (Mojtabai & Olfson, 2014). The efficacy of antidepressants is usually gauged by determining how many patients report at least a 50% reduction in their symptoms (i.e., response rate). Using this metric, approximately 50-58% of patients with MDD respond favorably to antidepressants (DeRubeis et al., 2005; Undurraga & Baldessarini, 2012; Walsh et al., 2002) compared to a response rate of 30-40% among those receiving inactive placebos in randomized clinical trials (Furukawa et al., 2016). While this suggests that pharmacotherapy is more efficacious than pill placebos, the effect is at most modest, and the favorable response rate for medication has been shown to be appreciably diminished when compared with active placebos that mimic the common side effects of antidepressants (Kirsch & Sapirstein, 1998; Moncrieff et al., 2004).

Overall comparisons of the efficacy of antidepressants with placebo conditions, however, may overlook the possibility that response rates may be moderated by the severity of depression. Fournier and colleagues (2010) explored this possibility by examining the effect of antidepressants for different levels of depression, as assessed by the Hamilton Rating Scale for Depression, compared to pill placebo control groups. There was no difference in response rates for those with mild to severe depressive symptoms. However, medications in general were

found to be superior for individuals experiencing more severe levels of depression and for those diagnosed with MDD in particular.

When compared to psychological treatments, antidepressants may be as efficacious at least during an initial treatment phase. A meta-analysis by Amick et al. (2015) of studies that compared second-generation antidepressants and cognitive behavior therapies (CBT) in adult outpatients seeking initial treatment for MDD found no difference between the two approaches. Other studies also showed that the treatment effects of antidepressant are comparable to CBT for individuals with severe depression (DeRubeis et al., 1999, 2005).

While pharmacotherapy and the most efficacious forms of psychotherapy may display comparable levels of effectiveness in the initial stages of treatment, antidepressants may not be as beneficial in the long-run. DeRubeis et al. (2005), for example, conducted a randomized trial comparing how patients with moderate to severe MDD respond to CT, antidepressants, or pill placebo. Both CT and antidepressant groups showed comparable and significantly higher response rates (43% and 50%, respectively) over the first 2 months of treatment than the placebo condition (25%). Equivalent response rates of 58% for the two active treatment groups were also noted at the end of 2 additional months of therapy, at which time all patients in the CT group and a randomly selected half of those in the medication group discontinued treatment. Over a year long follow-up, those who had discontinued pharmacotherapy were more than twice as likely to relapse than those who had initially received CT (76.2% vs 30.8%, respectively). Similarly, Dobson et al. (2008) also found higher relapse rates during the year following the discontinuation of a 16-week treatment program for MDD among patients treated with pharmacotherapy (59%) compared to those who had received CT (39%). Hence, at best, some have suggested that pharmacotherapy for depression should only be considered as palliative in

that it does not result in enduring benefits beyond the termination of treatment (Hollon et al., 2005). At worst, it has been suggested that the prolonged use of antidepressants is iatrogenic in contributing to increased chronicity in MDD (Whitaker, 2010).

Psychological Interventions

Interestingly, treatment preferences for depression in general reveal an opposite pattern from their utilization. About 75% of adults expressed a preference for psychological over pharmacological treatment (McHugh, Whitton, Peckham, Welge, & Otto, 2013). Among psychological interventions for depression, six have been recognized by the American Psychological Association's Division 12 (Society of Clinical Psychology, n.d.) as having strong empirical support based on criteria recommended by Chambless and Hollon (1998). Among these psychological options, CT, behavior therapy/behavioral activation (BA), and interpersonal therapy (IPT) enjoy the most extensive body of research attesting to their relative efficacy. These approaches also were the first three psychological interventions recognized as "empirically validated" for treatment of depression in 1995 by an original task force of Section III, Division 12 (Task Force on Promotion Dissemination of Psychological Procedures, 1995).

Interpersonal therapy. Of these three long-recognized efficacious psychological interventions, IPT is the only one that does not represent a broadly-defined cognitive-behavioral approach. IPT instead has its roots within a neoanalytic/psychodynamic approach to understanding and treating depression. However, like both CT and BA, it is also a time-limited approach that seeks to develop skills to resolve present and recurring interpersonal problem areas that are instrumental in initiating and maintaining depressive symptoms (Klerman et al., 1984). The following four interpersonal problem areas or issues, in particular, are evaluated as possible

therapeutic targets: (a) interpersonal role transitions, such as job loss and divorce; (b) interpersonal roles/conflicts, such as those involving parenting; (c) grief; and (d) interpersonal deficits, such as a lack of or difficulty in maintaining existing social relationships.

Some of the most widely-cited empirical support for IPT emerged from the National Institute of Mental Health Treatment of Depression Collaborative Research Program (Elkin et al., 1985). This project was a large multisite study of the efficacy of IPT, CBT, and pharmacotherapy in the treatment of MDD. At posttreatment the impact of IPT was comparable to that of CBT and medication (Elkin et al., 1989). At 18-month follow-up, IPT was superior to CBT and antidepressants in improving global social functioning, but did not differ significantly between these other two interventions in other outcome variables, such as probability of relapse (Shea et al., 1992). These overall findings suggest that IPT enhances social functioning as intended and decreases depressive symptoms in both the short and long-term, but that it may not be superior to other active treatments such as CBT and antidepressants in its overall efficacy. Unfortunately, no research to date has compared IPT to BA in treatment of depression in general and of MDD more specifically.

Cognitive therapy. The approach that was originally known as “cognitive therapy” and developed by Aaron T. Beck and colleagues (1979), is perhaps more commonly nowadays referred to as CBT for depression. For this reason, the two terms will be used synonymously throughout this document even though BA, as noted, might also be regarded as a cognitive-behavioral approach. As its name suggests, CT/CBT focuses on identifying and counteracting maladaptive thoughts and beliefs related to depressive symptoms. Since the publication of the first randomized clinical trial suggesting that CT was just as, if not even more, efficacious than pharmacotherapy (Rush et al., 1977), it has become the most extensively researched

psychological approach in the treatment of depression in general and of MDD in particular. As with most psychological interventions, CT can be usefully regarded as a treatment package comprised of several distinct components, with cognitive restructuring originally thought to be the most powerful (Beck et al., 1979). Also consistent with its name, other components within CT, such as behavioral homework assignments, have ostensibly long been thought to also secondarily contribute to correcting thoughts and beliefs that contribute to depression.

As already mentioned, comparisons of CT and IPT suggest that they are equally efficacious as psychotherapies for depression. CT also appears comparable to pharmacotherapy in treating MDD at least during the active phases of each. However, gains from CT are more likely to be maintained following treatment termination as evidenced by lower relapse rates (DeRubeis et al., 2005; Dobson et al., 2008). Despite comparable response rates at posttreatment, those with moderate to severe MDD and treated with pharmacotherapy were more than twice as likely to relapse (76.2%) during the year following treatment termination than those who had initially received CT (30.8%) (DeRubeis et al., 2005). Similarly, over a year long follow-up, Dobson et al. (2008) also found higher relapse rates among those treated with pharmacotherapy for MDD (59%) compared to those who had received CT (39%).

Unlike IPT, there have been several studies that have either directly or indirectly compared CT and BA in treatment of depression. In one of these more widely-cited investigations, Jacobson and his colleagues (1996) in effect conducted one of the first comparisons between the two approaches in undertaking a component analysis of CT. Individuals diagnosed with MDD were randomly assigned to three conditions: (a) behavioral homework alone; (b) behavioral homework plus cognitive restructuring limited to automatic thoughts; and (c) the full CT package that also included cognitive restructuring of core beliefs.

At both posttreatment and 2-year follow-up (Gortner et al., 1998), the behavioral homework alone condition was just as efficacious as the other two that included cognitive restructuring. These overall findings, as well as other subsequent research that also questioned the therapeutic value of cognitive restructuring (e.g., Dimidjian et al., 2006; Richards et al., 2016), resulted in somewhat of a rebirth of BA and in an elevation of its status as a viable cognitive-behavioral alternative to CT.

Behavioral activation. The strategy of increasing activity levels as a treatment for depression originated at least two decades earlier with the work of Ferster (1973) and Lewinsohn (1974). Ferster (1973) hypothesized that depression resulted from a deficit in positive reinforcement and could accordingly be alleviated by having clients reallocate their patterns of overt behavior to include more pleasurable activities. Lewinsohn (1974) subsequently extended this approach by more specifically conceptualizing depression as a function of a low rate of response-contingent positive reinforcement, that in turn, resulted from a limited (a) range of reinforcers, (b) availability of reinforcers, and/or (c) level of skills necessary to contact salient reinforcers. Based on his model, Lewinsohn developed a treatment that primarily focused on instigating pleasurable activities that elevated mood, and if necessary, also including social skills training to establish and maintain rewarding interpersonal relationships. Lewinsohn's approach was recognized as a "probably efficacious" treatment for depression in the first report of what is now referred to as empirically-supported therapies (Task Force on Promotion Dissemination of Psychological Procedures, 1995). However, until the component analysis of Jacobson and his colleagues (1996) became more visible, the promise of BA as another efficacious treatment for depression had not been fully developed nor realized.

Since that time, an accumulation of further research on BA within the last 20 years has considerably elevated and solidified its relative empirical status. Unlike IPT, BA overall appears to be at least a comparable, if not preferred treatment for MDD, especially for more severely depressed individuals, when compared to both pharmacotherapy (Dimidjian et al., 2006; McLean & Hakstian, 1979; Moradveisi et al., 2013) and CBT (Dimidjian et al., 2006). BA was more efficacious than antidepressants at posttreatment in improving life satisfaction (McLean & Hakstian, 1979), and in reducing symptoms in individuals with MDD, especially those of higher severity (Dimidjian et al., 2006; Moradveisi et al., 2013). In contrast, what is now known as the “Seattle study” found comparable levels of self-reported symptom reduction between BA and antidepressants in the treatment of MDD at the end of the 16-week treatment (Dimidjian et al., 2006). However, based on an interviewer-rating scale of depression, those treated with BA displayed a significantly higher remission rate (56%) by scoring within the “normal” range at posttreatment than the pharmacotherapy group (23%), suggesting that the former treatment is preferable to the latter.

In the same study by Dimidjian and colleagues (2006), participants with MDD, especially those of high severity, who received BA also showed greater improvement per week than those treated with CT. Among those who responded during the active treatment phase, no significant difference was found between BA (28%) and CT (35%) in preventing recurrence at the end of the 2-year follow-up. Thus while the two approaches were equally successful in maintaining their gains following treatment termination, BA was more efficacious than CT during the active treatment phase, suggesting overall that BA may also be a preferred therapeutic option for MDD over CT.

As noted previously, no studies have directly compared BA to IPT, or compared the relative effectiveness of BA to both IPT and CBT within the same investigation. However, tentative and at least indirect inferences may be drawn from clinical trials in which both IPT and BA have been compared to CBT. Given that CBT has demonstrated efficacy comparable to IPT in treating MDD more generally (Elkin et al., 1989; Shea et al., 1992), and that BA appears to be more helpful than CBT for those experiencing more severe levels of the disorder (Dimidjian et al., 2006), it seems reasonable to argue that BA may be the preferred treatment option among the three for MDD in general and for more severe cases in particular.

Cost-effectiveness. As illustrated in the preceding sections, the most common way to identify the most efficacious treatment approaches for depression has been to compare their relative impact on outcome measures such as symptom reduction and relapse rates. However, two treatments might be equally efficacious in reducing depressive symptoms, but differ appreciably in their direct and/or indirect costs. For this reason, more recently, researchers have also increasingly compared treatment approaches based on their cost-benefit ratios. Psychological interventions in general appear to be more cost-effective long-term than pharmacotherapy because of therapeutic benefits that endure beyond the termination of treatment (Hunsley, 2003). A limited number of studies have more specifically further evaluated IPT, CT, and BA based on their cost-benefit ratios relative to other treatment options.

In the one study involving IPT, individuals with MDD were randomly assigned to receive it, pharmacotherapy, or primary care-as-usual (Lave et al., 1998). The number of depression-free days and its derivative, quality-adjusted life-year, as well as direct (for medical services received) and indirect costs (transportation and time) were calculated to conduct cost-effectiveness comparisons. Both IPT and pharmacotherapy groups demonstrated better

outcomes, but at a higher cost, than those who received usual care. However, when compared to usual care, both options were found to be more cost-effective alternatives as their greater benefits more than compensated for their increased costs.

In contrast to IPT, more studies have examined the relative cost-effectiveness of CBT. Hollon et al. (2005) found comparable relapse rates during the year following a 16-week program of CT and a pharmacotherapy group that received continuous treatment over the same time span. Although costs were not specifically assessed, it was estimated that CT may have cost twice as much as antidepressant medication during the first 4 months that each was implemented. However, because CT was terminated at this juncture, while the cost of pharmacotherapy continued, this difference was projected to disappear by the eighth month into follow-up. Another study that conducted direct comparisons, found medications alone may lead to 33% higher costs than CT alone over a 2-year period. (Antonuccio et al., 1997).

No direct or indirect studies to date have compared the cost-effectiveness of CT and IPT. However, given that the cost-effectiveness of IPT appears to be comparable to pharmacotherapy (Lave et al., 1998), while that of CT is more favorable (Antonuccio et al., 1997), it seems reasonable to hypothesize that CT may also be more cost-effective than IPT. A recent study suggests that BA can be delivered in a way that is even more cost-effective than CT (Richards et al., 2016). BA provided by mental health workers trained in it, but with no prior formal training in psychotherapy, was comparable to CBT by professional psychotherapists in treating MDD. Both groups showed comparable treatment effects for individuals with MDD, but cost 21% less due to lower training and personnel costs. However, until further assessments are conducted to show that BA is more effective when training and service provision costs of CBT are equal, it is premature to conclude that BA is more cost-effective. Ideally, in order to clarify the cost-

effectiveness of BA relative to CBT, the costs and benefits of each when delivered by professionals and nonprofessionals, would have to be compared.

Although no study to date has directly compared the cost-effectiveness of BA to pharmacotherapy, extrapolation would suggest that it may be more favorable. Given that BA is at least as, if not more, efficacious as CT (Dimidjian et al., 2006), and that CT is more cost-effective than medication (Antonuccio et al., 1997), it can be reasonably surmised that BA should also be more cost-effective than pharmacotherapy. Furthermore, as suggested in the study by Richards and colleagues (2016), if a lower cost BA can produce treatment outcomes comparable to a higher cost CT, and CT is more cost-effective than pharmacotherapy (Antonuccio et al., 1997), it seems plausible that BA would also likely be more cost-beneficial than antidepressants, particularly in the long-run. Dobson and colleagues (2008) estimated that while BA costs twice as much as antidepressants during 4 months of active treatment, the cost of continued antidepressants may start to exceed the cost incurred by BA 9 months after treatment started. In the aggregate, extant research on IPT, CT, and BA suggests that BA is likely the most cost-effective, and hence preferred treatment option for MDD among the three interventions.

Combined Pharmacological and Psychological Treatments

While the literature reviewed thus far has focused on comparisons among separate treatment options, The American Psychiatric Association's (2010) guidelines recommended a combined treatment of pharmacotherapy and psychotherapy for patients with severe and especially chronic MDD. Combined treatment in general is postulated to be better as the separate interventions presumably target different symptoms or augment the effect of each other. (Miller & Keitner, 1996). Conversely, if combined treatment is not significantly better than

psychotherapy alone, it suggests that psychotherapy alone is powerful enough to facilitate treatment changes.

Research examining the combination of IPT and medication has produced inconsistent findings. A series of initial studies found an advantage for combined treatment over IPT alone for treating depression in general and MDD especially (Browne et al., 2002; DiMascio et al., 1979; Weissman et al., 1979). For example, DiMascio and colleagues (1979) did not find any difference in treatment outcomes for patients with MDD who received IPT or pharmacotherapy alone, but that combined treatment resulted in the most symptom reduction. However, a more recent study (Blom et al., 2007) in which MDD clients were randomly assigned to receive combined treatment, IPT alone, IPT with pill placebo, or pharmacotherapy alone found that combined treatment was superior to pharmacotherapy alone, but comparable to IPT alone.

In contrast to IPT, most studies comparing CBT combined with pharmacotherapy to CBT alone in general have found equivalent treatment effects (Hollon et al., 1991). However, factors such as setting (Blackburn et al., 1981), initial severity, and dosage of medication (Thompson et al., 2001) may serve as moderators to treatment responsiveness. In one of the earlier studies, combined treatment was found to be superior to CT alone in a hospital setting, but not among a primary care population (Blackburn et al., 1981). A later study by Thompson and colleagues (2001) explored the effect of combined treatment and CT alone for different levels of severity of MDD and dosage levels of medication. Combined treatment was found to be superior to CBT alone only for individuals with severe MDD and who were receiving a high dose of medication. No differences between both groups were found for those who received a low dose of antidepressants, regardless of depression severity. These overall findings suggest that CBT alone

is effective in reducing significant symptoms and that the inclusion of antidepressants does not enhance treatment, unless they are prescribed at high dosage for those with severe MDD.

Unfortunately, limited studies to date have directly and/or indirectly compared BA combined with pharmacotherapy to it alone. In a recent correlational study, medication status was investigated as a possible moderating variable for the efficacy of BA (Cullen et al., 2006). Similar to previous studies using BA (Porter et al., 1982), there was no difference in outcome between those who were and were not medicated. Another inference can also be drawn that suggests that BA alone may be at least comparable to combined treatment. If BA is at least as, if not more, efficacious as CT (Dimidjian et al., 2006), and CT alone is generally comparable to combined treatment, it seems unlikely that adding medication to BA would significantly enhance its impact.

Behavioral Activation

The extant research on efficacy and cost-effectiveness of BA, IPT, and CT reviewed thus far suggests that BA may be the preferred treatment option among the three for MDD, especially for more severe cases. Although empirical support for BA has grown over the last 20 years, a number of outcome-related questions remain that merit further attention. For one, a direct comparative outcome study of the relative efficacy of BA, IPT, and CBT is needed. Second, further research also is required to assess the cost-effectiveness of BA relative to both approaches as well as pharmacotherapy, and to more clearly determine whether antidepressants add any incremental benefit to BA.

While additional outcome research involving BA would certainly be desirable, at this point in its development, a case can be made that a component and process analysis of it might

be even more illuminating and useful. As with any treatment approach or identifiable therapy, BA can be regarded as a package that over the course of its history has both added new components and modified or made adjustments to existing ones. Knowing what specific components or ingredients within BA are active and which are inert at least creates the possibility of enhancing its overall efficacy by emphasizing those that are more powerful to an even greater degree. The prospect of successfully doing so is likely further enhanced by also identifying the specific mechanisms of action of BA's most potent components. Such knowledge might help guide refinements in existing components or in the development of new ones that are optimally effective in activating key processes of change.

Traditional BA

The origins of BA can be traced back to Ferster's (1973) behavioral model of depression that is based on principles of operant conditioning identified in earlier work with Skinner (Ferster & Skinner, 1957). Within this model, depression involves a reallocation of behavior in which previously positively reinforced activities decrease in strength while behavior under aversive control increases. For example, an individual who recently lost a job that he/she liked and used to enjoy spending time with family and friends (positively reinforcing activity), may feel depressed and begin to withdraw from social interactions to avoid having to talk about being unemployed. The avoidance of embarrassment and shame negatively reinforces social withdrawal, but also precludes an opportunity to engage in otherwise positively reinforcing interactions with family and friends. Although never explicitly detailed in a treatment manual or protocol, Ferster's approach emphasized the use of natural reinforcement by the therapist (1967) and reinforcing consequences inherent in certain activities (1972) in gradually strengthening behaviors to restore the imbalance created during depression.

Similar to Ferster's model, Lewinsohn (1974) postulated that a deficit in positively reinforcing behaviors contributes to the development of depression. Earlier studies by Lewinsohn and colleagues (Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1972) demonstrated that mood is associated with the number of pleasurable activities engaged in, and that those who are more depressed engage in fewer pleasant events. Lewinsohn accordingly proposed that depression results from a low rate of response-contingent positive reinforcement that is itself a function of a limited (a) range of reinforcers, (b) availability of reinforcers, and/or (c) level of skills necessary to contact the reinforcers. For example, an individual who moves to a different city for work may experience a loss of reinforcing social relationships that are no longer easily available. Moreover, poor communication or interpersonal skill deficits may limit developing new, positively reinforcing social relationships in the new city. The individual may also reduce engagement in activities that were previously positively reinforcing, such as going to the movie theatre.

Unlike Ferster, Lewinsohn systematized his approach in developing the first behavioral treatment manual for depression (Lewinsohn et al., 1976). Similar to Ferster, Lewinsohn's therapy also sought to increase the activity levels of clients, but differed somewhat from Ferster in emphasizing behaviors that were maximally pleasant and mood-enhancing as identified by the administration of the Pleasant Events Schedule (PES; MacPhillamy & Lewinsohn, 1982). The PES is a self-report measure that assesses the frequency and level of pleasant activities that occurred in a client's life over the past month. Events that have not been occurring (e.g., going to a movie with friends), but were experienced as very pleasurable in the past, are targeted for activity scheduling.

The activity scheduling component if necessary was combined with another, namely social skills training, that was clearly not within Ferster's "treatment package". For example, in order to attend a movie with friends, the client may have to take the initiative in organizing the event, extending invitations, and so on. A socially adept client with good organizational and assertiveness skills would likely find this process less challenging than one who is not. Under such circumstances, the therapist might rehearse and role-play with the client how to orchestrate the event.

While no studies have compared the efficacy and/or effectiveness of this initial version of Lewinsohn's treatment to antidepressants, it has been found to be equivalent to supportive therapy in reducing the level of self-reported depression. However, based on an interviewer-rating scale of depression, those treated with Lewinsohn's approach demonstrated greater improvement (Padfield, 1976). When compared to other psychotherapeutic options, this version of Lewinsohn's behavioral activation appears to be comparable at posttreatment to CT (Gallagher & Thompson, 1982; Wilson et al., 1983; Zeiss et al., 1979); what is known as interpersonal behavior therapy (Zeiss et al., 1979), but not to be confused with IPT; and psychodynamic approaches (Gallagher & Thompson, 1982). However, those who received psychodynamic therapy reported increased depressive symptoms at the end of a 6-month and 1-year follow-up (Gallagher & Thompson, 1982), while the behavioral, cognitive, and interpersonal behavior groups maintained their gains.

Ferster's behavioral theory of depression and Lewinsohn's initial model and treatment were subsequently overshadowed by CT (Beck et al., 1979). Perhaps not surprisingly, influenced by the growing popularity of CBT, an updated model and iteration of the BA treatment package that incorporated cognitive restructuring was proposed by Lewinsohn and

colleagues (1984, 1985). The activation component from the initial version remained predominant, but the updated protocol also taught depressed clients to challenge their negative thoughts as an additional means of altering their mood. However, the role of cognitive restructuring within BA writ large subsequently was diminished appreciably following the component analysis of CT (Jacobson et al., 1996) that suggested that cognitive restructuring does not contribute to the therapeutic impact of behavioral activation alone. As a consequence, an interest in purely behavioral interventions to treat depression was revitalized.

Contemporary BA

Following this renewed emphasis, two contemporary protocols emerged: (a) a version of BA developed by Martell and colleagues (2001, 2013), and (b) behavioral activation treatment for depression (BATD) by Lejuez and colleagues (Lejuez, Hopko, & Hopko, 2001; Lejuez et al., 2011). The development of both protocols was grounded in traditional behavioral models of depression with an overall aim of increasing response-contingent positive reinforcement (Lejuez, Hopko, LePage et al., 2001; Martell et al., 2001). However, the approach of Martell et al. includes a greater range of techniques to also address rumination and avoidance behaviors that are incompatible with such positively reinforced activities.

Behavioral activation by Martell and colleagues. Inspired by the findings of Jacobson et al. (1996), Martell and colleagues (2001) developed a standalone BA protocol that was primarily based on Ferster's (1973) and Lewinsohn's (1974) initial behavioral models of depression. It was also informed to a lesser degree by the role of self-reinforcement within Rehm's (1977) self-control model of depression. Specifically, this protocol includes the self-delivery of incentives to increase the likelihood of engaging in behaviors that may have delayed

desirable consequences, but that are not immediately positively reinforcing. For example, students could reward themselves with playing computer games after working on job applications.

Martell and his associates (2001, 2013) theorized that aversive life events reduce contact with positive reinforcers in the natural environment, leading to the development of symptoms of depression. Depressed behaviors in particular are conceptualized as coping strategies that are negatively reinforced by avoiding unpleasant emotions. Avoidance and escape behaviors may provide immediate emotional relief, but they do not do so in the long-run. In fact, actions such as social withdrawal may maintain and perpetuate depressive symptoms insofar as they reduce opportunities to contact positive reinforcers (Martell et al., 2001).

The protocol by Martell et al. (2001, 2013) aims to help clients re-engage in healthy or nondepressed behaviors by developing alternative coping strategies in 20-24 sessions. Both contemporary BA protocols acknowledge the importance of a functional analytic approach to understand depressive behaviors, but only that of Martell and colleagues explicitly focuses on teaching clients to also address their avoidant behaviors in increasing positively reinforcing activities. Hence, it can be thought of as having two major components: (a) activation to increase positively reinforcing behaviors, and (b) procedures targeting avoidance and other actions that are incompatible with this objective. Similar to Lewinsohn's (1976), initial BA, activity monitoring, activity scheduling, and social skills training as needed also are techniques employed to increase contact with positive reinforcers.

Activation component. Unlike Lewinsohn's BA, behaviors targeted for activation within Martel's protocol are not necessarily limited to those that primarily are immediately

pleasurable. The initial protocol of Martell et al. (2001) also focused on identifying and increasing behaviors that are reinforced by at least two types of natural consequences. For example, doing household chores may not be immediately pleasurable, but may be socially reinforced by praise from family members and inherently reinforced by a sense of mastery and accomplishment contingent upon completing the tasks. Apparently influenced by the increasing attention given to values within emerging cognitive-behavioral interventions, such as ACT (Hayes et al., 2012), a later revision of the BA protocol of Martell et al. (2013) also suggested identifying target behaviors through the exploration of client values. However, unlike with BATD, this strategy is not the only one offered in guiding the activation process. As a consequence, some therapists following the 2013 protocol of Martell et al. may instigate behaviors that are more mood-enhancing, while others may identify activities that are more informed by a consideration of client values. This leads naturally to what seems to be a somewhat fragmented approach with therapeutic implications that have yet to be adequately explored by appropriate research. This project sought to address this omission by comparing the efficacy of these two different strategies in alleviating depressive symptoms and in improving quality of life.

Avoidance reduction component. The second major component within the protocols of Martell et al. (2001, 2013) targeting rumination and other avoidant behaviors is a new addition to traditional BA and perhaps more unique to this version of contemporary BA. Rumination is viewed as a form of avoidance behavior that decreases one's contact with positively reinforcing behaviors. Although Lewinsohn's initial BA also included some strategies if necessary to reduce the frequency of ruminative thoughts, Martell and colleagues explicitly focus to an appreciably greater degree on teaching clients to functionally assess their ruminative and avoidance

behaviors while engaging in alternative activities. Ultimately, clients learn to engage in positively reinforcing behaviors as identified in their activity schedules in the presence of both negative emotions and ruminative thinking.

The most widely-cited empirical support for this version of BA comes from the aforementioned Seattle study (Dimidjian et al., 2006; Dobson et al., 2008) that compared it to CT and pharmacotherapy in treatment of MDD. Insofar as findings from this study were cited earlier, they will only be briefly summarized again here. Analyses of various outcomes from differing points over the course of treatment and follow-up along with a consideration of severity level as a moderating variable, suggest that the BA protocol by Martell et al. is a more efficacious intervention option for MDD than either antidepressants or CT.

Behavioral Activation Treatment for Depression (BATD). BATD (Lejuez, Hopko, & Hopko, 2001; Lejuez et al., 2011) is based on the matching law (Herrnstein, 1970) that holds that the frequency of depressed versus nondepressed behaviors is directly proportional to the value (e.g., duration and accessibility) of their reinforcement (Lejuez, Hopko, & Hopko, 2001). Someone who recently lost a well-liked job may experience decreased pleasure from previously positively reinforcing activities such as going to the movies. The value of a behavior considered symptomatic of depression, such as staying in bed, may not be inherently reinforcing. However, engaging in nondepressed activities may be less reinforcing, resulting in a reallocation of behavior from a predominance of nondepressed activities to depressed behaviors. It is also possible that staying in bed is additionally supported by concerns of family members, which further increase the reinforcing value of depressed behavior relative to nondepressed activities.

Guided by these principles, BATD aims to increase the frequency of positively reinforcing, nondepressed activities while decreasing the strength of depressed behaviors. The revised treatment manual, BATD-R (Lejuez et al., 2011), provides a brief treatment protocol that can be completed in 10 sessions and includes two key components: (a) activity monitoring, and (b) activity scheduling. Although these components are also found in Lewinsohn's (1976) initial version of BA, different types of behaviors are targeted for activation in each treatment package. While Lewinsohn emphasized instigating mood-enhancing behaviors, the extent to which a behavior has this impact is of secondary importance in BATD-R. Instead, consistent with third-wave cognitive-behavioral therapies, such as ACT (Hayes et al., 2012), Lejuez and colleagues adopt a more functional analytic approach to identify value-congruent behaviors for activation.

A growing body of research suggests that BATD is an efficacious and effective treatment for depression in general, and for MDD in particular. A recent study treating cancer patients with MDD found the efficacy of BATD to be comparable to that of problem-solving therapy in decreasing depressive symptoms, and in improving quality of life as well as medical outcomes at posttreatment and at 1-year follow-up (Hopko et al., 2011). In a separate study, cancer patients with MDD randomly assigned to receive BATD or problem-solving therapy also reported a decrease in suicidal ideation and an increase in hopefulness regardless of the treatment approach (Hopko et al., 2013). Similar to the study conducted by Padfield (1976) on Lewinsohn's version of BA, Hopko and colleagues (2003) in addition compared the impact on depressive symptoms of BATD to supportive treatment. While no differences were found between Lewinsohn's BA and supportive therapy, individuals treated with BATD self-reported significantly greater improvement in depression than those who received supportive treatment, with a large effect size of .73 (Hopko et al., 2003).

As noted, both BATD and Lewinsohn's initial version of BA heavily emphasize the instigation of behavior, albeit of different types. Unfortunately, no study has directly compared these two protocols specifically or investigated whether it is more efficacious to instigate mood-enhancing or value-congruent behaviors. Given that BATD, but not Lewinsohn's BA, resulted in a greater reduction in self-reported depressive symptom than supportive therapy, it could be speculated that instigating value-congruent behavioral changes might be more beneficial than those that are more mood-enhancing. Moreover, the degree to which Lewinsohn's approach impacts quality of life also remains unclear. A primary purpose of this study was to investigate these matters by comparing the two approaches to BA in both reducing depressive symptoms and in improving quality of life.

Comparison of Mood-Based and Value-Based BA

To summarize the history of BA somewhat differently, at least two alternatives have emerged over time in identifying which specific behaviors to target for activation. The first strategy is to instigate behaviors that are pleasurable and lift mood. The other option is to identify behaviors for activation that are consistent with personal values. Although there is empirical support for both mood and value-based BA protocols, no investigations to date have directly compared the efficacy of these two different strategies in both reducing depressive symptoms and in improving quality of life. It should be acknowledged that because some behaviors may serve both functions, the same activity potentially could be targeted by either strategy. For example, playing an exciting game with a child may be fun, but also something that loving parents do. For the purpose of this project, an effort accordingly was made to instigate behaviors that were either predominately mood-enhancing or value-congruent, but not

both. In doing so, several assessment tools that have been used to identify each type of behavior were employed.

Identifying mood-enhancing behaviors. One of the more widely used assessment tools to identify specific mood-elevating behaviors within BA is the PES (MacPhillamy & Lewinsohn, 1982). Because the original PES is quite lengthy (320 items) and includes several obsolete items (e.g., “getting letters, cards, or notes”), a briefer updated version was adapted for this study. The Pleasant Activities List (PAL; Roozen et al., 2008) is a self-report measure of 139 potentially pleasurable activities (e.g., “playing cards”, “hiking”), derived from the PES and the Leisure Interest Checklist (Rosenthal et al., 1989; Rosenthal & Rosental, 1977), that, similar to the PES, are rated twice. First, clients indicate how often they engaged in each activity within the past 30 days. They next rate how enjoyable the activity was, and in the event that the activity in question did not occur, either how pleasurable it was when they last engaged in it, or how enjoyable they expect it would be if it has never occurred. Low frequency events that are rated as most pleasurable would be included in client activity schedules.

Activating value-congruent behaviors. Within BATD-R, a value is defined as “an ideal, quality, or strong belief in certain way of living” (Lejuez et al., 2011, p. 129). Martell and colleagues (2013), on the other hand, adopted the definition of values proposed in one of the first books on ACT (Hayes et al., 1999) as “global desired life consequences” (p. 206). In other words, values provide a constant sense of direction in life and serve to guide a considerable amount of behavior.

Within BATD-R (Lejuez et al., 2011), the Life Areas, Values, and Activities Inventory was developed to identify values within five domains: (a) relationships, (b) education/career, (c)

recreation/interests, (d) mind/body/spirituality, and (e) daily responsibilities. Selected activities rated for their level of enjoyment and importance consistent with each of the five areas are then targeted. For example, a client who values being active within the domain of recreation/interests might go bowling during the weekend.

In contrast, therapists following the BA protocol by Martell et al. (2013) are referred to general guidelines within ACT for identifying client values and related behaviors. More specifically, the protocol notes that it may be more useful to assess values and behavioral goals in the domains of family, interpersonal relationships, work, and leisure. One of the more widely used paper-and-pencil ways of assessing values within ACT has been the Valued Living Questionnaire (VLQ; Wilson et al., 2010). The VLQ was used to identify values and related activities in this study as it examines the importance of a broader array of life domains (10) and how consistently clients have been living in accordance with each during the past week.

Purposes of This Study

The overall purpose of this study was to address two related questions in comparing a mood-based versus value-based approach to BA. The first of these questions was more concerned with their relative therapeutic efficacy, while the second focused more on the possible differential mechanisms of action of the two approaches.

Outcome Question

In order to address the outcome question, at least two measures of therapeutic outcome -- one involving symptom reduction and the other improvement in quality of life -- were analyzed at both macro and microlevels. At a macrolevel, outcome measures were collected at three assessment occasions: (a) pretreatment; (b) posttreatment, following 8 weeks of intervention; and

(c) 2-month follow-up. Between group comparisons of such data can ascertain if one BA approach on average benefits more than the other, but cannot determine if the improvement of single individuals within each can be unambiguously attributed to the intervention they received. For this, single-subject designs are required. Accordingly, a multiple-baseline across participants design element was nested within each treatment condition. Repeated microlevel measures were collected during a 3-5 week baseline phase and at each weekly session of the 2-month long treatment phase in order to control for extraneous events as well as maturation and habituation to assessment (Hayes, 1981). Tracking changes in outcome variables, along with ostensible process variables in this way over time, also provided an opportunity to examine the purported mechanisms of action of each BA protocol in a fine-grained way (Kazdin, 2007).

Symptom reduction. Traditionally, reductions in symptom frequency and severity have been regarded as the principal indicators of treatment outcome. While there is strong research evidence for BA as an empirically-supported treatment for MDD (Society of Clinical Psychology, n.d.), as far as could be determined, the comparative efficacy of mood-based and value-based protocols in ameliorating depressive symptoms has not been evaluated. As noted earlier, BATD, but not Lewinsohn's BA, resulted in a greater reduction in self-reported depressive symptoms than supportive therapy (Hopko et al., 2003; Padfield, 1976). Although not directly compared, these results suggest that value-congruent BA protocols might be more useful than those that are mood-enhancing in decreasing depressive symptoms. Accordingly, it was anticipated that participants receiving a value-based protocol would report greater reductions in self-reported and interviewer-rated depressive symptoms as assessed by the Beck Depression Inventory (BDI-II; Beck et al., 1996) and the Hamilton Rating Scale for Depression (HRS-D; Hamilton, 1960), respectively.

Because of the length of time necessary for its administration, the HRS-D only served as a macrolevel measure in being collected at pretreatment, posttreatment, and follow-up. By contrast, because the completion time for the BDI-II is much shorter, it was administered at these three assessment occasions as well as a microlevel outcome measure during each week within the single-subject design.

Quality of life. Increasingly, improvements in quality of life have also been considered in evaluating the comparative impact of therapeutic options (Frisch et al., 1992; Hollandsworth, 1987). The World Health Organization (WHOQoL Group, 1993) defined quality of life as “an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (p. 153). Because MDD is associated with greater functional impairments and lower quality of life than other physical health conditions, such as diabetes and lung problems (Daniels & Berry, 1989), it has become increasingly important to assess subjective variables such as life satisfaction as an indicator of treatment outcome. Furthermore, it has been suggested that improving quality of life, not just symptom reduction, may sustain remission and prevent future relapses in MDD (IsHak et al., 2011).

There would appear to be at least two pathways through which quality of life might be improved among those receiving treatment for depression. One of these is through an association between reduced depressive symptoms and enhanced quality of life (Papakostas et al., 2004). As individuals experience less depression, their subjective evaluation and satisfaction with various aspects of their lives improves. Despite this inverse correlation, to date relatively few studies have measured the impact of BA on quality of life among individuals with MDD.

Among those that did, BATD was found to improve quality of life in addition to decreasing depressive symptoms (Freij & Masri, 2008; Hopko et al., 2005, 2011, 2013)

A second means by which quality of life might be improved may be a bit more closely tied to the specific approach being offered in treating depression. More broadly, a focus on values in psychological interventions has been found to be effective in enhancing well-being and quality of life (Plumb et al., 2009). For example, a values-focused treatment protocol based on ACT has been shown to promote quality of life and well-being in epilepsy patients at both posttreatment and 1-year follow-up (Lundgren et al., 2006, 2008). Hence, while it was generally expected that both mood-based and value-based protocols would improve quality of life, it was anticipated that the latter might result in a greater increase. For the purposes of this study, a fairly brief self-report measure, the Outcome Rating Scale (Miller et al., 2003), which like the BDI-II can function as both a macro and microlevel measure, was used to assess changes in quality of life as an outcome variable.

Process Question

A second and equally important purpose of this study was to examine the mechanisms of action of the two BA approaches. The purported key therapeutic process in BA more generally is an increase in overt behavior (Hopko et al., 2015; Manos et al., 2010). Two studies showed that increased activation mediated changes in self-reported depressive symptoms (Gaynor & Harris, 2008; Santos et al., 2017). However, both investigations examined the role of increased activity at a macrolevel. To the extent that the two BA approaches compared in this project induce different classes of behavior, it seemed plausible to expect on a more microlevel of analysis that their specific mechanisms of action might differ. For this reason, like the outcome

question, the purported mechanisms of action of the BA approaches compared within this project were examined at both macro and more microlevels of analysis.

Both approaches share overt behavioral change as part of the ostensible pathway through which they realize therapeutic improvement, whether assessed by symptom reduction or enhanced quality of life. Accordingly, increased activity levels were expected to mediate therapeutic change in both BA approaches, and were accordingly monitored at both macro and more microlevels of analysis over the course of this project. Their ostensible mechanisms of action, however, would be expected to differ in the functions served by such increased activity levels, thereby requiring an evaluation of additional process measures. In a mood-based protocol, instigating an increase in pleasurable activities should result in alterations in mood that, in turn, eventuate in overall therapeutic improvement. By contrast, in a value-focused protocol, the increased activities are expected to add meaning to life by their association with domains that are of most personal importance. In order to evaluate if increased activity levels as hypothesized served differential purposes within the two BA approaches, changes in mood and life-related meaning/importance of the activities were also monitored beginning in pretreatment and baseline through a 2-month follow-up.

Macrolevel analyses. Similar to treatment outcome, overall changes in activity levels in general and those specifically related to mood-enhancement and value-congruence as purported process variables were examined at a macrolevel with two measures collected at three assessment occasions: (a) pretreatment, (b) posttreatment, and (c) follow-up. One of these measures is the PAL (Roozen et al., 2008) that assesses the frequency of various activities as well as their subjective enjoyability. As such, the PAL in effect separately measures the levels of activities and pleasure derived from them. Because it instigates behaviors that are identified as

enjoyable, it seemed reasonable to expect that mood-based BA would increase the amount of obtained pleasure over the course of this project to a greater degree than the value-focused protocol. Whether there would also be a similar increase in overall activity, independent of pleasure levels, as assessed by the PAL seemed less certain.

The VLQ (Wilson et al., 2010) as the other macrolevel process measure administered within this study was used to assess changes in the level of value-congruent activities. Because of the way it is scored, the VLQ, unlike the PAL, does not provide a possible assessment of activity level that is independent of values. Although no research has been conducted to evaluate valued living as a possible mechanism of action within BA, increased engagement in value-congruent behaviors preceded decreases in suffering within an ACT approach (Gloster et al., 2017). Accordingly, it was expected that the value-based BA protocol would show a greater increase than the mood-based approach in valued living as assessed by the VLQ.

Microlevel analyses. While a macrolevel analysis allows a more molar examination of hypothesized mechanisms of action by, for example, determining if pre to posttreatment increases in activity levels are predictive of therapeutic improvement from posttreatment to follow-up, it is less sensitive to the relationship between changes in process and outcome variables that may unfold over smaller units of time (i.e., session-to-session). In order to identify the process-outcome relationships in psychological treatments, it is important to demonstrate a temporal sequence of change between the hypothesized mechanisms of action and therapeutic improvement (Kazdin, 2007). To complement the macrolevel of process analysis, a more fine-grained examination of the temporal relationship between changes in process and outcome variables was provided by monitoring repeated measures of each within the single-subject design element. In order to do so, a brief assessment battery including the BDI-II and ratings of quality

of life as outcome variables, in addition to mood and importance related to behavioral homework, was administered weekly within each protocol. It was generally expected that changes in the hypothesized mediating variables would precede therapeutic improvement in both BA protocols and that the overall findings would parallel those of the macroanalysis. More specifically, it was anticipated that increased obtained pleasure would be a stronger mediator of outcome for the mood-based than value-based protocol. By contrast, increased valued living was expected to be more strongly related to therapeutic improvement in the value-focused than mood-enhancement protocol.

Summary and Hypotheses

To summarize, the purpose of this study was to compare the relative efficacy of a mood-based versus value-based approach to BA and also elucidate their possible differential mechanisms of action. In order to address these two issues at both a fine-grained as well as more macrolevel, a modest sample of individuals with clinical levels of depression was randomly assigned to receive 8 weeks of mood-based or value-based BA. As detailed in the next chapter, nested within each condition was a single-subject design element in order to more clearly attribute any overall improvement to the intervention and provide an opportunity to more closely track the relationship between changes in microlevel outcome and process variables over time. Two outcome measures, symptom reduction and quality of life, were assessed in this study in addition to three process measures reflecting (a) an overall increase in activity level, as well as more specific changes in (b) mood and (c) valued living.

The overall design of this study and the measures to be collected and analyzed provided an opportunity to address the following six hypotheses:

1. As mentioned, BATD that seeks to instigate value-congruent activities has been found to be more efficacious than supportive therapy in reducing self-reported depressive symptoms (Hopko et al., 2003; Padfield, 1976). By contrast, similar findings have not been reported for Lewinsohn's BA that focuses on increasing pleasurable activities. For this reason, it was expected that the value-based BA protocol might be more effective in decreasing depressive symptoms as assessed by the BDI-II. Whether similar results would also extend to interviewer ratings of depression as assessed by HRS-D and self-reports of comorbid anxiety was unclear.
2. It was also anticipated that the value-based BA protocol would improve quality of life to a greater degree than the mood-based one for two reasons. One follows from the extent that symptom reduction is correlated with increased life quality. Secondly, other interventions that focus on values have been shown to enhance subjective well-being (Lundgren et al., 2006, 2008; Plumb et al., 2009).
3. Because of the relatively small sample size, the proportion of participants who improve in one protocol as determined by idiographic analyses at the single subject level was not expected to differ significantly from the other. However, the amount of therapeutic change was expected to be greater at an individual level for the value-based BA.
4. Based on similar findings by Gaynor and Harris (2008) and Santos et al. (2017), it was hypothesized at a macrolevel that increased activation as assessed by the PAL would mediate reductions in self-reported depressive symptoms for both BA protocols, but to a relatively greater degree in the mood-based approach. Although some behaviors on the PAL may be both mood-enhancing and value-consistent (e.g.,

- doing things with a child may be an enjoyable activity in and of itself, but also what a loving parent might do), the questionnaire was originally designed using items from the PES and the Leisure Interest Checklist. For this reason, the PAL items are likely to be more reflective of activities that are mood-elevating and thus more impacted by the mood-based protocol. Increased activity levels as assessed by the appropriate subscale of the PAL also were expected to similarly mediate therapeutic improvement as evaluated by the HRS-D and quality of life, although perhaps to a weaker degree.
5. At a microlevel of analysis, increased activation as assessed by administration of a weekly questionnaire was also anticipated to mediate decreases in self-reported depressive symptoms for both BA approaches. However, unlike the PAL, the questionnaire assessed general activity levels that are less likely to be linked with mood induction. For this reason, no differences between the two approaches were expected. While less clear, it also seemed reasonable that a similar process and findings might also extend to improvements in quality of life that occur on a session-by-session basis over the course of active treatment.
 6. Because they sought to activate different classes of behaviors, it was also anticipated that the two protocols would display moderated mediation. Specifically, increased obtained pleasure as assessed by the PAL was expected to be more strongly related to treatment outcomes for the mood-based BA, while increased valued living as assessed by the VLQ was anticipated to be a stronger mediator for the value-based protocol. Similar findings were expected for analyses at the microlevel. Because no study has been conducted to investigate these mechanisms of action in BA, it was unclear if the strength of mediation would vary as a function of different outcome measures.

CHAPTER 3

METHODOLOGY

Participants

A total of 744 potential participants were recruited from the Wichita State University human subject pool and the larger Wichita community through completion of an online screening survey advertised on the SONA system, flyers (see Appendix A) and announcements in the Shocker Blast, campus newspaper, and media (see Appendix B). Individuals ($N = 138$, or 19%) who self-reported a clinical level of depression, as assessed by BDI-II scores of 20 or above (Beck et al., 1996) on the online survey, and who agreed to be contacted were invited to be further assessed for the study, with 49 (36%) agreeing to do so.

Apart from the BDI-II, potential participants were also required to exhibit at least a moderate level of depression (i.e., scores ≥ 14) based on the 17-item version of the HRS-D (Hamilton, 1960) and be fluent in English. Individuals were excluded if they reported a lifetime diagnosis of bipolar or psychotic disorder, were assessed to be at high/imminent suicide risk, and were currently receiving psychotherapy or counseling for depression. Individuals who were on antidepressant medication were eligible to participate provided their dosage had been stable over the last 4 weeks. Of the 49 individuals who were further screened, only 19 (39%) met all inclusion and exclusion criteria, consented to participate, and were assigned to one of the protocols. One of these participants, however, decided to seek treatment elsewhere prior to her initial treatment session, while another participant did not show up for the first session and could not be contacted for rescheduling. Of the remaining 17 participants who started treatment

proper, 3 dropped out at midtreatment (2 from the mood-based protocol and 1 from the value-based protocol).

The background and demographic information of the 14 participants who completed the project are provided in Table 1. The majority (79%) were recruited from the human subject pool. With the exception of one male and an Asian female, all participants were white females. The mean age for the entire sample was 27.7 years with no difference between the two protocols, $t(12) = .49, p = .63$. Half of the participants reported current pharmacotherapy, with four of six from the mood-based protocol (67%) taking antidepressants and three of eight from the value-based protocol (37.5%) taking medication. This proportional difference was not statistically significant, $\chi^2(1, N = 14) = .29, p = .59$. The mean duration of pharmacotherapy for all participants was 24.9 months with no significant difference between the two protocols, $U = 20.5, p = .59$.

Measures

Five types of measures each serving different functions were administered at various junctures during this study: (a) pretreatment screening measures, (b) macrolevel outcome measures, (c) microlevel outcome measures, (d) macrolevel process measures, and (e) microlevel process measures (see Table 2).

Pretreatment Screening Measures

Three measures were administered at pretreatment to obtain relevant background information from participants and to screen them for inclusionary and exclusionary criteria.

Background Information Questionnaire (see Appendix C). Participants were interviewed to obtain demographic information about their age, date of birth, gender, and ethnicity to help identify any background variables that might impact the study's findings. Questions about suicide risk, medication status and history, other current psychological treatment, and presence of bipolar or psychotic disorders were also asked to determine the suitability of participants.

Beck Depression Inventory-II (see Appendix D). The BDI-II is a widely-used, 21-item self-report measure to assess the presence and severity of depressive symptoms. Each item is rated on a 4-point scale with higher scores reflecting elevated levels of depression. Total scores have been found to have high internal consistency; convergent validity with the original BDI (Beck et al., 1961) and other measures of depression, such as the HRS-D (Hamilton, 1960); and 1-week test-retest reliability ($r = .93$) (Beck et al., 1996). Its level of internal consistency based on the sample completing the screening survey ($N = 744$), was also adequate ($\alpha = .93$). The BDI-II served two functions in this study, with the first being as a screening instrument in which participants at pretreatment were required to score 20 or above.

Hamilton Rating Scale for Depression (see Appendix E). The HRS-D (Hamilton, 1960) is an interview-based instrument used to assess depression with good psychometric properties. The requirement of eligible participants to score 14 or greater reflects at least a moderate level of clinical depression on the 17-item version of the HRS-D (Hamilton, 1960). The HRS-D displays high interrater ($> .84$; Hedlund & Vieweg, 1979) and test-retest reliability, ranging from .81 to .96, over 4-7 days (Akdemir et al, 2001; Reynolds & Kobak, 1995; Williams, 1998). Correlations of HRS-D scores with the Center for Epidemiologic Studies Depression

Scale (Radloff, 1977) and the Carroll Rating Scale for Depression (Carroll et al., 1981) provide evidence of moderate to high convergent validity (Feinberg et al., 1981; Craig et al., 1985).

The HRS-D was administered by three advanced level, clinical psychology doctoral students (A, B, and C) guided by the Structured Interview Guide for the Hamilton Depression Rating Scale (SIGH-D; Williams, 1988) who were blind to each participant's protocol assignment (see Appendix F). Each interview was audiorecorded to subsequently assess interrater reliability. One of the interviewers (A) completed the HRS-D at pre, posttreatment, and 2-month follow-up for seven participants (five from the value-based protocol and two from the mood-based protocol). A randomly selected third (i.e., seven) of these recordings (see Table 3) were independently and blindly scored by another graduate student (B), with the score from the initial interviewer serving as the data point. The intraclass correlation for total scores between these two raters was excellent ($r = 0.99, p < .001, 95\% \text{ CI } 0.92\text{--}1.00$) with no significant difference between them in their average HRS-D scores, $t(6) = 1.62, p = .16$.

Due to unforeseen circumstances, each of the remaining seven participants (four from the mood-based protocol and three from the value-based protocol) were interviewed at differing assessment occasions by one of the other two assistants (B or C) (see Table 3). As such, all 21 of these recordings were also scored by the other graduate student who did not conduct the interview to assess interrater reliability. The intraclass correlation for total scores between these two raters was also excellent ($r = 0.96, p < .001, 95\% \text{ CI } 0.90\text{--}0.98$), although HRS-D ratings by B were on average significantly higher than those of C, $t(20) = 4.01, p = .001$. For this reason, average scores from the paired ratings of B and C were computed for data analyses for these seven participants. Because these average scores did not differ from the ratings of interviewer A, no further adjustments were made in analyzing HRS-D data. The absence of any interviewer

effects on HRS-D ratings also was further supported by no differences in BDI-II scores between the seven participants interviewed by assistant A and the other seven interviewed by one of the other two assistants.

Outcome Measures

Two primary dependent variables, specifically symptom reduction and quality of life, were assessed at both macro and microlevel of analysis.

Macrolevel measures. Four measures for assessing treatment outcome at a macrolevel were collected at pre, posttreatment, and 2-month follow-up. In addition to serving as screening measures, the BDI-II and HRS-D also assessed changes in depressive symptoms at posttreatment and follow-up. The remaining two measures reflect an assessment of anxiety and quality of life. Anxiety is commonly included as an outcome measure in studies on MDD (e.g., Hopko et al., 2011) due to its high comorbidity with depression (Kessler et al., 1996). Given that MDD is associated with functional impairments and low quality of life (Daniels & Berry, 1989), it was also important to measure life satisfaction as another outcome variable.

Beck Anxiety Inventory (BAI; Beck & Steer, 1990). The BAI (see Appendix G) is a 21-item self-report measure commonly used to identify cognitive and somatic symptoms of anxiety independent from those of depression. Similar to the BDI-II, participants rate each item on a 4-point scale with higher total scores reflective of increased levels of anxiety. The BAI has demonstrated good internal consistency (Beck & Steer, 1990) as well as temporal stability over 1-week (Beck et al., 1988). Moderate correlations of BAI scores with those from the BDI ($r = .47$) and State-Trait Anxiety Inventory ($r = .58$; Spielberger et al., 1970) reflect comorbidity between symptoms of anxiety and depression and provide support for the instrument's

convergent validity (Fydrich et al., 1992). The BAI displayed adequate internal consistency in this study ($\alpha = .92$) at pretreatment.

Outcome Rating Scale (ORS; Miller et al., 2003). The ORS (see Appendix H) is a 4-item visual analog, self-report measure designed to assess quality of life separately within interpersonal, individual, and social domains in addition to providing an overall evaluation. Participants rated each item by placing a mark on a 10 cm long line, with greater distances from the left starting point reflecting increased satisfaction. A total score of 40 is possible, with higher scores reflecting greater subjective well-being.

Miller et al. (2003) reported that the internal consistency of the ORS was .93 with an acceptable level of 1-day to 2-weeks test–retest reliability of .66. A moderate correlation between ORS score and those from the Outcome Questionnaire 45.2 (Lambert et al., 1996), which is another measure of client functioning, suggests adequate concurrent validity (Miller et al., 2003). The items of the ORS also exhibit sufficient convergent validity based on correlations with the 16-item Quality of Life Scale (Burckhardt et al., 1989) ranging from .49 to .74 (Campbell & Hemsley, 2009). The internal consistency of the ORS assessed at pretreatment in the present study was adequate ($\alpha = .76$).

Microlevel measures. The BDI-II and ORS also served to assess treatment outcome at a microlevel in being administered weekly during baseline and at each treatment session (see Table 1). Although the BDI-II was originally designed to assess symptoms during the past 2 weeks, participants in this study were asked to rate their symptoms during “the past week including today” in order to meet the repeated measurement requirement of the multiple baseline design element.

Process Measures

At least three purported mechanisms of actions were assessed at both macro and microlevels of analysis. One of these measures, increased activation, was thought to be common to both protocols. However, the other two -- reflecting elevated mood and importance associated with increased activities -- were expected to be differential mechanisms of action for the mood and value-based BA protocols, respectively.

Macrolevel measures. Two measures assessing the three ostensible mechanisms of actions were administered at pre, posttreatment, and 2-month follow-up.

Valued Living Questionnaire (see Appendix I). The VLQ is a 20-item questionnaire in which participants first rate the importance of values in 10 life domains on a scale from 1 (*not at all important*) to 10 (*extremely important*) and then how consistently they have been living in accordance with each over the last week on a scale from 1 (*not at all consistent*) to 10 (*extremely consistent*) (Wilson et al., 2010). These ratings provided separate importance and consistency scales as well as a valued-living composite score computed from the cross products of the two ratings. The overall importance and consistency scaled scores were computed by adding ratings for the 10 domains and range from 10-100. Higher valued-living composite scores as an ostensible measure of valued-living were expected to reflect a mechanism of action more specific to the value-based BA protocol.

Research suggests good internal consistency ($\alpha = .79 - .83$) and 1-2 week test-retest reliability ($r = .90$) for importance scaled scores. Levels of internal ($\alpha = .58 - .60$) and temporal stability ($r = .58$) are lower for consistency scaled scores (Wilson et al., 2010), but still adequate. The VLQ is significantly correlated with measures of physical and psychological well-being

such as the Short-Form 36 (Brazier et al., 1992) and the Butcher Treatment Planning Inventory (Butcher, 1998), providing further support for its psychometric properties. Contrary to previous research, the internal consistency of the importance scaled score in this project was lower ($\alpha = .68$) than that for consistency scale ($\alpha = .76$), but still within an acceptable range.

Pleasant Activities List (see Appendix J). The PAL is a self-report questionnaire that assesses the frequency and subjective enjoyability of 139 potentially pleasurable activities in the past 30 days. Most of the items were obtained from the PES and Leisure Interest Checklist, with the addition of newer items to reflect up-to-date activities such as those that involve technology (e.g., computer games). Each item is rated on a scale from 1 (*not at all*) to 5 (*very much*) on both frequency and enjoyability. The frequency scale was used in this study to assess activation level as a putative process variable shared by both protocols. Similar to the scoring methodology in the PES, the cross product of the two ratings yielded a measure of obtained pleasure that as an index of elevated mood served as a process measure expected to be more closely associated with the mood-based BA protocol. Unfortunately, there are no published reports to date on the test-retest reliability or validity of the PAL. The internal consistencies of the enjoyability ($\alpha = .98$) and frequency scales were both adequate in the present study ($\alpha = .89$).

Microlevel measures. In order to evaluate hypothesized mediating variables on a microlevel, participants completed a weekly tracking questionnaire during the baseline phase and until the third treatment session (see Appendix K), and another through the remainder of the treatment phase (see Appendix L) within the multiple baseline design. In both iterations of the questionnaire, items asked participants to rate their overall mood in the past week on a scale from 1 (*very unpleasant*) to 10 (*very pleasant*) and “your activity level compared to last week” (1 = *much lower*; 10 = *much higher*). Activities in the past week also were further rated for their

enjoyability and importance in both forms. The treatment phase questionnaire collected separate ratings for homework and nonhomework activities.

Procedure

Refer to Figure 1 for the flow of assessments conducted at various phases across the study.

Baseline Phase

All participants completed a baseline phase during which three stages of assessment were undertaken prior to starting treatment to determine their eligibility to receive it. The length of the baseline phase of either 3 ($n = 6$), 4 ($n = 7$), or 5 ($n = 6$) weeks for the 19 participants accepted into the treatment phase was randomly determined.

Stage I: Initial screening. All potential participants ($N = 744$) were first required to report a level of clinical depression based on a BDI-II score of 20 or above. The BDI-II was either included within a battery of screening questionnaires presented within an online survey on the SONA system completed by students ($n = 695$) within the university human subject pool or as part of a separate online survey for participants recruited through social media and other means ($n = 49$). Both surveys asked respondents to provide an email address if they wished to be contacted about this or other projects for which they were eligible. Participants who met the BDI-II selection criterion and agreed to be contacted ($N = 138$) were invited to participate in this project by scheduling a time for the second stage of baseline assessment, with only 49 agreeing to do so.

Stage II: Administration of additional screening, outcome, and process measures.

This stage unfolded over 2 weeks during which further screening of participants occurred and the first 2 weeks of baseline data were collected.

Week 1. After obtaining informed consent (see Appendix M), participants were screened for additional exclusion and inclusion criteria. Those ($n = 6$) who completed the online screening survey more than 2 weeks previously first were administered another BDI-II to verify that their self-reported level of depression still fell within the required range. One individual excluded for this reason was informed of her eligibility to participate in another graduate student's dissertation in which she would be taught specific techniques to cope with depressing thoughts.

The remaining 48 participants were next interviewed using the Background Information Questionnaire to assess their English fluency and ensure that they met additional inclusion/exclusion criteria concerning age, medication status, suicidal risk, lifetime diagnosis of bipolar or psychotic disorders, and any current psychotherapy for depression. One individual was dismissed because of suicidal risk and another due to a diagnosis of bipolar disorder. An additional 13 participants were excluded because of recent medication changes or concurrent psychotherapy. All dismissed participants were provided with information about mental health services available through the university's Counseling and Prevention Services and/or the Psychology Department Clinic, as well as COMCARE as a community resource. The 34 retained participants finally during this visit completed the ORS and the baseline phase weekly tracking questionnaire as well as microlevel outcome and process measures, respectively, before scheduling a second assessment session for the following week.

Week 2. One participant failed to keep his appointment for this session and opted not to reschedule, while another could not be contacted. The 32 remaining participants first were further screened for at least a moderate level of clinical depression on the HRS-D (≥ 14), administered by an independent evaluator and guided by the SIGH-D (Williams, 1988). As previously mentioned, all interviews were conducted by advanced graduate students and audiotaped for a subsequent reliability check. Participants who met criterion on the HRS-D were presented with a second consent form (see Appendix N), that provided more details about the remaining phases of this study. Any failing to do so ($n = 13$) were provided with referral information about the aforementioned mental health services available on campus and within the broader community. Following completion of the consent form, the BDI-II, ORS, BAI, as well as the baseline phase weekly tracking questionnaire were administered.

No further assessment at this juncture was conducted of participants ($n = 6$) randomly assigned to 3 weeks of baseline within each protocol apart from asking them during the next week to complete an online questionnaire including the VLQ and PAL before their first treatment session. At this session, the last set of baseline measures, including the BDI-II, ORS, and weekly tracking form were administered before treatment was introduced.

Stage III: Completion of baseline phase assessment. During this stage, additional measures of micro outcome and process variables to meet the requirements of a multiple baseline design across participants were collected from those randomly assigned to 4 ($n = 7$) or 5 ($n = 6$) weeks of baseline. A battery of questionnaires consisting of BDI-II, ORS, and baseline phase weekly tracking form was administered weekly once or twice through an online survey to those assigned to 4 and 5 weeks of baseline, respectively. The VLQ and PAL were also included within the online survey completed by both groups during the last week of baseline for each.

Treatment Phase

Nine of the 19 participants cleared to the treatment phase were randomly assigned to the mood-based protocol and the remaining 10 to the value-based protocol. One participant from each protocol, however, did not begin treatment. In addition, one participant from the mood-based group and two assigned to the value-based protocol dropped out at midtreatment. The six participants who completed the mood-based protocol were equally distributed across the three baseline conditions (i.e., 3-weeks, P03 and P09; 4-weeks, P08 and P10; 5-weeks, P04 and P12). Among the remaining eight who completed the value-based protocol, three were assigned to 3-weeks baseline (P01, P05, and P14), three to 4-weeks baseline (P07, P11, and P13), and two to 5-weeks baseline (P02 and P06).

Both protocols consisted of 8 weekly sessions with microlevel measures of outcome and process variables, specifically the BDI-II, ORS, and the weekly tracking questionnaire administered at the beginning of each. While the first two sessions took approximately 1 hr each, the last six each only lasted approximately 30 min. Homework was assigned in both protocols with a daily monitoring form (see Form 2 of Appendix P) used to plan and monitor either mood- or value-based activities. Sessions within each protocol were guided by manuals adapted from the revised manual for *Behavioral Activation for the Treatment of Depression* (BATD-R; Lejuez et al., 2011). A third of them were randomly audiorecorded for subsequent checks of treatment integrity (see Appendix O). These recordings then were randomly assigned to three independent evaluators with none listening to more than one for each participant. Apart from one evaluator (91.7%), the other two correctly identified the treatment protocol being implemented with 100% accuracy. All three evaluators indicated being equally and highly

confident in their ratings ($M = 6.25$, range = 5.5-6.9) and that the sessions were delivered in adherence to the treatment manuals ($M = 6.72$, range = 6.4-6.9).

Mood-based BA protocol (see Appendix P). As mentioned previously, the BATD-R included activity monitoring and scheduling, but targeted value-congruent behaviors primarily with a secondary focus on mood-enhancing behaviors. In order to specifically target mood-enhancing behaviors, discussions of values in the BATD-R were replaced with ones about enjoyable activities, guided by the participant responses on the PAL. Activities that were rated as highly enjoyable, but engaged in infrequently were first identified, followed by ranking them on how easy or difficult they were to complete (see Form 1 of Appendix P). Finally, the daily monitoring form (see Form 2 of Appendix P) was used to schedule such targeted activities for homework.

Value-based BA protocol (see Appendix Q). The original BATD-R manual was also adopted for this protocol by removing any discussion about the enjoyability of activities to ensure that the behaviors instigated were predominantly value-congruent. While this protocol continued to utilize the original Life Areas, Values, and Activities Inventory in the BATD-R (Lejuez et al., 2011) to facilitate the identification of value-consistent behaviors, it was adapted to include the 10 life domains in the VLQ instead. Life areas rated high on importance but low on consistency, were targeted for discussion about values, guided by questions from *The Happiness Trap* (Harris, 2007). Similar to the other protocol, following the discussion on values, activities consistent with them were identified, ranked (see Form 2 of Appendix Q), and included in the participant daily schedules as homework (see Form 3 of Appendix Q).

Posttreatment Assessment

Most participants ($N = 12$) were administered the HRS-D a second time 1 week after completing treatment either by the same (A or B) or different interviewer (C) as at pretreatment during the baseline phase assessment. Eight of these interviews were conducted face-to-face, while the other four (with three participants from the value-based protocol and one from the mood-based protocol) were completed via phone because of scheduling issues. Due to difficulty in contacting and scheduling, the remaining two participants, both from the value-based protocol, were interviewed in person 2 – 4 weeks following treatment completion. An email was also sent to the participants with a link to an online survey to complete other measures including the BDI-II, BAI, ORS, PAL, and VLQ.

Follow-up Assessment

The process just outlined for the posttreatment assessment was repeated 2 months later, with the exception for two participants from the value-based protocol who completed the HRS-D 9 weeks later due to scheduling issues. Participants were interviewed by either the same interviewer (A or C) or different interviewer (C) as at posttreatment assessment. Upon completion of the assessment, participants received a written debriefing statement of the study (see Appendix R).

CHAPTER 4

RESULTS

Pretreatment Comparisons

As reported earlier, there were no significant differences between the two treatment protocols in the demographic and background characteristics of participants including their gender, age, race, and current as well as historical use of pharmacotherapy (see Table 1). Additional preliminary analyses also were undertaken prior to completing those that addressed the hypotheses of this study to identify any pretreatment differences between the two groups in both outcome (Table 4) and process measures (Tables 5 and 6).

Outcome Variables

A series of Mann-Whitney tests revealed no significant macrolevel pretreatment differences between the two protocols in levels of depression as assessed by the BDI-II, $U = 21.0, p = .76$, and the HRS-D, $U = 23.5, p = .95$. Similarly, no significant pretreatment differences were found between the two treatment groups in levels of anxiety as assessed by the BAI, $U = 22.5, p = .85$, and in quality of life as assessed by the ORS, $U = 12.0, p = .14$.

Process Variables

A series of Mann-Whitney tests (see Table 5) indicated no pretreatment differences at a macrolevel between the two treatment protocols in the following process measures: (a) valued-living as assessed by the VLQ composite score, $U = 18.0, p = .49$, as well as in (b) activation level ($U = 20.5, p = .66$) as assessed by the PAL frequency scale, and in (c) mood ($U = 24.0, p = 1.00$) as evaluated by the cross product of the frequency and enjoyability scales of the PAL. As

indicated in Table 6, there were also no significant pretreatment differences between the two protocols in the baseline averages of microlevel measures for overall mood, $U = 14.0, p = .23$, activity level $U = 14.5, p = .23$, enjoyment, $U = 16.5, p = .35$, and valued-living, $U = 21.0, p = .76$ as assessed by the baseline phase weekly tracking questionnaire (see Appendix I).

Macrolevel Outcome Analyses

The four macrolevel outcome measures (see Table 4) were each analyzed for statistically as well as clinically significant change over time. Because of the small sample size, analyses of statistically significant change and differences between the two protocols were analyzed with appropriate nonparametric tests. As recommended by Jacobson and Truax (1991), the clinical status of participants at posttreatment and follow-up was evaluated for both recovery and improvement based on change from the preceding assessment occasion (i.e., pre to posttreatment and posttreatment to follow-up). Because participants displayed differing levels and even directions of change from posttreatment through follow-up, any reliable change from pretreatment to follow-up was also determined and so noted in Table 7. Cutoff scores for the four measures obtained from either their treatment manuals, or as they have commonly been used in other studies, were employed to determine recovery. A reliable change index (RCI) following the guidelines of Jacobson and Truax (1991) was used to determine whether change, either improvement or deterioration, exhibited for each participant significantly exceeded that which could be attributed to measurement error.

Beck Depression Inventory

Using Friedman analyses of variance (Siegel, 1956), both mood-based, $\chi^2(2) = 6.3, p = .04$, and value-based participants, $\chi^2(2) = 6.8, p = .03$, reported significant, but equivalent,

reductions in levels of depression from pretreatment through follow-up. As can be seen in Figure 2, there was a significant reduction in BDI-II scores for both protocols from pre to posttreatment as indicated by a Wilcoxon signed-rank tests (Siegel, 1956), with no further improvement evident through the 2 months of follow-up for either. Mann-Whitney tests confirmed no differences between the two groups at posttreatment, $U = 15.5, p = .28$, or follow-up, $U = 22.0, p = .85$.

Analysis of clinical significance. The use of decision rule C as recommended by Jacobson and Truax (1991) in determining recovery with overlapping nonclinical and clinical score distributions, as is the case with BDI-II, yielded a cutoff (i.e., 17) that was judged as too high and liberal. Instead a more conservative score of 13 that reflects a minimal level of depression according to the BDI-II manual (Beck et al., 1990) was adopted as the criterion for recovery. Each participant was also classified at both posttreatment and follow-up as improved or not using the standard deviation ($SD = 12.8$) and the 1-week test-retest reliability coefficient ($r = .93$) of the BDI-II reported in the treatment manual within the RCI formula of Jacobson and Truax (1991). A change of 10 points or greater reflected reliable change.

As seen in Table 7, a majority of participants demonstrated recovery at both measurement occasions with no significant differences between the two protocols in the proportions who did so according to Fisher's exact probability test (Siegel, 1956). The two protocols also did not differ from each other in the proportion of participants who reported improvement in their depressive symptoms from pre to posttreatment. At posttreatment, all mood-based participants, with the exception of P08 who displayed deterioration due to an unforeseen family crisis, showed improvement, but save for P04, did not further improve during follow-up. P09 and P12, on the other hand, deteriorated to such a degree from posttreatment that they were no longer

recovered at follow-up. Among the value-based participants, half met criteria for improvement at posttreatment. None of these four attained further improvement through follow-up, and one, P14, for unknown reasons reported deterioration from posttreatment to a level of nonrecovery 2 months later. Another value-based participant, P01, also deteriorated during follow-up and was the only participant within both groups who did not meet any of the recovery or improvement benchmarks.

Hamilton Rating Scale for Depression

Analyses of statistical significance paralleled results from the BDI-II. As displayed in Figure 3, both mood-based, $\chi^2(2) = 9.0, p = .006$, and value-based protocols, $\chi^2(2) = 12.3, p = .001$, also evidenced significant and comparable reductions in interviewer-rated depression symptoms from pretreatment through follow-up. More specifically, both groups were rated as significantly less depressed at post than pretreatment, with no further reductions occurring through follow-up for either. Also as with self-reports of depression, Mann-Whitney tests found no significant differences between the two protocols at either posttreatment or follow-up.

Analysis of clinical significance. A score of 6, as used by Elkin et al. (1989) to reflect recovery, was also adopted as the criterion in this study. The requirement for reliable change of 8 points or more at both measurement occasions was determined using the standard error of measurement ($SEM = 2.66$) and the 1-week test-retest reliability coefficient ($r = .96$) of the HRS-D reported by Reynolds and Kobak (1995).

As shown in Table 7, half of the mood-based participants met the criterion for recovery at posttreatment, with P10 being the only one of the three to maintain this status at follow-up.

Three value-based participants were rated as recovered at posttreatment which did not differ

significantly from the proportion within the mood-based protocol similarly evaluated based on Fisher's exact probability test (Siegel, 1956). Two of the three value-based participants (P11 and P13) maintained their recovery through follow-up where they were joined by P06. However, this proportion (3 of 8 = 37.5%) did not differ from that of the mood-based group (1 of 6 = 16.7%) at follow-up. There was also no significant difference found between the proportion of participants rated as showing improvement in their depressive symptoms within both protocols. Of the four mood-based participants who demonstrated improvement from pre to posttreatment, none continued to do so during follow-up. As with the BDI-II, P08 who failed to show any clinically significant change at posttreatment met the criterion for improvement at follow-up. Half of the value-based participants evidenced improvement at posttreatment with no further changes noted among them during follow-up, apart from P14 who deteriorated during this time period. While all of the mood-based participants met at least one of the clinically significant criteria, three value-based participants (P01, P02, and P07) failed to do so.

Beck Anxiety Inventory

Friedman analysis of variance found a significant decrease in self-reported anxiety symptoms for value-based participants, $\chi^2(2) = 9.3, p = .005$, from pretreatment through follow-up. As indicated in Figure 4, BAI posttreatment scores were significantly lower compared to those at pretreatment with no additional improvement through follow-up. Decreased levels of anxiety for mood-based participants from pretreatment to follow-up fell just short of being statistically significant, $\chi^2(2) = 4.3, p = .06$. Nonetheless, there were no differences between the two groups at posttreatment, $U = 14.0, p = .11$, or follow-up, $U = 21.5, p = .38$, based on Mann-Whitney tests.

Analysis of clinical significance. A score of 7 reflective of a minimal level of anxiety based on the BAI manual (Beck & Steer, 1993) was established as the cutoff score for recovery. The standard deviation ($SD = 11.41$) and 1-week test-retest reliability ($r = .75$) from the original paper detailing the development and psychometric properties of the (Beck et al., 1988) were used in the formula proposed by Jacobson and Truax (1991) to establish 16 or more points as reliable change.

Although the same three mood-based participants (P03, P09, and P10) met the recovery criterion at both measurement occasions, as seen in Table 7, none of the value-based participants did so at posttreatment, and only two at follow-up. There was no significant difference between the two protocols in the proportion of participants reporting recovery at follow-up based on Fisher's exact probability test (Siegel, 1956), but a similar comparison at posttreatment fell just short of being statistically significant ($p = .055$). There was also no significant difference between the two interventions in the proportion of participants who reported improvement in their levels of anxiety at either posttreatment or follow-up. Within the mood-based protocol, half showed improvement at posttreatment with no further progress at follow-up. Comparatively, only one quarter of the value-based participants, P01 and P02, reported similar limited improvement from pre to posttreatment although another two (P05 and P06) evidenced improvement during follow-up.

Outcome Rating Scale

Both mood-based, $\chi^2(2) = 7.0, p = .02$, and value-based protocols, $\chi^2(2) = 6.3, p = .02$, reported significant, albeit equivalent increases in quality of life as measured on the ORS from pretreatment through follow-up (Figure 5). Both groups displayed significant increases in

quality of life at posttreatment with no further improvement through follow-up. As with the other outcome measures, Mann-Whitney tests did not reveal any differences between the two protocols at either posttreatment or follow-up.

Analysis of clinical significance. The benchmarks for determining recovery and improvement on the ORS were based on a study by Reese and colleagues (2014) that followed Jacobson and Truax's (1991) recommendations in assessing clinical significance. A score of 25 was used to establish recovery and 5 or more points reflected reliable change at both measurement occasions.

As shown in Table 7 and as confirmed by Fisher's exact probability test (Siegel, 1956), there were no significant differences between protocols in the proportion of participants who displayed recovery at posttreatment and follow-up, with at least half doing so within each group at both measurement occasions. Similarly, the two protocols also did not differ from each other in the proportion of participants who reported improvement in their quality of life. None of the half or more from each group who showed improvement from pre to posttreatment progressed further during the 2 months after treatment, with one mood-based participant (P12) and two value-based participants (P07 and P14) deteriorating to such a degree that they could no longer be considered recovered at follow-up. On the other hand, one participant from each protocol (P08 and P02) improved enough during follow-up to meet the criterion for recovery by its end.

Macrolevel Process Analyses

The three macrolevel measures derived from the VLQ and PAL were analyzed for only statistically significant change over time (see Table 5). Because they were regarded as process rather than outcome measures, they were not also analyzed for clinically significant change.

Valued Living Questionnaire

Friedman analyses of variance (Siegel, 1956) indicated that the two protocols differed from each other in increased valued living from pretreatment to follow-up. As seen in Figure 6, while there was no significant increase in VLQ composite scores over the course of the study for mood-based participants, $\chi^2(2) = 1.0, p = .30$, there was one for value-based participants, $\chi^2(2) = 6.6, p = .018$. A further analysis indicated a significant increase for this group from pre to posttreatment, $z = 2.37, p = .009$, with no further improvement at follow-up, $z = .56, p = .29$. However, similar to what was found at pretreatment, the two protocols did not significantly differ from each other at posttreatment, $U = 20.0, p = .66$, or follow-up, $U = 21, p = .76$, based on Mann-Whitney tests.

Pleasant Activities List

Two separate scores were obtained from the PAL to measure different processes. PAL frequency scale score served to assess activation, while its cross product with enjoyability ratings yielded a measure of obtained pleasure, which served as an index of mood.

PAL frequency. A significant increase in activity level over the course of this study was noted among mood-based participants, $\chi^2(2) = 4.7, p = .047$, but not for those in the value-based protocol, $\chi^2(2) = .25, p = .44$. As shown in Figure 7, although there was no significant increase in level of activation reported by mood-based participants from pre to posttreatment, $z = .73, p = .24$, further improvement occurred through the 2-month follow-up, $z = 1.78, p = .04$. Mann-Whitney tests, however, did not find any differences in the level of activation between mood-based and value-based protocols at posttreatment, $U = 14.5, p = .23$, and follow-up, $U = 21.0, p = .76$.

PAL obtained pleasure. Although Figure 8 displays a general trend of increased mood across the three measurement occasions for both groups, it failed to attain statistical significance for both mood-based, $\chi^2(2) = 4.0, p = .68$, and value-based participants, $\chi^2(2) = 1.00, p = .30$. As with PAL frequency, no significant differences were noted between mood-based and value-based protocols at posttreatment, $U = 24.0, p = 1.00$, and follow-up, $U = 20.0, p = .66$.

Microlevel Outcome Analyses

As noted by Borckardt and colleagues (2008), a reliance on the visual inspection of graphs tends to result in an overestimation of improvement, especially if the time-series data are not independent of each other as was the case in this study (i.e., autocorrelation). Hence, the two microlevel outcome measures also were analyzed by the percentage of nonoverlapping data (PND; Scruggs et al., 1987; Tarlow & Penland, 2016a) and with simulation modeling analyses (SMA; Borckardt et al., 2008) to supplement visual inspection of the graphs in Figures 9-12. While the graphs visually display changes in microlevel measures beginning in the baseline phase over time, the two analyses assess the statistical significance as well as effect sizes of any between-phase changes in data streams.

Whether any changes from baseline to treatment phases in the microlevel outcome measures were significant for each participant was separately determined with the two statistical analyses. As its name suggests, PND calculates the percentage of data points in the treatment phase that show improvement relative to minimum and maximum baseline data points, respectively, of the BDI-II and ORS. An online PND calculator developed by Tarlow and Penland (2016b) was used. PND does not control for serial dependency in single-subject data, but appears to be relatively unaffected by it (Manolov & Solanas, 2008). As recommended by

Scruggs and Mastropieri (1998), a treatment phase was deemed “very effective” if the percentage score was above 90 and “effective” if between 70-89. However, some caution is advisable in interpreting effect size findings of the PND for at least two reasons. First, it may underestimate treatment effect sizes if there is an outlier data point during baseline that is in the direction of the expected change. Second, if the baseline trend is in the direction of the expected outcome, PND alternatively may overestimate treatment effect sizes (Tarlow & Penland, 2016a).

Because of these limitations associated with PND, SMA, which controls for serial dependency in single-subject data and is recommended with less than 30 repeated observations (Borckardt et al., 2008), was used as an alternative means of determining statistical significance as well as associated effect sizes. Free software made available online by one of the developers of SMA (Borckardt, n.d.) was used to calculate separate Pearson r values expressing the linear association between each of the microlevel outcome measures and phase vectors that reflect treatment effect sizes.

Beck Depression Inventory

Figure 9 displays weekly scores from the baseline and treatment phases of each participant who received the mood-based BA protocol, while Figure 10 presents comparable data for those in the value-based group.

Mood-based protocol. The two participants with 3-week baselines, P03 and P09, showed differences in both levels and slope of self-reported depression during this phase. As seen in the first two panels of Figure 9, P03 during baseline reported a higher and more variable range of depression than P09 who generally displayed a downward slope. Both also differed from each other in what occurred during the treatment phase. P03 showed a clear immediate

drop in her BDI-II scores with the introduction of treatment that was maintained for the duration of its implementation, reflecting a statistically significant change with large effect sizes as assessed by both PMD and SMA (see Table 8). P09 also reported a discernible decrease in depression when treatment was introduced, but this was followed by an accelerating trend to such a degree that her BDI-II score at week 7 (i.e., 26) was comparable to those from the baseline phase. This increase appeared to be attributable to remembering past trauma and a lack of homework engagement. This peak was then followed by a sharp drop, as she recommitted to completing behavioral homework, that reflected a change from baseline of a medium to large effect, but which was nonetheless nonsignificant according to both statistical analyses.

P08 and P10 who were assigned to 4 weeks of baseline, similarly also displayed differing patterns and levels of self-reported depression during both baseline and treatment phases. As shown in the two middle panels of Figure 9, P08 showed a slight downward slope during baseline, while P10 reported higher levels of depression within an overall upward trend. Mean BDI-II scores for P08 during the treatment phase did not differ from that of baseline, despite considerable variability over the last four sessions that peaked at 35 due to an impending loss in her family. On the other hand, the overall trend for P10 during treatment was a significant decelerating one as assessed by PND reflective of an effective to large effect (see Table 8).

As seen in the last two panels of Figure 9, the two participants assigned to the 5-week baseline phase, P04 and P12, displayed differing patterns and levels of BDI-II scores during this period of time. P04 reported consistently higher levels of depression, with the exception of a sudden decrease in the third week, whereas P12 displayed an accelerating trend that approached the same high level of depression as P04 by the end of baseline. During the treatment phase, P04 generally showed a slow and nonsignificant decrease in her levels of depression. By contrast,

P12 displayed an immediate reduction in depression at the start of treatment that, apart from a spike at week 8, continued in a steady downward and statistically significant trend as assessed by PND.

Value-based protocol. As seen in the first panels of Figure 10, P01 was the only participant of three assigned to the 3-week baseline subgroup who reported a consistently high level of depression at baseline that was maintained throughout the treatment phase. P05 reported a higher level of depression during baseline than P14, but within similar downward slopes. However, their patterns and levels of depression differed during the treatment phase. P05 showed an immediate decrease in depression with the introduction of treatment and despite a slightly upward plateau during the second half of this phase, the overall shift from baseline reflected a very effective to large statistically significant change as assessed by both PND and SMA. By contrast, P14 remained at her baseline level of depression for the first 2 weeks of treatment before displaying a downward trend, constituting a change of medium to large effect size that was nonetheless nonsignificant according to both statistical analyses.

The three participants assigned to the 4-week baseline phase showed differential patterns and levels of depression at baseline. As seen in the middle three panels of Figure 10, while P13 displayed a downward trend during baseline, both P07 and P11 reported stable, albeit differing levels of depression over this phase. During treatment, all three participants displayed significant change relative to baseline of large effect sizes according to PND. However, only P07 maintained a statistically significant decrease in depression as also assessed by SMA (see Table 8).

As presented in the last two panels of Figure 10, the final two value-based participants, P02 and P06, reported fairly stable and comparable levels of depression during their 5 weeks of baseline. P02 initially displayed a slow upward trend during the first 3 weeks of treatment, but a dramatic decrease in self-reported depression at week 9, followed by a gradual acceleration again for the rest of this phase reflective of insignificant change from baseline. By contrast, apart from an initial spike at the beginning of treatment, P06 showed a decelerating trend for the first 3 weeks of this phase to a significantly lower and stable level of self-reported depression as assessed by PND.

Statistical comparisons. As summarized in Table 8, there were no significant protocol differences in the proportion of participants who displayed significant decreases from the baseline to treatment phases in levels of self-reported depression as assessed by either PND or SMA, $\chi^2(1) = .219, p = .64$ [i.e., 3 of 6 mood-based (50%) vs. 5 of 8 (63%) value-based participants]. Similarly, the two protocols also did not differ in the proportion of participants who demonstrated phase changes of at least medium effect sizes, $\chi^2(1) = .049, p = .83$.

Outcome Rating Scale

Weekly scores from both baseline and treatment phases for each participant who received the mood-based and value-based BA protocols are presented in Figures 11 and Figure 12, respectively. An upward trend represents a general increase in quality of life ratings.

Mood-based protocol. P03 and P09 who were assigned to 3 weeks of baseline showed different slopes, despite similar overall levels, in their quality of life ratings during this phase. As seen in the first two panels of Figure 11, P03 reported fairly stable ratings while P09 demonstrated a downward trend over this period of time. During treatment, both participants

displayed a general accelerating slope that reached higher levels for P03, resulting in a significantly large effect size as assessed by both PND and SMA (see Table 9). By contrast, P09 showed more variability in quality of life ratings during the treatment phase with an overall level of nonsignificant change relative to baseline.

As seen in the middle two panels of Figure 11, P08 and P10 displayed both level and slope differences during their 4 weeks of baseline. P08 rated her quality of life as higher and more stable during this phase compared to P10. Both participants reported significant increases in quality of life from baseline to treatment as assessed by PND despite taking somewhat different pathways to get there (see Table 9). Apart from a dip at week 9, P08's elevated ratings were stable throughout treatment, while those of P10 were more variable within an overall accelerating trend.

The last two participants within the mood-based protocol, P04 and P12, both showed fairly stable ratings throughout 5 weeks of baseline, with those for P12 being slightly higher overall despite a dramatic decrease during the last week of this phase. As seen in the last two panels of Figure 11, apart from a sharp increase in week 9, P04 showed a generally slow accelerating slope with the introduction of treatment that resulted in a significant and very effective change as assessed by PND (see Table 9). The effect size for P12 was more modest, but also reflective of significant change that unfolded within a more rapidly accelerating trend over the course of the treatment phase.

Value-based protocol. As seen in the first three panels of Figure 12, P01 reported stable and low quality of life ratings during the 3 weeks of baseline, whereas both P05 and P14 demonstrated slightly upward slopes, with P14 reporting higher overall ratings. During the

treatment phase, both P01 and P05 displayed stable ratings that were not significantly different from their baseline phase. By contrast, P14 evidenced a slow upward trend during treatment that nevertheless failed to rise to the level of a significant change from baseline (see Table 9).

The three participants assigned to the 4-week baseline phase within this protocol displayed differential levels and patterns of quality of life ratings during this period as seen in the middle three panels of Figure 12. Both P07 and P13 reported higher ratings within general accelerating slopes than P11 who demonstrated a downward trend. With the introduction of treatment, all three participants evidenced significant upward trends in their quality of life ratings reflective of effective to large effect sizes (see Table 9) that unfolded at different rates. Both P07 and P13 reported a slow, but steady increase in ratings throughout this phase, while P11 reported a sharp increase after 2 weeks of treatment that continued to increase at a faster rate compared to the other two participants.

As seen in the last two panels of Figure 12, P02 and P06 reported similar rating levels but differing slopes during their 5 weeks of baseline. P02 displayed an overall decelerating trend during this phase, while the more variable ratings of P06 produced no discernible movement overall. Both participants also differed in both levels and patterns of their quality of life ratings during the treatment phase. P02 continued the downward trend of baseline in the first 3 weeks of treatment followed by a dramatic increase at week 9 that was maintained for the rest of the phase that resulted in average ratings not significantly different from those of baseline (see Table 9). By contrast, P06 reported a decreased rating after the first week of treatment followed by a sharp increase a week later that stabilized during midtreatment until accelerating during the last 2 weeks of treatment to yield an overall significant change from baseline.

Statistical comparisons. As presented in Table 9, all but one of the six mood-based participants (83%) reported significant increases in quality of life from the baseline to treatment phases as assessed by either PND or SMA, compared to only half (50%) of the value-based participants. This difference, however, was not significant, $\chi^2(1) = 1.66, p = .20$, nor was that in the proportion of participants from both protocols who demonstrated increased ratings of at least medium effect sizes, $\chi^2(1) = 2.86, p = .09$.

Microlevel Process Analyses

Apart from activity level, the remaining three microlevel process measures of overall mood, enjoyment, and valued-living were evaluated in a manner similar to the microlevel outcome measures by using visual inspection of their graphs supplemented by PND and SMA for analyses of statistical significance and associated effect sizes of changes from the baseline through treatment phases. Given that the ratings for activity level were measured based on changes from the previous week, only PND was calculated for statistical analysis.

Overall Mood

Participants self-reported their weekly overall mood on a scale of 1-10 in both baseline and treatment phases with higher ratings reflecting improvement. Figure 13 presents the ratings of participants from the mood-based protocol, while comparable data from those assigned to the value-based protocol are shown in Figure 14.

Mood-based protocol. As seen in the first two panels of Figure 13, P03 and P09 showed similar levels, but different patterns in their mood ratings during their 3 weeks of baseline. P03 displayed a rising slope despite a lower rating in the second week of baseline, while P09 showed a clear decelerating trend. During treatment, P03 generally reported a slow and nonsignificant

increase in overall mood ratings (see Table 10). By contrast, P09 displayed much more variability, with an initial dramatic increase in ratings upon the introduction of treatment, followed by a sharp downward trend for the next 3 weeks before increasing again, resulting in an overall pattern that did not represent a significant change from baseline.

As presented in the middle two panels of Figure 13, the two participants assigned to 4 weeks of baseline also reported similar mood ratings, but slope differences during this phase. P08 displayed stability compared to P10 who displayed a U-shaped pattern with lower ratings noted in weeks 2 and 3. With the introduction of treatment, they showed differential levels and patterns. P08 reported a slight and nonsignificant increase in mood ratings during treatment that remained fairly stable throughout this phase, whereas P10 demonstrated a significant accelerating slope of large effect size (see Table 10).

P04 and P12 demonstrated differing levels and patterns during their 5 weeks of baseline as seen in the last two panels of Figure 13. P04 reported her overall mood to be lower and more stable over this period of time compared to P12 who displayed a decelerating slope by the end of the phase. Their responses to treatment, however, were more similar as both displayed significant increases in overall mood relative to baseline as assessed by PND although through different pathways. P04 displayed relatively little variability in ratings within a gradual accelerating slope. By contrast, P12 showed more volatility in her ratings within an upward treatment phase trend that was more pronounced and resulted in higher mood ratings than P04.

Value-based protocol. The first three panels of Figure 14 reveal that the three participants assigned to 3 weeks of baseline reported differences in their mood levels and slopes during this phase. P01 and P14 both displayed stable, albeit different levels of baseline mood,

while P05 showed an intermediate mood level within an overall accelerating slope. During the treatment phase, all three participants reported variable mood levels that in the aggregate were not significantly different from those of their baseline phases (see Table 10).

The three participants assigned to the 4-week baseline phase displayed trend and level differences in overall mood during this period of time as seen in the middle three panels of Figure 14. P13 reported a moderate mood level within an accelerating trend, while both P07 and P11 showed relatively more variability in their ratings as well as differences in mood levels. More specifically, P11 displayed an inverted-V during baseline compared to P07 who exhibited less variability and higher overall ratings. During treatment, P07 showed little variability in her mood ratings with no overall change in level from those of baseline. Both P11 and P13 overall reported higher mood levels during treatment than P07, but the change from baseline was only statistically significant for P13, in part due to a great deal of instability in the ratings of P11.

As seen in the final two panels of Figure 14, P02 and P06 showed similar mood rating levels but within different patterns of slope during their 5 weeks of baseline. While P02 showed more variability in ratings within a decelerating slope, P06 demonstrated a pronounced upward trend during baseline. By contrast, their patterns and levels of mood ratings were more similar during treatment with both reporting considerable variability leading to nonsignificant increases over baseline.

Statistical comparisons. As summarized in Table 10, only a minority of participants in each protocol (i.e., 3 of 8 mood-based vs. 1 of 8 value-based) displayed significant increases in mood from the baseline to treatment phases as assessed by either PND or SMA, a proportional difference that was not statistically significant, $\chi^2(1) = 2.36, p = .12$. The proportions of

participants who demonstrated increased ratings of at least medium effect sizes from both protocols were also not significantly different, $\chi^2(1) = 2.86, p = .09$.

Activity Levels

Graphs depicting relative weekly changes in activity levels across baseline and treatment are presented in Figure 15 for mood-based participants and in Figure 16 for those from the value-based protocol. Because participants were asked to rate changes in their activity compared to the previous week according to a 1 (*much lower*) - 10 (*much higher*) scale (see Appendix J), data are displayed in a manner different than those within other graphs. The units of the vertical axis are not labeled insofar as the ratings, unlike the time series data presented in other figures, did not comprise an interval scale. However, apart from the first data point that was arbitrarily set to 0 for comparison purposes, the remaining ratings are indicated along with the plotted weekly data points so that the degree of departure from the previous week reflects how much activity levels increased or decreased since then. For example, a rating of 5 (*about the same*) resulted in no change and a flat line from one week to the next, while a rating of 1 (*much lower*) is reflected by a reduction of 4 units on the vertical axis from the previous data point. Conversely, a rating of 10 (*much higher*) was denoted by an increase of 5 units, a rating of 9 by an increase of 4 and, so on, such that a visual inspection of the graphs in Figures 15 and 16 reveals how much overall change in activity level occurred over the weeks of baseline and treatment. While these time series data were not analyzable with SMA, they were by PND with the findings summarized in Table 11.

Mood-based protocol. As presented in the first two panels of Figure 15, both participants displayed slope/trend differences during both baseline and treatment phases. P03

reported a sharp decrease in activity level during the second week of baseline that was maintained during the third, while P09 demonstrated no change over this period of time. With the introduction of treatment, both participants reported somewhat differing, but nonsignificant increases in activity level by the end of the phase. P03 showed some variability during the first 5 weeks of treatment followed by a sharp increase in the last 2 weeks. Although P09 demonstrated an initial increase in activity levels, this was followed by a decelerating trend before she began to show an accelerating slope during the last 3 weeks of treatment.

P08 and P10 demonstrated opposite patterns during their 4 weeks of baseline as seen in the last two panels of Figure 15, with P08 displaying a decelerating and P10 an accelerating trend. These overall trends continued for both during treatment, resulting in a significant and very effective change from baseline activity levels for P10 (see Table 11).

The two participants assigned to 5 weeks of baseline within this protocol showed similar patterns during both baseline and treatment phases as reflected in the last two panels of Figure 15. Each reported fairly stable activity levels during baseline followed by an accelerating trend after during treatment. This trend was more pronounced, however, for P04 than for P12 in reflecting a significantly effective change relative to baseline.

Value-based protocol. As seen in first three panels of Figure 16, the three participants assigned to 3 weeks of baseline reported relatively stable activity levels during this phase. During treatment, P05 showed a gradual decelerating trend while both P01 and P14 displayed different degrees of accelerating trends. That for P01 represented a statistically significant and very effective change, while that for P14, although reflective of an effective effect size, fell short of being significant according to PND.

The middle three panels of Figure 16 display considerable variability in the stability of activity levels among the three participants during their 4 weeks of baseline. While P13 demonstrated a stable baseline, P07 reported no change during the last week of this phase after recovering from a dip in activity level during the second week. P11 displayed a slightly decelerating slope as a yet third pattern of baseline activity levels. However, all three participants showed a similar overall accelerating trend during treatment phase although at different rates and to varying degrees. Both P07 and especially P11 demonstrated steep and significant upward trends that resulted in effective changes from their activity levels at baseline. By contrast, P13 maintained her baseline level for the first 3 weeks of treatment followed by a gradual and nonsignificant accelerating trend.

The two participants assigned to the 5-week baseline phase within this protocol reported differing trends and activity levels during it. P02 as seen in the last two panels of Figure 16 showed little overall change and relative stability during baseline in contrast to P06 who displayed a pronounced upward trend following an initial dip during the second week. Both, however, showed overall accelerating trends during treatment that constituted statistically significant change for P06 while falling just short attaining this for P02.

Statistical comparisons. As reflected in Table 11, half or less of the participants in the two protocols (i.e., 2 of 6 mood-based and 4 of 8 value-based) reported significant increases in activity level from the baseline to treatment phases as assessed by PND. This difference was nonsignificant, $\chi^2(1) = 0.39, p = .53$, as well as that involving the proportion for whom such changes represented at least effective effect sizes, $\chi^2(1) = 0.22, p = .64$.

Enjoyment

The extent that participants reported enjoying activities is depicted in Figure 17 for those from the mood-based protocol and in Figure 18 for those assigned to the value-based protocol. Following the introduction of homework activities during the second treatment session, participants weekly separately rated their enjoyment in such assignments as well as in other activities that were not identified as homework (see Appendix J). Weekly enjoyment ratings for these two categories of activities were plotted separately within each participant graph and analyzed independently using PND and SMA, with the results summarized in Table 12. Because homework was not introduced until the second week of treatment, enjoyment ratings at the first treatment session were obtained with the same tracking questionnaire administered during baseline that asked about overall activities (see Appendix I). Accordingly, ratings from this first treatment session are included and plotted as the last data point within each graph's baseline phase. For example, four baseline data points are displayed for participants assigned to 3 weeks of that phase, five for those with 4 weeks, and six for those with 5-week long baseline phases.

Mood-based protocol. As seen in the first two panels of Figure 17, P03 and P09 displayed differing levels and patterns in their enjoyment of activities prior to the introduction of homework. The overall level of enjoyment reported by P03 during this time period was lower than that of P09 within a general accelerating trend. By contrast, P09 showed a decelerating trend during the first 3 weeks of baseline followed by a rating spike at the first treatment session, possibly suggestive of a nonspecific effect. With the introduction of homework, both participants demonstrated similar overall levels of enjoyability, but with different degrees of variability within overall upward slopes for both homework and nonhomework-related activities. However of the four patterns for the two participants, only that involving enjoyment of

homework activities for P03 represented a significant change of large effect size as analyzed by both PND and SMA (see Table 12).

P08 and P10, who were assigned to the 4-week baseline condition within this protocol, showed slope and level differences in their activity-enjoyment ratings during this extended phase. P08 reported a higher level of enjoyment during this time period within a slightly accelerating slope, while that of P10 remained fairly stable. As seen in the middle two panels of Figure 17 and in Table 12, both participants displayed significantly large effect size increases in enjoyability of homework activities during treatment as analyzed by both PND and SMA. However, only P10 also displayed equivalent increases in her enjoyment of activities outside of homework.

As seen in the last two panels of Figure 17, the last two participants from the 5-week baseline group within this protocol, P04 and P12, displayed similar slightly upward slopes in their enjoyability ratings prior to the introduction of homework, but with higher overall levels for P04. With the introduction of homework, P04 reported an immediate dramatic increase in enjoyability for both homework and nonhomework activities that was maintained for the duration of treatment and resulted in a significant increase of large effect size for each as determined by both statistical analyses. P12 also reported a statistically significant increase in the overall level of enjoyment from engaging in homework according to both analyses. However, the increase for activities not assigned as homework was only statistically significant as determined by PND, despite a large effect size comparable to that for homework.

Value-based protocol. The three participants assigned to 3 weeks of baseline within this protocol differed from each other in both slopes and levels of their enjoyability ratings during its

extended phase as indicated in the first three panels of Figure 18. P01 displayed lower levels and more stability in her ratings compared to both P05 and P14, who respectively showed accelerating and decelerating slopes. These three also clearly differed from each other during the treatment phase as well. P01 reported higher and more stable ratings for activities assigned as homework, but was the only one to show significant increases in enjoyment for both homework and nonhomework-related activities by at least one of the statistical analyses (see Table 12). By contrast, P14 displayed more stability, but also more modest increases in ratings for both categories of activities that unexpectedly was only significant for enjoyment of those not assigned for homework according to PND. P05 reported no change or reduced enjoyability ratings for the first 2 weeks of homework, followed by overall accelerating trends for the remainder of the treatment phase for both categories of activities that were nonetheless insufficient to result in significant change for either.

The three participants within this group assigned to the 4-week baseline phase and presented in the middle three panels of Figure 18 displayed somewhat different slopes and trends in enjoyability ratings prior to the second week of treatment. P07 reported an overall decelerating slope with higher overall levels of enjoyment relative to the other two whose ratings differed from each other in their stability and patterns during this time period. In particular, P11 showed no discernible trend or slope and much more variability in her ratings compared to a steady, gradual accelerating trend for P13. With the introduction of homework, all three participants reported increased enjoyment of activities, but to somewhat differing degrees and within varied patterns. P13 and especially P11 showed discernible and similar increases in rated enjoyment of both homework and nonhomework-related activities followed by accelerating slopes to the end of treatment that represented significant change in each category of activities

for both of them according to both statistical analyses. By contrast, with the introduction of homework, P07 reported immediate increased ratings of those activities that remained stable throughout treatment, but which constituted a significant change over baseline by SMA only. Also unlike P11 and P13, P07 showed little immediate change in enjoyment of nonhomework-related activities and nonsignificant increases over the course of treatment.

The final two panels of Figure 18 display differing patterns in the enjoyment ratings for P02 and P06 during the 6 weeks prior to the introduction of homework and the 6 weeks that followed. While both reported similar and fairly high levels of enjoyment with overall flat slopes and no discernible trends during the first of these 6-week phases, the ratings for P02 were relatively more stable. This contrasting pattern, however, changed rather dramatically during the second 6-week phase following the introduction of homework. P02 displayed an immediate increase in her enjoyability of assigned activities only, followed by dip a week later, and then an even more dramatic spike with subsequent stability during the last 3 weeks of treatment that represented statistically significant change according to PND. By comparison, P06 reported modest increased ratings for enjoyment of both activity categories with the introduction of homework followed by little and nonsignificant change in either for the rest of treatment.

Statistical comparisons. As summarized in Table 12, all but one participant (83.3%) from the mood-based protocol reported significant increases in enjoyment over baseline levels from activities assigned as homework as assessed by either PND or SMA. The proportion of value-based participants (i.e., 5 of 8 or 62.5%) was somewhat less, but not significantly so, $\chi^2(1) = 0.73, p = .39$. Similarly, there were also no protocol differences found for increased enjoyment of nonhomework, $\chi^2(1) = 0.39, p = .53$ (two-thirds of mood-based participants vs half of value-

based) nor in the proportion of participants who displayed increased enjoyability of at least medium effect sizes in homework, $\chi^2(1) = 0.49, p = .83$, and nonhomework, $\chi^2(1) = 0.81, p = .37$.

Importance

The degree to which activity engagement was considered important by participants is reflected in Figures 19 and 20 for those from the mood-based and value-based protocols, respectively. Because importance ratings were collected with the same tracking questionnaires used in assessing activity-related enjoyment during the extended baseline (see Appendix I) and treatment phases (see Appendix J), data were graphed and analyzed in the same way. That is, ratings from the first treatment session were again included as part of the baseline phase with ratings for homework versus nonhomework activities during the last 6 weeks of treatment separately plotted and analyzed using PND and SMA (see Table 13).

Mood-based protocol. As seen in the first two panels of Figure 19, P03 and P09 who were assigned to the 3-week baseline condition, displayed differing levels and patterns of importance ratings, but within similar slight upward slopes, prior to the introduction of homework. P03 reported an overall lower and more stable level of ratings, while P09 showed more variability with 2 initial weeks of stable ratings followed by a dramatic increase and increase in the last 2 weeks of the extended baseline phase. With the introduction of homework, P03 reported immediate increases in importance ratings for both homework and nonhomework maintained for the rest of the treatment phase that resulted in a significant large treatment effect for both categories of activities as assessed by PND and SMA (see Table 13). By contrast, P09 continued to show volatility in her ratings and demonstrated a deep V-shaped pattern during the

first month of treatment for both categories reflecting nonsignificant overall change from baseline.

As seen in the middle two panels of Figure 19, P08 and P10 each showed no slope, but differing levels of importance ratings during the extended baseline phase. Their ratings remained fairly stable, apart from a spike in week 4 for P08, with P10 reporting an overall higher level. P08 reported an immediate increase in ratings with the introduction of homework maintained for the rest of the treatment phase that represented a significant elevation over baseline as assessed by SMA (see Table 13). By comparison, her importance ratings for nonhomework activities showed a more modest upward slope that fell short of attaining significant improvement. Unlike P08, P10 demonstrated a significant increase in how important she rated engaging in both categories of activities.

The last two participants in this protocol assigned to 5 weeks of baseline, as shown in the final two panels of Figure 19, displayed differences in the slopes and levels of their importance ratings prior to the introduction of homework. In particular, P04 showed a lower level within an overall downward slope, while P12 reported stable ratings. During treatment, both participants reported significantly elevated importance ratings for both categories of activities (see Table 13), with this increase being especially immediate and dramatic for P04.

Value-based protocol. As seen in the first three panels of Figure 20, the three participants assigned to 3 weeks of baseline demonstrated differing levels and trends in their activity importance ratings during the month prior to the introduction of homework. P01 reported a fairly stable, lower level of ratings compared to P05 and P14 who both displayed more moderate levels within similar accelerating trends. All three participants displayed significant

increases in their importance ratings for homework activities during treatment as assessed by PND. The especially dramatic immediate increase for P01 following the introduction of homework also extended to nonhomework activities and resulted in significant improvement within this category as well for him alone.

The importance ratings of the three participants within the 4-week baseline group displayed vastly varied levels and slopes during this phase as reflected in the middle three panels of Figure 20. Both P07 and P11 reported similar elevated levels of importance ratings and with more range compared to more stable and moderate ratings of P13. P07, however, was similar to P13 in displaying little slope during baseline, while P11 showed a downward slope. With the introduction of homework, all three participants immediately reported increased ratings for assigned activities, but P11, unlike P07 and P13, failed to show a similar spike in her ratings of nonhomework activities. During the remainder of the treatment phase, P07 showed little further increases in her importance ratings that nonetheless represented significant improvement over baseline for homework activities according to SMA. By comparison, treatment change for P11 was insignificant for both categories of activities, while for P13 it was significant for both as assessed by both statistical analyses (see Table 13).

As presented in the final two panels of Figure 20, P02 and P06 displayed relatively elevated levels of importance ratings with little slope, but with differing levels of stability, during the 6 weeks of extended baseline. While P02 showed more volatility in her ratings, P06 reported a wider overall range during baseline. Both also displayed different responses to the introduction of homework. P02 reported and maintained an immediate increase in her importance ratings of assigned activities that represented a significant change relative to baseline as assessed by both statistical tests. She did not, however, display a similar immediate, sustained, and significant

increase in her ratings of nonhomework activities during the treatment phase. P06 reported more modestly increased ratings for both categories of activities immediately following the introduction of homework that were either maintained in the case of assigned activities, or even slightly increased for nonhomework activities over the course of treatment. Nonetheless, the degree of change for both categories was nonsignificant according to both PND and SMA. These results, or lack thereof, may be at least in part attributable to a ceiling effect. As seen in Table 13, the mean of baseline ratings for P06 (i.e., 7.50 of a 10-point scale) was higher than that of other participants from either protocol. The mean treatment phase ratings for both homework (7.83) and nonhomework (8.17) increased, but not enough for either to be statistically significant.

Statistical comparisons. As seen in Table 13, a majority of participants in both protocols (i.e., 5 of 6 mood-based and 6 of 8 valued-based) reported significant increases in importance ratings from activities assigned as homework from baseline to treatment phases as assessed by either PND or SMA. While two-thirds of mood-based participants reported increased importance ratings associated with nonhomework-related activities, only 25% of those from the value-based protocol did so. This difference, however, was not significant, $\chi^2(1) = 2.43, p = .12$, nor were those in the proportions who displayed at least medium effect sizes for both homework, $\chi^2(1) = 0.49, p = .83$, and nonhomework, $\chi^2(1) = 1.75, p = .19$.

Macrolevel Mediation Analyses

According to Kazdin (2007) one of the evidentiary requirements of mediational relationships between process and outcome variables is that change in the former precedes improvement in the latter. For this reason, mediational analyses at a macrolevel were limited to

examining protocol differences in the degree to which pre to posttreatment changes in the three process measures (i.e., VLQ as well as PAL frequency and obtained pleasure) predicted therapeutic gains in the four outcome measures (i.e., BDI-II, HRS-D, ORS, and BAI) from posttreatment through follow-up. For ease of interpretation, desired change in the two sets of measures was keyed so that positive correlations reported in Table 14 reflect mediation.

Valued Living Questionnaire

As seen in Table 14, there were no significant relationships between increased valued living from pre to posttreatment and improvement on any of the four outcome measures during follow-up when analyzed for either the entire sample or separately by protocols. Moreover, the correlations between the VLQ and half of the outcome measures were unexpectedly in the opposite direction.

PAL Frequency

Similar to the VLQ, none of the correlations between increased activity levels and treatment outcome were significant when examined for the entire sample or either protocol. The only relationship that was positive for the entire sample and mood-based participants was with interviewer-rated levels of depression as assessed by HRS-D.

PAL Obtained Pleasure

As summarized in Table 14, none of the correlations were once again significant when data were collapsed across all participants or separately for both protocols. The coefficients with HRS-D scores, which were the only ones in the expected direction for all three, were also among the weakest.

Microlevel Mediation Analyses

While the macrolevel mediation analyses investigated the relationship between process and outcome measures on a more molar level, they did not permit the more fine-grained examination of how changes in both variables may unfold over time within single-subject designs. The repeated measurement of both process and outcome variables over the course of a treatment phase within such designs provides a larger data sample, especially when aggregated across all participants and those within a protocol, for determining if changes in purported therapeutic mechanisms of action precede improvement in key outcomes. Moreover, the calculation of time-lagged correlations even creates the possibility of determining how delayed versus more immediate such mediational relationships might be. To address this issue and when feasible, separate sets of time-lagged coefficients between microlevel process (i.e., overall mood, activity level, enjoyment, and importance ratings) and outcome measures (i.e., BDI-II and ORS) were calculated for the entire sample, for each treatment protocol, and also individually for each participant within the two protocols. No correlations for the entire sample and for each protocol were calculated beyond lag 5 for mood and activity levels and beyond lag 4 for enjoyment and importance ratings in order to have at least two pairs of treatment session process and outcome measure data points from each participant. Because paired data from at least three treatment sessions were needed to calculate correlations at the level of individual participants, only up to lag 4 analyses were conducted for mood and activity levels, and up to lag 3 for the other two process variables. Similar to the macrolevel analyses, all desired change was keyed so that positive correlations reported in Tables 15-19 reflect mediation.

Mood

As presented in Table 15, a significant relationship between weekly reports of overall mood and depressive symptoms in the expected direction was found at all time lags, except for lag 2, for the entire sample, indicating that increases in overall mood reliably preceded reductions in self-reported depression by as many as five weekly treatment sessions. This same association held for the value-based protocol, including for lag 2, but did not for the mood-based group with the exception of lag 1. However, the correlations for both protocols only differed significantly at lags 2 ($z = -2.40, p = .02$) and 3 ($z = -2.89, p < .01$).

A significant mediational relationship between increased overall mood and quality of life as assessed by the ORS was found at all lags except at times 2 and 5 for the entire sample. Although a significant correlation was found at lag 2, it was unexpectedly in the opposite direction. While none of the relationships were significant for the mood-based protocol, significant associations between the two variables were found at all time lags for the value-based group. Except at lag 3, the correlations for this group, however, did not significantly differ from those for the mood-based protocol.

At the level of participants, a majority of the relationships between weekly overall mood and depressive symptoms at lags 1-4 were nonsignificant for those within both protocols. As seen in Table 16, only P12 from the mood-based group demonstrated a significant relationship between increased overall mood and decreased depressive symptoms at lag 4, while P02 and P11 from the value-based protocol also showed a significant association between these two variables, but at lag 2. Fewer significant lag correlations were found between weekly overall mood and quality of life. More specifically, none of the relationships were significant for mood-based

participants, and only P01 and P14 from the value-based group demonstrated significant associations between the process and outcome variables at lags 4 and 1, respectively.

Activity Level

Because participants were asked before each treatment session to rate their activity level relative to the previous week, change scores for BDI-II and ORS were paired with them in conducting the lag analyses. That is, outcome measures from a given session were subtracted from the previous week of treatment. As summarized in Table 17, completely unexpected findings emerged as the majority of correlation coefficients reflected weak inverse relationships between activity level and depressive symptoms, especially for the value-based group.

Associations with quality of life were at least in the expected direction at lags 2, 3, and 5 for the entire sample and mood-based participants, but only at lag 2 for the value-based group. None of the correlations, however, differed significantly between the two protocols. As presented in Table 16, only value-based participant, P13, evidenced a significant relationship between increased activity level and enhanced quality of life at lag 2.

Enjoyment

As indicated in the left-hand side of Table 18, unanticipated nonsignificant findings emerged in examining whether increased enjoyment of activities assigned as homework mediated therapeutic change in the two outcome variables. None of the associations for the entire sample and for both groups were significant as expected except for a significant lag 1 correlation for quality of life for value-based participants. In fact, homework-related enjoyment was inversely related to both depressive symptoms as well as quality of life in over half of the analyses for the mood-based protocol.

The overall pattern of lagged correlations suggested a dramatically different relationship between increased enjoyment of nonhomework activities and therapeutic change over the course of treatment. As seen in the right-hand side of Table 18, significant moderate to large relationships between enjoyment and decreased depressive symptoms were found for the entire sample as well as for value-based participants at both lags 1 and 2. All correlations for the mood-based group were insignificant, but not significantly different than those for the value-based protocol.

Differences between the two protocols in the putative mediational role of increased enjoyment of activities not assigned as homework, however, became more delineated in examining its relationship with enhanced quality of life. Correlations for the aggregate sample and the value-based group were statistically significant at all four lags. By contrast, half of the associations for mood-based participant were negative and all were significantly lower than those of their value-based counterparts.

At the level of participants, there were no significant relationships between enjoyment of activities assigned as homework and the two outcome variables for any participant from either protocol. For enjoyment of nonhomework, P12 from the mood-based protocol was the only participant for whom there was evidence of a mediational relationship between it and reduced depressive symptoms (see Table 16). Concerning quality of life, the only significant positive relationship between it and enjoyment of nonhomework activities was found for P02 from the value-based group at lag 1. Mood-based participants P03 and P12 also displayed significant but inverse correlations.

Importance

As summarized in the left-hand side of Figure 19, none of the lagged correlations between the importance of engaging in homework during the treatment phase and either outcome variable were significant when evaluated for the entire sample as well as mood-based participants. By contrast, those for the value-based group were significant except at lag 1, and differed significantly from the mood-based condition at both lags 3 ($z = -2.30, p = .02$) and 4 ($z = -2.16, p = .03$).

Apart from a significant relationship between the importance of homework activities and quality of life at lag 1 for the entire sample, the other associations for it and the mood-based group were nonsignificant. Conversely, there was evidence of a mediational relationship between the two variables at each of the four lags for value-based participants, although the correlations only differed significantly from their mood-based counterparts at lags 3 ($z = -2.82, p = .05$) and 4 ($z = -3.09, p < .01$).

As seen in the right-hand side of Table 18, the overall pattern of relationships between the importance of engaging activities that were nonhomework and the two outcome variables were more as expected, at least at the level of the entire sample. For depression, lagged correlations were significant at time 1 and 2 and for the first three lags for the value-based group. None of the associations between the process variable and decreased symptoms, by contrast, were significant for mood-based participants, although the only significant difference from those of the value-based condition occurred at lag 1.

A similar, but even more pronounced pattern of findings emerged in analyzing the relationship between increased importance of engaging in nonhomework and improved quality

of life over the course of treatment. These two variables were significantly correlated once again at both time 1 and 2 for the entire sample, but now also at all four lags for value-based participants. Moreover, each of these four correlations differed significantly from the nonsignificant relationships identified for the mood-based group.

As with the other mediational analyses at the level of participants, most of those involving the importance of engaging in both sets of activities were not significant, particularly for those within the mood-based protocol. There were no significant relationships in the anticipated direction between this process measure for either type of activities and either outcome measure for this group. By comparison, for the value-based participant P02, reductions in depression were preceded by increased importance ratings for both homework (lag 3) and nonhomework (lag 1) as summarized in Table 16. The same significant lag 1 correlation also occurred for another value-based participant, P11, in addition to one reflecting the same temporal relationship between the importance of nonhomework and increased quality of life.

Summary of Results

A summary of the major findings reported in this chapter that address differences in the two BA protocols are presented in Table 20. It is organized by the results of outcome, process, and mediational analyses conducted at both macro and microlevels.

CHAPTER 5

DISCUSSION

The main focus of this study was to compare the therapeutic efficacy of two different BA protocols while also increasing our understanding of their possible differential mechanisms of action. To do so, a single-subject design was adopted to afford an opportunity to examine treatment effects and any mediational relationships over time between outcome and process variables at both macro and microlevels. The extent that this project effectively and meaningfully achieved its objectives is perhaps best evaluated by considering and discussing its six hypotheses in the context of its overall findings. A summary of these hypotheses and findings related to them is provided in Table 21.

Hypothesis 1: Macrolevel Symptomatic Improvement

It was expected that individuals receiving the value-based protocol would report a greater decrease in their depressive symptoms as assessed by BDI-II than those in the mood-based group, while no similar prediction was made for improvement in either interviewer-rated levels of depression or self-reported anxiety symptoms. As discussed in Chapter 2, an impetus for this project was that no direct comparison between mood and value-based approaches to BA had previously been conducted. The directional hypothesis for self-reported depressive symptoms was based on separate studies that found BATD, which focuses on instigating value-congruent activities, but not Lewinsohn's mood-based BA, reduced self-rated depressive symptoms to a greater degree than supportive therapy (Hopko et al., 2003; Padfield, 1976). There was no similar empirical basis, however, for formulating a directional hypothesis concerning relative reductions in HRS-D and BAI scores.

The prediction of greater reductions in self-reported depression for value-based participants was not supported as there were equivalent statistically and clinically significant improvements for the two groups on BDI-II scores as well as on the other two macrolevel measures of symptomatic improvement. Moreover, despite the absence of any significant differences at either posttreatment or follow-up, the mood-based group displayed relatively greater therapeutic gains on all three outcome variables.

There may be several factors that possibly contributed to the failure to detect any differences between the two protocols on any of the three outcome measures, whether expected or not. Perhaps chief among these is that such comparative analyses were seriously underpowered given the small number of participants in each group and use of nonparametric tests (Siegel, 1956). A larger sample size would be recommended in future research that is primarily focused on comparing the ability of the two approaches to BA to effect symptomatic relief.

A second factor that may have contributed to the absence of any protocol differences in macrolevel symptomatic improvement are possible floor or ceiling effects. In order to explore these possibilities, pre and posttreatment BDI-II means from this project were compared to those from the BA condition of the Seattle study by Dimidjian and colleagues (2006) that also included CT and pharmacological treatment. Means for both the mood (29.13) and value-based groups (27.44) in this project were significantly lower than those in the Seattle study, $M = 33.35$, $SD = 6.65$, at pretreatment, but did not differ from each other at posttreatment (13.83 and 15.50, respectively, compared to 14.79). The collective overall results thus indicate that the BA protocol of the Seattle study attained larger change scores in self-reported depression than those of this project, suggesting that the “dose” of treatment provided in this study may not have been

of sufficient duration or concentration to reveal differential treatment outcomes.

Participants in this study received 8 weekly sessions of treatment totaling 5 hr. By contrast, the BA protocol within the Seattle study consisted of 24 sessions of 50 min each over 16 weeks. Moreover, participants also received a higher concentration of treatment compared to this project with two sessions offered per week during the first 2 months. Thus, over the first 8 weeks of treatment, participants in the Seattle study received over twice as much therapy as those in this project did over this same time span, and four times as much by the end of the protocol.

These comparisons suggest that increasing the “dose” of treatment that participants received in this study in further research might provide a more stringent test of Hypothesis 1. This could be accomplished in at least two ways. The first would be to simply a priori add more sessions per week and/or overall to the treatment manuals of the two protocols along with the inclusion of a larger sample size. An alternative approach, and one more congruent with the spirit of single-subject experiments, would be to incorporate a trials-to-criterion design element (e.g., Wagener, 2012). For example, the number of treatment sessions within the two protocols necessary to reach and maintain a predetermined “therapeutic benchmark” could serve as a primary dependent variable. In evaluating BDI-II scores, this requirement could be attaining one of 13 or below, which represented the criterion for clinically significant recovery in this project, for at least three consecutive treatment sessions.

While no difference between the two protocols in anxiety reduction was expected, the failure to find one might have also been attributable to the same factors involved in the analyses of BDI-II scores. Because Dimidjian and colleagues (2006) did not assess anxiety in the Seattle study, BAI scores collected in this project were compared to those of Hopko and associates (2011) in considering possible floor or ceiling effects. At pretreatment, anxiety levels for the

mood-based group ($M = 24.17$) did not differ from those of cancer patients who received BA in the Hopko et al. project comparing it to problem-solving therapy ($M = 17.10$, $SD = 9.00$), while BAI scores for value-based participants were significantly higher ($M = 26.19$). These same comparative relationships were maintained at posttreatment, reflecting that average pre-post BAI change scores for the value-based group (7.81) were comparable to that of the Hopko et al. sample (6.40), while those for the mood-based protocol (13.00) were greater than both. These findings suggest that the absence of a differential therapeutic outcome in this study cannot be attributed to a floor effect, but don't rule-out possible treatment dosage differences across the two studies. Comparatively, participants in the study by Hopko et al. received six BA sessions of 20 min each over 2 weeks. Thus, while they received less overall treatment than participants in this study (i.e., 2 vs. 5 hr), it was more concentrated, suggesting the need for more systematic parametric research to identify the most cost-effective dosage of BA in reducing symptoms of anxiety.

Like BAI, there was no strong expectation that the two protocols would differ from each other in reduced levels of depression as assessed by HRS-D. The overall findings were as predicted, as both groups were rated as significantly, but equivalently less depressed at posttreatment, with no further reduction during follow-up for either. Unlike the BDI-II and BAI which are self-report measures, no similar cross-study comparisons were conducted on HRS-D ratings due to any differences that might be found likely being at least somewhat attributable to interviewer-related variance.

Hypothesis 2: Macrolevel Quality of Life Enhancement

The second hypothesis that the value-based protocol would improve quality of life more than the mood-based one was predicated on the expectation that a reduction in depressive symptoms leads to improved well-being (Papakostas et al., 2004). Additionally, other values-focused interventions have been found to be effective in improving life quality (Lundgren et al., 2006, 2008; Plumb et al., 2009).

Similar to what was obtained in macrolevel symptom reduction, equivalent statistical and clinical improvements were found on quality of life for both groups, although relatively greater gains were reported by mood-based participants. To the degree that the first two hypotheses were linked in predicting more favorable outcomes for the value-based protocol, the failure to obtain support for Hypothesis 2 in retrospect should not be surprising, given that it was not significantly more efficacious in lowering depression. Again, one possible explanation apart from limited power for the failure to obtain any protocol effect, whether expected or not, is the likelihood of floor or ceiling effects. Given that no studies on BA have used the ORS to assess quality of life improvement, the pre and post treatment ORS means from this project were compared to norms obtained for both nonclinical and clinical samples in the original developmental study for this measure (Miller et al., 2003). The pretreatment means for both the mood (14.65) and value-based groups (17.53) in this project were significantly lower than the nonclinical norms ($M = 28.00$, $SD = 6.80$). However, the mean for the mood-based protocol was also significantly lower than that of the clinical sample ($M = 19.60$, $SD = 8.70$), while this was not the case for value-based participants. Collectively, these pretreatment comparisons suggest that there was sufficient “room” for ORS scores for both protocols to improve over the course of treatment.

Further comparisons at posttreatment, however, also suggest that the degree of improvement by the two groups was not so great that possible differences between them was limited by a ceiling effect. Posttreatment means for both the mood (25.67) and value-based groups (24.95) were lower, but not significantly so, compared to that of the nonclinical sample. The overall findings suggest that the failure to find a difference in quality of life enhancement between the two protocols may be attributable to the same factors that contributed to the nondifferential findings in the analyses of the macrolevel symptomatic improvement. Alternatively, there may simply be no outcome differences at this level between the two BA approaches. Further research with larger samples, larger doses of each, and the possible inclusion of different design elements would be required to provide a more rigorous evaluation of this possibility.

Hypothesis 3: Microlevel Treatment Improvement

Hypothesis 3 was comprised of two parts, with the first anticipating that there would be no protocol differences in the proportion of participants who showed improvement in depression and quality of life during the treatment phase because of the small sample size in this project. The second part posited that value-based participants who showed improvement would display greater therapeutic change than those from the mood-based group. In order to fully examine this hypothesis, it seems useful to separately evaluate its two facets and specify what particular findings may be most germane to each in doing so. Insofar as they can occur independently of each other, it seems most meaningful to define “improvement” as statistically significant decreases in depressive symptoms (see Table 8) and/or increases in quality of life (see Table 9) during the treatment phase as measured by either PMD or SMA, and to assess “therapeutic change” by the related effect sizes.

The first part of the overall hypothesis was supported as the two protocols did not differ from each other in the proportion of participants who showed statistically significant improvement in either outcome variable whether determined by PND or SMA. The second facet of Hypotheses 3, however, was not supported. For example, the mean effect size for the five value-based participants (82.86) who displayed significant decreases in depression during treatment as determined by PND did not differ significantly from that of their three mood-based protocol counterparts (85.71), $U = 6.50, p = .79$. Similarly, no protocol differences were found in comparing mean effect sizes associated with significant reductions of depressive symptoms as assessed by SMA, or for significant improvements in quality of life as assessed by either PND or SMA.

An obvious major impediment to conducting a rigorous test of both facets of Hypothesis 3 was the weak statistical power of the analyses used in evaluating each. The low overall power, in turn, can be explained by the small number of participants and the small number of data points for each. Although the first part of the hypothesis was supported, this finding must be interpreted cautiously given the small number of participants that limited the ability to detect any proportional differences between the two protocols. For example, only one or two participants could deviate from the majority within each protocol (e.g., 1 of 6 vs. 6 of 8) and still obtain a significant chi-square test. The number of participants examined in the second part of the hypothesis was even smaller insofar as it was limited to those who displayed significant improvement during treatment. Increasing the number of participants in subsequent research could enhance the power of analyses while still maintaining an idiographic focus. Single-subject design elements could still be retained with individual data aggregated in conducting group-level analyses.

Increasing the number of participants ideally could be combined with the collection of more repeated measures from each. Due to underpowered statistical tests and the increased likelihood of making Type II errors, any possible protocol differences may be undetected and hence likely underreported. Consistent with a recommendation by Borckardt et al. (2008), 30 data points per phase or more would permit the utilization of more sophisticated and powerful time-series analyses than those used in this project, such as Autoregressive Integrated Moving Average Models. Having more available data points in future research for each participant could be accomplished in at least two ways. The preferred option would be to continue to collect process and outcome measures at each treatment session, but increase their number, which would simultaneously also address therapeutic dosage concerns. Alternatively, more data points could be collected between sessions, perhaps even daily, through the use of electronic devices with internet connection (e.g., smartphone apps and online survey websites such as Qualtrics) even if more sessions were not added to existing treatment protocols (Luxton et al., 2014).

Hypothesis 4: Macrolevel Mediation Effects of Increased Activation on Treatment

Outcomes

It was expected that increased activation, as assessed by the frequency scale of the PAL, would mediate decreased self-reported depressive symptoms for both protocols based on previous findings that suggests activation as a possible mechanism of change (Gaynor & Harris, 2008; Santos et al., 2017), albeit to an even greater degree in the mood-based group. This directional aspect of the hypothesis was based on the rationale that because PAL was designed to assess pleasurable activities, scores would be more likely to be impacted by the mood-based protocol. It was also anticipated that increased activity levels would mediate therapeutic improvement as assessed by both HRS-D and quality of life, but to a lesser extent.

Hypothesis 4 was not supported as increased activation did not significantly mediate improvement on any of the three macrolevel outcome variables, nor on the BAI either even though it was not a focus of this hypothesis. These findings likely can be explained most readily by the lack of sufficient change in both PAL frequency scores, as a putative process measure, and the three outcome variables over the time spans under consideration (i.e., pre to posttreatment and posttreatment to follow-up, respectively). A necessary, but not sufficient requirement, of mediational relationships is that change in a process variable precedes therapeutic improvement. Unexpectedly, no significant change in activity levels was found from pre to posttreatment. However, even if that had been the case, there in effect were no therapeutic gains from posttreatment to follow-up for increased PAL frequency scores to mediate. All four macrolevel outcome measures showed significant improvements from pretreatment to posttreatment that were maintained, but not enhanced during the 2 months of follow-up.

In retrospect, the lack of outcome changes from posttreatment to follow-up perhaps should not be that surprising. Findings from the largest randomized clinical trial for BATD (Hopko et al., 2011) also found that there were no further improvements in depressive and anxiety symptoms and in quality of life through their 12-month follow-up. These collective findings suggest that the overall therapeutic effect attained by behavioral activation more generally during an active treatment phase is maintained, but not further enhanced following its termination. One way to therefore increase the likelihood that there is sufficient therapeutic change for the analysis of hypothesized mediational relationships would be to assess both outcome and process variables at midtreatment as well as at pre and posttreatment. Changes in activity level from pre to midtreatment could then also be correlated with improvement in outcome measures from mid to posttreatment.

More puzzling than the lack of further change in outcome measures during follow-up is the failure of activity levels to increase over the course of treatment. Unfortunately, most other studies that used the PAL were more interested in the correlation of subscales (e.g., social activities, domestic activities) with other constructs and consequently did not report total frequency scores. However, two studies graphically presented frequency means (Roozen et al., 2008, 2009), thereby permitting at least some imprecise comparisons with the data from this project. Visual inspection of these graphs suggests that values from this study were comparable to those of Roozen et al. (2009), but lower than those presented by Roozen et al. (2008).

The absence of increased activity levels cannot be attributed to a ceiling effect as the aggregate pretreatment mean of 1.73 fell near the lower end of the 5-point scale. In short, there was more than sufficient “room” for continued improvement over the course of treatment. Why it did not seem most likely explainable by how the PAL frequency scale is scored. It represents the average of 139 items rated on a 1-5 scale, making it a rather insensitive measure that is difficult to move. For example, if a participant reported increased engagement in 10 different activities with the maximal rating of 5 per activity, the 50 point increase divided by 139 items would result in an increase in the mean of only 0.36. One solution to increase the sensitivity and responsiveness of an activity-related measure to intervention may be to instead examine changes in subscale scores, as other researchers have done, as process variables in mediational analyses.

Hypothesis 5: Microlevel Mediational Effects of Increased Activation on Treatment

Outcomes

Hypothesis 5 posited that increased activation during the treatment phase would similarly mediate a reduction in self-reported depressive symptoms as well as in improvements in quality

of life for both mood-based and value-based participants. No directional hypothesis was made as the single question that assessed activity level on a session-by-session basis (see Appendix J), unlike the PAL, was not specific to mood-enhancing activities.

Similar to what was found at the macrolevel, this mediational hypothesis was also not supported. As summarized in Table 17, increased activity level on a microlevel was unassociated with improvements in depressive symptoms or quality of life during the treatment phase for the entire sample or separately for each protocol. Furthermore, the time-lagged correlations represented on the group level were weak and predominately negative. There are at least three factors that might explain for the lack of expected findings in this study.

As was the case in discussing Hypothesis 4, an initial consideration is whether there were sufficient changes in activity level, as well as in depressive symptoms and quality of life over the treatment phase, for a mediational relationship to even be possible. One way to gauge if the necessary, but not sufficient conditions for mediation were likely met, is to first verify that significant improvement occurred over the course of treatment in both process and outcome variables. Unfortunately, no formal statistical analyses were conducted that specifically examined such microlevel changes during the treatment phase alone. However, because both PND and SMA assessed change during treatment relative to baseline, their findings summarized in Table 11 for activity level and in Tables 8 and 9; for self-reported depression and quality of life, respectively; can at least be regarded as proxy indicators of treatment phase improvement. Among all 14 participants, only 4 (28.6%) who showed significant increases in the process variable of activity level as assessed by the PND also demonstrated significant reductions in depressive symptoms; 1 from the mood-based and 3 from the value-based protocol. Five participants in all (35.7%), with 3 from the value-based protocol, showed significant increases in

both activity level and quality of life. In other words, roughly only one-third of participants showed sufficient changes in both process and outcome variables, thereby limiting the likelihood of attaining statistically significant findings at either the aggregate or protocol levels.

A second factor that might account for the lack of findings supportive of Hypothesis 5 is the low power of the time-lagged analyses reported in Table 17. Even if a higher percentage of participants had displayed necessary change in both activity levels and in one or both outcome measures during treatment, significant findings may still have not been detected due to the relatively small set of paired data points that were available. As discussed in Hypothesis 3, there are two ways that this issue could be addressed in subsequent research. The first is to simply increase the number of participants while retaining the same number of treatment sessions. Secondly, more data points can be collected either by increasing the number of treatment sessions or by collecting additional data between sessions.

A third and final possible consideration that might explain results nonsupportive of increased activity level as a key mechanism of change in BA is simply that there may be other processes that are more instrumental in mediating therapeutic improvements at a microlevel (Santos et al., 2011). This interpretation is supported by similar findings from several other studies. For example, Collado and colleagues (2014), who collected weekly measures for activation (Behavioral Activation for Depression Scale; Kanter et al., 2007) and depressive symptoms (BDI-II) at the start of each BATD session, found that increased activation and decreased BDI-II scores occurred concurrently (i.e., within the same session) on a group-level, suggesting that activation did not precede and thus mediate improvement. Gaynor and Harris (2008) and Manos et al. (2011) found that activation preceded reduced depression in only half of their participants when examined at an individual level. The findings, or lack thereof, from this

and related projects thus collectively suggest that activity level increases during BA typically occur concurrently with reductions in depression. As such, activity levels may be more meaningfully regarded as merely another symptom of depression rather than as a putative mediating variable of therapeutic improvement. To the extent that this is the case, a consideration of other ostensible mechanisms of actions in BA, such as some of the additional process variables also examined in this project, assumes added relevance.

Hypothesis 6: Moderated Mediational Effects on Treatment Outcomes

This last hypothesis broadly postulated that the two protocols would instigate different mechanisms of change due to the different classes of activities activated by each. There were in effect two parts to this hypothesis, with the first anticipating that greater obtained pleasure as assessed by the PAL would be more strongly associated with improvement in the four macrolevel outcome measures for mood-based participants, while increased valued living as indexed by the VLQ, would mediate therapeutic outcomes for the value-based group. The second part of Hypothesis 6 investigated this same question of moderated mediation, but on a microlevel. There was no empirical basis to expect that the strength of mediational relationships at either macro or microlevels would vary as function of differing outcome measures.

As summarized in Table 14, the first macrolevel part of the hypothesis was not supported as changes in the two process measures; specifically, PAL obtained pleasure and valued living; were not significantly associated with improvement in any of the four outcome measures for either protocol. These results can be most readily attributed to a lack of sufficient change in both process and outcome variables. As previously noted in discussing Hypothesis 4, none of the four

outcome variables exhibited further improvement during follow-up, thus providing insufficient therapeutic change that might be mediated by either one of the process variables.

Of the two macrolevel process measures, changes in the VLQ at least had the potential to serve a mediating role for the value-based group as a significant increase occurred from pre to posttreatment. However, PAL obtained pleasure scores did not significantly change over this same time span for either protocol. Like scores on the frequency scale of the PAL, because the pretreatment mean of 2.50 for the total sample also was fairly low, the absence of change in this process variable cannot be attributed to a ceiling effect. Rather, both scales of the PAL appear to lack sufficient sensitivity to change, as discussed earlier in conjunction with Hypothesis 4, due to its many items and scoring. As with the PAL measure of activity levels, obtained pleasure subscale scores would seem to provide more sensitive process variables for examination in future studies, especially if collected at midtreatment in addition to pre and posttreatment.

The second part of the moderated mediational hypothesis received partial support in examining lagged-correlations between session-by-session changes in an array of microlevel process variables (i.e., overall mood as well as enjoyment and importance ratings of activities) and improvements in depressive symptoms during treatment. More specifically, the analyses in the aggregate suggested differing mechanisms of action for the two BA protocols, but in ways that had not been fully anticipated.

As seen in Table 15, increased overall mood at lag 1 mediated improvement in depression for mood-based participants, but was unexpectedly associated to a much stronger degree with therapeutic change for both outcome measures in the value-based protocol. Perhaps even more puzzling though is the absence of evidence that any of the other four microlevel

process variables, particularly the two enjoyment ratings, also represented mechanisms of change in the mood-based group. Because the assessment of overall mood made no reference to activities (see Appendix J), it ostensibly may have been less sensitive in reflecting activity-induced mood enhancement as a central process in mood-based BA. However, increased enjoyment of activities, whether assigned as homework or not, did not mediate improvement in either outcome variable for the mood-based group. Moreover, as indicated in Table 18, the directions of these relationships were opposite from what was anticipated at time lags 3 and 4.

The failure to find essentially any expected mediational effects, apart from that which had been specifically expected, for the mood-based protocol, suggests that processes other than those examined in this project may function as mechanisms of change for this type of BA. In short, the overall findings may reveal more about what does not mediate therapeutic improvement in mood-based BA than what does. Processes perhaps worthy of further examination in additional research may involve more cognitive than affective mechanisms of change. For example, Jacobson et al. (1996) found that decreased negative attributions early in BA was associated with reduced depressive symptoms later in the treatment.

While the overall lack of evidence of mediational relationships at a microlevel involving the mood-based protocol was unanticipated, just the opposite applied to the value-based group. Unexpectedly, increased enjoyment (see Table 18) and importance ratings (see Table 19) of both homework and nonhomework, in addition to enhanced overall mood, were all associated with improvements in depression and quality of life. Most of these significant correlations were also found to be significantly different from those found for mood-based participants, providing further support for moderated mediational effects.

Although the mediational effects of enhanced overall mood for the value-based group were unanticipated, those involving the importance of engaging in activities and related enjoyment can likely explain this finding. Increased engagement in important activities can also contribute to enhanced mood, and perhaps to an even greater degree than participating in those that are fun or pleasant (Steger et al., 2008). For example, going bowling may be an enjoyable activity that improves mood, but doing so as a family event may further elevate mood because of the personal meaning and value attached to it. The same activity may serve multiple functions, but those that are more closely linked to values may be more mood-enhancing. A finding by DesRoches and Willoughby (2013) that increased positive mood mediated the relationship between engagement in valued activities and positive adjustment; such as increased self-esteem, purpose in life, and optimism; would seem to support this formulation. In order to further explore this possibility, compiling daily data points, and more importantly, assessing activity level throughout the day and scheduling the collection of outcome measures at both the end of and the beginning of the day through the use of ecological momentary assessment (Ebner-Priemer & Trull, 2009), might allow for a more refined and rigorous analysis of such purported mediational effects at an idiographic level.

Unexpected mediational effects for enjoyment of nonhomework on reduced depressive symptoms at lags 1 and 2, and on increased quality of life at all time lags for value-based participants, are perhaps the most puzzling findings. These results, for instance, do not appear to be attributable to possible experimenter/therapist bias in instigating activities that were both important and enjoyable for value-based participants. Were this the case, an equally strong mediational effect for enjoyment of activities identified as homework should have occurred. However, this was not found, and strong mediational effects for importance of engaging in both

homework and nonhomework activities lend further support for treatment fidelity. Hence, one possibility is that a generalization or type of contagion effect may have occurred in which enhanced mood experienced by value-based participants from engaging in important activities also led to increased engagement in other enjoyable activities on their own, that were not associated with homework, resulting in improved treatment outcomes.

Integrative Summary

Combining and integrating separate findings specifically related to each of the six hypotheses of this project suggests both similarities and differences between the two BA protocols. The primary equivalence in the two approaches was in their therapeutic outcomes. In general, there were no statistically and clinically significant differences between them in improving self-reported or interviewer-rated depression, self-reported anxiety, or quality of life, at both macro and microlevels of analysis.

Key differences that emerged in comparing the two protocols involved their respective mechanisms of action. In short, the two BA approaches achieved equivalent clinically significant outcomes, but through differing processes that became most apparent at a microlevel of analysis. Several processes including enhanced overall mood, as well as increased enjoyment from and meaningful engagement in activities, were associated with improvements in depression and quality of life for the value-based protocol. By contrast, only increased overall mood mediated reduced depressive symptoms with the mood-based group and to a weaker degree compared to the value-based protocol, suggesting that other key mechanisms of action for mood-based BA, such as reattributions, may simply not have been sufficiently assessed and evaluated.

Study Limitations

Some of this project's limitations, such as the small sample size that resulted in limited statistical power, have already been discussed in the context of reviewing its hypotheses. However, this same shortcoming is also a strength of using a single-subject design in that treatment outcomes can be more confidently attributed to the intervention. In short, external validity may be somewhat compromised, but in favor of increased internal validity. Another advantage of single-subject experiments is that the necessary collection of repeated outcome as well as process measures, as occurred in this project, affords an opportunity to examine mediational relationships in a more granular way (Zettle, in press). As noted earlier in this regard, it would have been preferable in retrospect to have included even more repeated measurement of both sets of variables with a larger sample size. Over time and even across investigators, aggregating enough idiographic data permits analyses at a nomothetic level that may detect patterns and relationships that are more broadly applicable.

There are at least two other project shortcomings that seem worthy of acknowledgement and some discussion. The first of these concerns potential experimenter bias. For practical reasons, this investigator served as the only therapist in this project and was thus not blind to its hypotheses and assignment of protocols to participants. Consequently, the possibility that her actions may have at least unintentionally influenced this study's findings cannot be entirely ruled-out. There are at least two sets of findings, however, that would suggest that any bias may have been rather minimal. One, a treatment integrity check found that both protocols were delivered in adherence to their treatment manuals. These results do not preclude the possibility that bias may have occurred in other contexts and interactions with participants, such as during unrecorded sessions, but, nonetheless, suggest that it unlikely tainted the treatment participants

received in any appreciable way. A more persuasive case against possible bias is provided by the overall lack of findings predicted by this project's hypotheses as only four of six received even partial support. Moreover, the hypothesis that enjoyed the greatest support – involving moderated microlevel mediation – would seem to be the one for which it would be the most challenging to even intentionally generate congruent findings.

A second limitation of this project that merits recognition here is compounded by possible experimenter bias, but is hardly unique to it. Apart from the inclusion of the interviewer-rated HRS-D, this study as well as most, if not all randomized clinical trials on treatment of depression, rely on self-report measures to assess both outcome and process variables. Such assessments are not only vulnerable to experimenter bias, but also to demand characteristics and social desirability (Sallis & Saelens, 2000), particularly when many of the questionnaires, such as the BDI-II, are quite transparent. A solution to this problem is to utilize assessment procedures and techniques that may be less susceptible to such unwanted influences; including implicit measures, such as the implicit relational assessment procedure (Hussey & Barnes-Holmes, 2012); behavioral performance measures (e.g., Hooper & McHugh, 2013); cognitive/attentional measures, such as emotional Stroop tests (e.g., Segal & Gemar, 1997); and physiological recordings (e.g., Wagener, 2012).

Concluding Remarks

As the prevalence of MDD has continued to climb over the last decade, it has become increasingly vital to identify more efficacious ways of treating it. The overall purpose of this study was to compare the relative ability of two BA protocols to effect depressive symptomatic relief as well as enhance quality of life, while also explicating their respective mechanisms of

action. It appears from the overall findings that the central question to be addressed by further research is not whether BA treatment protocols work, insofar as two versions examined in this project were found to be equally efficacious. Rather, the more important issue is in better understanding how each works. Identifying the key mechanisms of actions hopefully can guide the development of more powerful treatment options through adaptations to existing therapeutic components linked to such processes, or if necessary, the creation of new procedures and techniques that move them (Hayes & Hofmann, 2018). The collective findings of this project suggest that the two BA protocols investigated result in equivalent therapeutic outcomes, albeit through differing processes. Perhaps such results, even if in only a modest way, may contribute to the larger endeavor of successfully developing and disseminating more cost-beneficial ways of alleviating the considerable human suffering associated with depression.

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APPENDICES

APPENDIX A

Background Information Questionnaire

As you may recall from the consent form, we would like to obtain some background information about yourself.

1. How old are you? _____
2. What is your date of birth? _____
3. What is your gender? ____ Male ____ Female
4. With which of the following racial groups do you identify? You may indicate more than one.
____ Asian
____ American Indian or Alaskan Native
____ Black or African American
____ Hispanic or Latino/Latina
____ Native Hawaiian or other Pacific Islander
____ White
5. Are you currently taking any medication for treatment of a psychological disorder or psychiatric condition, and if so, for how long have you been taking it?
____ No; go to Question 7.
____ Yes; go to Question 6 (Please specify type of medication and duration):

6. Has there been any change in the dosage of this medication in the last 4 weeks?
____ No
____ Yes
____ Not Applicable
7. Are you currently receiving any counseling/therapy for depression?
____ No
____ Yes
8. Have you ever been diagnosed with what is known as Bipolar disorder, which in the past was referred to as manic depression, or Schizophrenia?
____ No
____ Yes
9. Do you currently have thoughts about wanting to kill or harm yourself?
____ No
____ Yes

APPENDIX B

Beck Depression Inventory-II (BDI-II)

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that describes the way you have been feeling during the **past week, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2. Pessimism

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3. Past Failure

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6. Punishment Feelings

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7. Self-Dislike

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8. Self-Criticalness

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10. Crying

- 0 I don't cry any more than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't

11. Agitation

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

13. Indecisiveness

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

14. Worthlessness

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

15. Loss of Energy

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

16. Changes in Sleeping Patterns

- 0 I have not experienced any change in my sleeping pattern.

1a I sleep somewhat more than usual.

1b I sleep somewhat less than usual.

2a I sleep a lot more than usual.

2b I sleep a lot less than usual.

3a I sleep most of the day.

3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

18. Changes in Appetite

- 0 I have not experienced any change in my appetite.

1a My appetite is somewhat less than usual.

1b My appetite is somewhat greater than usual.

2a My appetite is much less than before.

2b My appetite is much greater than usual.

3a I have no appetite at all.

3b I crave food all the time.

19. Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely

APPENDIX C

Hamilton Rating Scale for Depression (HRS-D)

PLEASE COMPLETE THE SCALE BASED ON A STRUCTURED INTERVIEW

Instructions: for each item select the one “cue” which best characterizes the patient. Be sure to record the answers in the appropriate spaces (positions 0 through 4).

1. DEPRESSED MOOD (sadness, hopeless, helpless, worthless)

- 0 Absent.
- 1 These feeling states indicated only on questioning.
- 2 These feeling states spontaneously reported verbally.
- 3 Communicates feeling states non-verbally, i.e. through facial expression, posture, voice and tendency to weep.
- 4 Patient reports virtually only these feeling states in his/her spontaneous verbal and non-verbal communication.

2. FEELINGS OF GUILT

- 0 Absent.
- 1 Self reproach, feels he/she has let people down.
- 2 Ideas of guilt or rumination over past errors or sinful deeds.
- 3 Present illness is a punishment. Delusions of guilt.
- 4 Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.

3. SUICIDE

- 0 Absent.
- 1 Feels life is not worth living.
- 2 Wishes he/she were dead or any thoughts of possible death to self.
- 3 Ideas or gestures of suicide.
- 4 Attempts at suicide (any serious attempt rate 4).

4. INSOMNIA: EARLY IN THE NIGHT

- 0 No difficulty falling asleep.
- 1 Complains of occasional difficulty falling asleep, i.e. more than 1/2 hour.
- 2 Complains of nightly difficulty falling asleep.

5. INSOMNIA: MIDDLE OF THE NIGHT

- 0 No difficulty.
- 1 Patient complains of being restless and disturbed during the night.
- 2 Waking during the night – any getting out of bed rates 2 (except for purposes of voiding).

6. INSOMNIA: EARLY HOURS OF THE MORNING

- 0 No difficulty.
- 1 Waking in early hours of the morning but goes back to sleep.
- 2 Unable to fall asleep again if he/she gets out of bed.

7. WORK AND ACTIVITIES

- 0 No difficulty.
- 1 Thoughts and feelings of incapacity, fatigue or weakness related to activities, work or hobbies.
- 2 Loss of interest in activity, hobbies or work – either directly reported by the patient or indirect in listlessness, indecision and vacillation (feels he/she has to push self to work or activities).
- 3 Decrease in actual time spent in activities or decrease in productivity. Rate 3 if the patient does not spend at least three hours a day in activities (job or hobbies) excluding routine chores.
- 4 Stopped working because of present illness. Rate 4 if patient engages in no activities except routine chores, or if patient fails to perform routine chores unassisted.

8. RETARDATION (slowness of thought and speech, impaired ability to concentrate, decreased motor activity)

- 0 Normal speech and thought.
- 1 Slight retardation during the interview.
- 2 Obvious retardation during the interview.
- 3 Interview difficult.
- 4 Complete stupor.

9. AGITATION

- 0 None.
- 1 Fidgetiness.
- 2 Playing with hands, hair, etc.
- 3 Moving about, can't sit still.
- 4 Hand wringing, nail biting, hair-pulling, biting of lips.

10. ANXIETY PSYCHIC

- 0 No difficulty.
- 1 Subjective tension and irritability.
- 2 Worrying about minor matters.
- 3 Apprehensive attitude apparent in face or speech.
- 4 Fears expressed without questioning

11. ANXIETY SOMATIC (physiological concomitants of anxiety) such as:
gastro-intestinal – dry mouth, wind, indigestion, diarrhea, cramps, belching
cardio-vascular – palpitations, headaches
respiratory – hyperventilation, sighing
urinary frequency
sweating

- 0 Absent.
- 1 Mild.
- 2 Moderate.
- 3 Severe.
- 4 Incapacitating.

12. SOMATIC SYMPTOMS GASTRO-INTESTINAL

- 0 None.
- 1 Loss of appetite but eating without staff encouragement. Heavy feelings in abdomen.
- 2 Difficulty eating without staff urging. Requests or requires laxatives or medication for bowels or medication for gastro-intestinal symptoms.

13. GENERAL SOMATIC SYMPTOMS

- 0 None.
- 1 Heaviness in limbs, back or head. Backaches, headaches, muscle aches. Loss of energy and fatigability.
- 2 Any clear-cut symptom rates 2.

14. GENITAL SYMPTOMS (symptoms such as loss of libido, menstrual disturbances)

- 0 Absent.
- 1 Mild.
- 2 Severe.

15. HYPOCHONDRIASIS

- 0 Not present.
- 1 Self-absorption (bodily).
- 2 Preoccupation with health.
- 3 Frequent complaints, requests for help, etc.
- 4 Hypochondriacal delusions.

16. LOSS OF WEIGHT (RATE EITHER a OR b)

- | a) According to the patient: | b) According to weekly measurements: |
|--|---|
| 0 <input type="checkbox"/> No weight loss. | 0 <input type="checkbox"/> Less than 1 lb weight loss in week. |
| 1 <input type="checkbox"/> Probable weight loss associated with present illness. | 1 <input type="checkbox"/> Greater than 1 lb weight loss in week. |
| 2 <input type="checkbox"/> Definite (according to patient) weight loss. | 2 <input type="checkbox"/> Greater than 2 lb weight loss in week. |
| 3 <input type="checkbox"/> Not assessed. | 3 <input type="checkbox"/> Not assessed. |

17. INSIGHT

- 0 Acknowledges being depressed and ill.
- 1 Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc.
- 2 Denies being ill at all.

Total score:

APPENDIX D

Structured Interview Guide for the Hamilton Depression Rating Scale – 17 Item Version (SIGH-D-17)

INTERVIEWER

The first question for each item should be asked exactly as written. Often this question will elicit enough information about the severity and frequency of a symptom for you to rate the item with confidence. Follow-up questions are provided for use when further exploration or additional clarification of symptoms is necessary. The specified questions should be asked until you have enough information to rate the item confidently. In some cases, you may also have to add your own follow-up questions to obtain necessary information.

Time period. Although the interview questions indicate that the ratings should be based on the patient's condition in the past week, some investigators using this instrument as a change measure may wish to base their ratings on the previous two to three days. If so, the questions may be preceded by "In the last couple of days..."

Loss of weight item. It is recommended that this item be rated positively whenever the patient has lost weight relative to their baseline weight (i.e., before their current episode of depression), provided that they have not begun to gain back lost weight. Once the patient has begun to gain weight, however, even if they are still below their baseline, they should no longer be rated positively on this item.

Referent of "usual" or "normal" condition. Several of the interview questions refer to the patient's usual or normal functioning. In some cases, such as when the patient has Dysthymia or Seasonal Affective Disorder, the referent should be to the last time they felt OK (i.e., not depressed or high) for at least a few weeks.

Code Number: _____

Interviewer: _____

Date: _____

OVERVIEW: I'd like to ask you some questions about the past week. How have you been feeling since last (DAY OF WEEK)? IF OUTPATIENT: Have you been working? IF NOT: Why not?

| | |
|---|--|
| <p>What's your mood been like this past week?</p> <p>Have you been feeling down or depressed? Sad? Hopeless?</p> <p>In the last week, how often have you felt (OWN EQUIVALENT)? Every day? All day?</p> <p>Have you been crying at all?</p> <p>IF SCORED 1-4 ABOVE, ASK: How long have you been feeling this way?</p> | <p>1. DEPRESSED MOOD (sadness, hopeless, helpless, worthless):</p> <p>0 - absent 1 - indicated only on questioning 2 - spontaneously reported verbally 3 - communicated non-verbally, i.e. facial expression, posture, voice, tendency to weep 4 - VIRTUALLY ONLY; this in spontaneous verbal and non-verbal communication</p> |
| <p>How have you been spending your time this past week (when not at work)?</p> <p>Have you felt interested in doing (THOSE THINGS), or do you feel you have to push yourself to do them?</p> <p>Have you stopped doing anything you used to do? IF YES: Why?</p> <p>Is there anything you look forward to?</p> <p>(AT FOLLOW-UP: Has your interest been back to normal?)</p> | <p>2. WORK AND ACTIVITIES:</p> <p>0 - no difficulty 1 - thoughts and feelings of incapacity, fatigue or weakness related to activities, work or hobbies 2 - loss of interest in activity, hobbies or work - by direct report of the patient or indirect in listlessness, indecision, and vacillation (feels he has to push self to work or activates) 3 - decrease in actual time spent in activities or decrease in productivity. In hospital, pt. spends less than 3 hrs/day in activities (hospital job or hobbies) exclusive of ward chores 4 - stopped working because of present illness. In hospital, no activities except ward chores, or fails to perform ward chores unassisted</p> |

| | |
|---|--|
| <p>How has your interest in sex been this week? (I'm not asking about performance, but about your interest in sex – how much you think about it.)</p> <p>Has there been any change in your interest in sex (from when you were not depressed)?</p> <p>Is it something you've thought such about? IF NO: Is that unusual for you?</p> | <p>3. GENITAL SYMPTOMS (such as loss of libido, menstrual disturbances):</p> <p>0 - absent 1 - mild 2 - severe</p> |
| <p>How has your appetite been this past week? (What about compared to your usual appetite?)</p> <p>Have you had to force yourself to eat?</p> <p>Have other people had to urge you to eat?</p> | <p>4. SOMATIC SYMPTOMS GASTROINTESTINAL.</p> <p>0 - none 1 - loss of appetite but eating without encouragement 2 - difficulty eating without urging (18)</p> |
| <p>Have you lost any weight since this (DEPRESSION) began? IF YES: How much?</p> <p>IF NOT SURE: Do you think your clothes are any looser on you?</p> <p>AT FOLLOW-UP: Have you gained any of the weight back?</p> | <p>5. LOSS OF WEIGHT</p> <p>When rating by history:</p> <p>0 - no weight loss 1 - probable weight loss associated with present illness 2 - definite (according to patient) weight loss 3 - not assessed</p> |
| <p>How have you been sleeping over the last week?</p> <p>Have you had any trouble falling asleep at the beginning of the night? (Right after you go to bed, how long has it been taking you to fall asleep?)</p> <p>How many nights this week have you had trouble falling asleep?</p> | <p>6. INSOMNIA EARLY:</p> <p>0 - no difficulty falling asleep 1 - complains of occasional difficulty falling asleep - i.e., more than 1/2 hour 2 - complains of nightly difficulty falling asleep</p> |
| <p>During the past week, have you been waking up in the middle of the night? IF YES: Do you get out of bed? What do you do? (Only go to the bathroom?)</p> <p>When you get back in bed, are you able to fall right back asleep?</p> | <p>7. INSOMNIA MIDDLE:</p> <p>0 - no difficulty 1 - complains of being restless and disturbed during the night 2 - waking during the night - any getting out of bed (except to Void)</p> |

| | |
|--|---|
| <p>Have you felt your sleeping has been restless or disturbed some nights?</p> | |
| <p>What time have you been waking up in the morning for the last time, this past week?</p> <p>IF EARLY: Is that with an alarm clock, or do you just wake up yourself?</p> <p>What time do you usually wake up (that is, before you got depressed)?</p> | <p>8. INSOMNIA LATE:</p> <p>0 - no difficulty</p> <p>1 - waking in early hours of morning but goes back to sleep</p> <p>2 - unable to fall asleep again if gets out of bed</p> |
| <p>How has your energy been this past week?</p> <p>Have you been tired all the time?</p> <p>This week, have you had any backaches, headaches, or muscle aches?</p> <p>This week, have you felt any heaviness in your limbs, back or head?</p> | <p>9. SOMATIC SYPTOMS GENERAL:</p> <p>0 - none</p> <p>1 - heaviness in limbs, back or head. Backaches, headache, muscle aches. Loss of energy and fatiguability.</p> <p>2 - any clear-cut symptom</p> |
| <p>Have you been especially critical of yourself this past week, feeling you've done things wrong, or let others down?</p> <p>IF YES: What have your thoughts been?</p> <p>Have you been feeling guilty about anything that you've done or not done?</p> <p>Have you thought that you've brought (THIS DEPRESSION) on yourself in some way?</p> <p>Do you feel you're being punished by being sick?</p> | <p>10. FEELINGS OF GUILT:</p> <p>0 - absent</p> <p>1 - self-reproach, feels he has let people down</p> <p>2 - ideas of guilt or rumination over past errors or sinful deeds</p> <p>3 - present illness is a punishment. Delusions of guilt</p> <p>4 - hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations</p> |
| <p>This past week, have you had any thoughts that life is not worth living, or that you'd be better off dead? What about having thoughts of hurting or even killing yourself?</p> <p>IF YES: What have you thought about? Have you actually done anything to hurt yourself?</p> | <p>11. SUICDE:</p> <p>0 - absent</p> <p>1 - feels life is rot worth living</p> <p>2 - wishes he were dead or any thoughts of possible death to self</p> <p>3 - suicidal ideas or gesture</p> <p>4 - attempts at suicide</p> |

| | |
|---|--|
| <p>Have you been feeling especially tense or irritable this past week?</p> <p>Have you been worrying a lot about little unimportant things, things you wouldn't ordinarily worry about? IF YES: Like what, for example?</p> | <p>12. ANXIETY PSYCHIC:</p> <p>0 - no difficulty 1 - subjective tension and irritability 2 - worrying about minor matters 3 - apprehensive attitude apparent in face or speech 4 - fears expressed without questioning</p> |
| <p>In this past week, have you had any of the physical symptoms? READ LIST, PAUSING AFTER EACH SX FOR REPLY.</p> <p>How much have these things been bothering you this past week? (How bad have they gotten? How much of the time, or how often, have you had them?)</p> <p>NOTE: DON'T RATE IF CLEARLY DUE TO MEDICATION (E.G., DRY MOUTH AND IMIPRAMINE)</p> | <p>13. ANXIETY SOMATIC (physiologic concomitants of anxiety, such as GI - dry mouth, gas, indigestion, diarrhea, cramps, belching C-V - heart palpitations, headaches Resp - hyperventilating, sighing Having to urinate frequently Sweating):</p> <p>0 - absent 1 - mild 2 - moderate 3 - severe 4 - incapacitating</p> |
| <p>In the last week, how much have your thoughts been focused on your physical health or how your body is working (compared to your normal thinking)?</p> <p>Do you complain much about how you feel physically?</p> <p>Have you found yourself asking for help with things you could really do yourself? IF YES: Like what, for example? How often has that happened?</p> | <p>14. HYPOCHONDRIASIS:</p> <p>0 - not present 1 - self-absorption (bodily) 2 - preoccupation with health 3 - frequent complaints, requests for help, etc. 4 - hypochondriacal delusions</p> |
| <p>RATING BASED ON OBSERVATION</p> | <p>15. INSIGHT:</p> <p>0 - acknowledges being depressed and ill OR not currently depressed 1 - acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc. 2 - denies being ill at all</p> |

| | |
|---|---|
| RATING BASED ON OBSERVATION DURING INTERVIEW | 16. RETARDTION (slowness of thought and speech; impaired ability to concentrate: decreased motor activity): 0 - normal speech and thought 1- slight retardation at interview 2 - obvious retardation at interview 3 - interview difficult 4 - complete stupor |
| RATING BASED ON OBSERVATION DURING INTERVIEW | 17. AGITATION 0 - none 1 - fidgetiness 2 - playing with hands, hair, etc. 3 - moving about, can't sit still 4 - hand-wringing, nail biting, hairpulling, biting of lips |

TOTAL 17-ITEM HAMILTON DEPRESSION SCORE: _____

APPENDIX E

Beck Anxiety Inventory (BAI)

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

| | Not At All | Mildly but it didn't bother me much | Moderately – it wasn't pleasant at times | Severely – it bothered me a lot |
|-------------------------|------------|-------------------------------------|--|---------------------------------|
| Numbness or tingling | 0 | 1 | 2 | 3 |
| Feeling hot | 0 | 1 | 2 | 3 |
| Wobbliness in legs | 0 | 1 | 2 | 3 |
| Unable to relax | 0 | 1 | 2 | 3 |
| Fear of worst happening | 0 | 1 | 2 | 3 |
| Dizzy or lightheaded | 0 | 1 | 2 | 3 |
| Heart pounding/racing | 0 | 1 | 2 | 3 |
| Unsteady | 0 | 1 | 2 | 3 |
| Terrified or afraid | 0 | 1 | 2 | 3 |
| Nervous | 0 | 1 | 2 | 3 |
| Feeling of choking | 0 | 1 | 2 | 3 |
| Hands trembling | 0 | 1 | 2 | 3 |
| Shaky/unsteady | 0 | 1 | 2 | 3 |
| Fear of losing control | 0 | 1 | 2 | 3 |
| Difficulty in breathing | 0 | 1 | 2 | 3 |
| Fear of dying | 0 | 1 | 2 | 3 |
| Scared | 0 | 1 | 2 | 3 |
| Indigestion | 0 | 1 | 2 | 3 |
| Faint/lightheaded | 0 | 1 | 2 | 3 |
| Face flushed | 0 | 1 | 2 | 3 |
| Hot/cold sweats | 0 | 1 | 2 | 3 |

APPENDIX F

Outcome Rating Scale (ORS)

| |
|-----------------------|
| Subject number: _____ |
| Date: _____ |

Looking back over the last week, including today, help me understand how you have been feeling by rating how well you have been doing in the following areas of your life, where marks to the left represent low levels and marks to the right indicate high levels.

Individually

(Personal well-being)

I-----I

Interpersonally

(Family, close relationships)

I-----I

Socially

(Work, school, friendships)

I-----I

Overall

(General sense of well-being)

I-----I

APPENDIX G

Valued Living Questionnaire

Below are domains of life that are valued by some people. We are concerned with your subjective experience of your quality of life in each of these domains. One aspect of quality of life involves the importance one puts on the different domains of living. Rate the importance of each domain (by circling a number) on a scale of 1-10. 1 means that domain is not at all important and 10 means that domain is very important. Not everyone will value all of these domains, or value all domains the same. Rate each domain according to your own personal sense of importance.

| <u>Domain</u> | not at all important | | | | | | | | | | extremely important |
|--|---------------------------------|---|---|---|---|---|---|---|---|----|--------------------------------|
| 1) Family (other than marriage or parenting) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 2) Marriage/couples/ intimate relationships | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 3) Parenting | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 4) Friendships/social relationship | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 5) Employment | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 6) Education/training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 7) Recreation | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 8) Spirituality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 9) Citizenship/ Community Life | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 10) Physical well- being | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |

Valued Living Questionnaire

In this section, we would like you to give a rating of how consistent your actions are with each value. Everyone does better in some domains than others. We are NOT asking about your ideal in each domain. We want to know how you think you have been doing **during the past week**. Rate each item (by circling a number) on a scale of 1-10. 1 means that your actions have been fully inconsistent with your value and 10 means that your actions have been fully consistent with your value.

During the past week

| <u>Domain</u> | not at all consistent | | | | | | | | | | extremely consistent |
|--|------------------------------|---|---|---|---|---|---|---|---|----|-----------------------------|
| 1) Family (other than marriage or parenting) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 2) Marriage/couples/intimate relationships | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 3) Parenting | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 4) Friendships/social relationship | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 5) Employment | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 6) Education/training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 7) Recreation | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 8) Spirituality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 9) Citizenship/Community Life | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 10) Physical well-being | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |

APPENDIX H

Pleasant Activities List (PAL)

This questionnaire contains a diversity of activities that people sometimes enjoy. Please rate the frequency that you have done each activity in the past 30 days and how enjoyable you found it.

For example "driving a car"

Please rate the frequency and enjoyability of driving a car in the past 30 days. If you drove a car moderately in the past 30 days and you enjoyed it a bit, please complete your answer by selecting number 3 on the frequency scale, and score number 2 on the enjoyability scale, as follows:

| | | Frequency | | | | | Enjoyability | | | | |
|----|----------------|------------|-------|----------|------|-----------|--------------|-------|----------|------|-----------|
| | | Not at all | A bit | Moderate | Much | Very much | Not at all | A bit | Moderate | Much | Very much |
| 1. | Driving a car. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

Several activities mentioned in this questionnaire might not have been performed by you in the past 30 days. We do not expect that you performed all the activities mentioned in the questionnaire. It may even be possible that you have never performed a certain activity. If you did not perform an activity in the last 30 days, or you never performed an activity, please complete your answer by selecting number 1 “not at all” on the frequency scale. In these cases, please also indicate how much potential pleasure you think it would have given to you.

For example "going to the movies"

Imagine that you have not gone to the movies in the past 30 days, while engaging in this activity could have given you moderate enjoyability. Please complete your answer as follows:

| | | Frequency | | | | | Enjoyability | | | | |
|----|----------------------|------------|-------|----------|------|-----------|--------------|-------|----------|------|-----------|
| | | Not at all | A bit | Moderate | Much | Very much | Not at all | A bit | Moderate | Much | Very much |
| 1. | Going to the movies. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

On the next pages you will find several activities. Please fill in your answer according to the above mentioned examples. Some items will contain a cluster of activities illustrated by examples, such as item 5 “Playing board games (monopoly, scrabble, etc.)”. Please rate any form of board games you have played in the past 30 days. Please do not leave any questions unanswered. Do not think too long over a question. There are no right or wrong answers. If you think there are activities missing in the questionnaire, you can write in your own activities, as well as rate the frequencies and enjoyabilities thereof.

Select your responses for these activities

| | Frequency | | | | | Enjoyability | | | | |
|---|------------|------|----------|------|-----------|--------------|------|----------|------|-----------|
| | Not at all | Abit | Moderate | Much | Very Much | Not at all | Abit | Moderate | Much | Very Much |
| 1. Watching TV | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2. Listening to the radio | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3. Listening to music (Spotify, Pandora, Itunes, audiotape, CD, mp3, etc) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 4. Fund raising, organizing events and committee work as a hobby | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 5. Playing board games (monopoly, scrabble, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 6. Charity work or working in the voluntary sector | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 7. Playing cards | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 8. Solving a puzzle | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 9. Reading | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 10. Reading newspapers or magazines | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 11. Singing or playing a musical instrument | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 12. Meditating or doing yoga | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 13. Drawing or painting | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 14. Doing craft work like pottery, leather, weaving, etc | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 15. Knitting, crocheting, embroidery, or fancy needle work | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 16. Keeping a diary or blog | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 17. Photography and filming | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 18. Going fishing | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 19. Gardening, taking care of plants | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 20. Training and / or taking care of my pet | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|
| 21. Working on a collection (stamps, coins, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 22. Re-arranging or redecorating my room or house | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 23. Doing a chore in or around the house | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 24. Doing heavy outdoor work (wood chopping, gardening etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 25. Making / repairing clothes, sewing | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 26. Performing a task at work with others | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 27. Performing a task at work alone | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 28. Visiting my parents, family | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 29. Visiting friends or acquaintances | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 30. Having a meal with friends | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 31. Giving a party | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 32. Having coffee, tea, etc., with friends and acquaintances | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 33. Having houseguests | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 34. Writing a letter or an e-mail | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 35. Chatting with a stranger (in person, or on social media) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 36. Telling something I have experienced | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 37. Talking about my daily pursuits (job or school, politics, hobbies, public affairs, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 38. Attending an official ceremony | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 39. Phone friends or acquaintances | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 40. Meeting someone new | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 41. Counseling someone | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 42. Asking for help or advice | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 43. Visiting people who are sick or in trouble | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 44. Giving massages or backrubs | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 45. Make love | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 46. Hugging someone | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 47. Flirting | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 48. Dating | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 49. Kissing | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 50. Drinking coffee or tea | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 51. Telling someone what I think of him/her | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 52. Watching attractive women or men | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 53. Taking a shower or bath | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 54. Drinking a soft drink | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 55. Smoking a pipe, cigar or cigarette | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 56. Laying or sitting in the sun or on a sun bed | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 57. Just sitting quietly | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 58. Sleeping late | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 59. Taking a nap | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 60. Sitting in an outdoor café/on a terrace | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 61. Going to a barber, hairdresser, or a beautician | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 62. Using cologne, perfume or after shave | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 63. Going to the movies | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 64. Take care of your looks | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 65. Cooking, trying out new recipes | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 66. Baking bread, pie or cookies | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 67. Making snacks | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 68. Going to a restaurant / eat out | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 69. Going to a bar or café | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 70. Going to a concert, play, opera or ballet | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 71. Going to a fair, carnival, circus, amusement park, zoo or rodeo | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 72. Taking a vacation | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 73. Going to parties or receptions | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|
| 74. Going to the grocery store | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 75. Going to the library | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 76. Going to auctions, garage sales etc. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 77. Shopping | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 78. Going to a swimming pool, sauna bath, etc. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 79. Buying something for myself | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 80. Going to lectures or hearing speakers | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 81. Going to a museum or exhibit | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 82. Buying something for someone else | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 83. Traveling solo (moving from place to place in a car, train, bus, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 84. Traveling with a group | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 85. Dancing, ballet, gymnastics, aerobics, etc. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 86. Riding a bicycle, going for a bicycle ride | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 87. Taking a walk | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 88. Talking about sports | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 89. Staying with family | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 90. Doing organized sports (in a club, competition) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 91. Doing unorganized sports (ping pong, soccer, skiing, skating, bowling, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 92. Going to a sports event | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 93. Performing astrology, reading your horoscope | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 94. Visiting caves, waterfalls, scenic wonders | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 95. Excursions and trips (including looking at maps, travel folders, and tour books) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 96. Science hobbies like astronomy and nature study | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 97. Reading or studying history | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 98. Doing things with your neighbors | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 99. Doing things with your child(ren) or grandchild(ren) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 100. Fitness, weightlifting, etc. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 101. Working on computer technology and communication | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 102. Watching movies, videos, DVDs | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 103. Watching sports events on tv | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 104. Playing pool or billiards | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 105. Woodworking activities | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 106. Motor vehicle technique (e.g. repairing or building cars, tuning) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 107. Water polo | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 108. Flying, gliding | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 109. Learning to speak a foreign language | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 110. Travel to a foreign country | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 111. Snow skiing / snowboarding | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 112. Internet (surfing, downloading) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 113. Chatting on the social media platforms (e.g., snapchat, facebook messenger, twitter) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 114. Sending a SMS or MMS | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 115. Riding a motorcycle | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 116. Racing in a car, track racing | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 117. Bungee jumping, sky diving | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 118. Gaming platforms (e.g. Nintendo, X-box, Playstation, Grand Theft Auto, Skyrim) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 119. Performing on a stage (band, dance, comedian, play, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 120. Boating (canoeing, rafting, sailing, catamaran) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 121. Ball sports (soccer, basketball, volleyball, handball, rugby, American football, baseball, softball, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 122. Playing tennis | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 123. Keeping an aquarium | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 124. Keeping a terrarium | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 125. Four wheel drive, quad, cross country motorcycling, SUV, etc | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 126. Going to mass events (house and rave parties) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 127. Water sports (water skiing, jet skiing, (kite)surfing, scuba diving, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 128. Skating (skateboard, longboard etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 129. Playing hockey | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 130. Playing golf | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 131. Writing or telling stories | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 132. Ice skating, roller blade | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 133. Fighting sports | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 134. Jogging | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 135. Trading or selling | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 136. Hiking, camping, picnicking, mountaineering, exploring, etc. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 137. Improving my health (having my teeth fixed, getting new glasses, changing my diet, etc.) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 138. Horseback riding | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 139. Any other activities: _____ | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 140. Any other activities: _____ | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 141. Any other activities: _____ | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 142. Any other activities: _____ | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

9. In the last week, how important was it to you to engage in the activities that were part of your homework?

| | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Not at all important | | | | | | | | | Extremely important |

10. In the last week, how important was it to you to engage in the activities that were not part of your homework?

| | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Not at all important | | | | | | | | | Extremely important |

COPING WITH DEPRESSION



A graduate student in Clinical Psychology is seeking volunteers to participate in a research project that compares two approaches for coping with depression. The study involves weekly sessions for 8 weeks. The first 2 weeks will be one hour sessions and the remaining 6 sessions will be half-hour sessions. Participants who complete all sessions will be contacted 2 months later for follow-up measures.

Participants must be at least 18 and will be screened in a few stages to determine their eligibility. If you are interested, complete an online survey on <https://tinyurl.com/experiencesandbeliefs> to assess your initial eligibility. At the end of the survey, you have the option to be entered in a drawing for a \$40 amazon gift card. For more information, please contact Yvonne Chaw at jxchaw@shockers.wichita.edu or (316) 978-6347.

| |
|---|
| Depression study (Yvonne Chaw 316-978-6347) https://tinyurl.com/experiencesandbeliefs |
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APPENDIX L

Acting on Depression

Depression is one the most common and debilitating of all mental health conditions. Nearly 20% of us will experience depression at some point during our lifetime, and within this year it is projected by the World Health Organization to become the second leading cause of disability worldwide. Comparisons with other psychological approaches, as well as medication, has identified behavioral activation as one of the more effective means of coping with depression. As its name suggests, behavioral activation stresses the importance of systematically re-engaging in a range of activities that are often abandoned in the face of depression.

A project is currently underway in the Department of Psychology at Wichita State University to investigate different variations of behavioral activation in helping individuals better manage and cope with depression. This program being conducted by Yvonne Chaw, a doctoral student in clinical psychology, under the supervision of Dr. Robert Zettle, Director of Clinical Training, seeks volunteer participants who are currently experiencing at least a moderate level of depression.

Those interested in participating in the project will first be asked to complete a brief, online screening survey that assesses their level of depression and obtains some relevant background information. Those who qualify will be contacted with additional information and details about further participating in the treatment phase of this project which consists of 8 weekly, individual sessions following some further assessment.

Our hope is that participants will learn some new strategies for more effectively coping with depression and that the overall findings from this project may also help improve psychological services offered to others who also struggle with it.

Interested individuals 18 or older experiencing a least a moderate level of depression can access the brief screening survey by going to: <https://tinyurl.com/actingwithdepression>.

Questions or requests for further information about this project may be directed to either Yvonne Chaw at jxchaw@shockers.wichita.edu, 316-882-4966 or Dr. Robert Zettle at robert.zettle@wichita.edu, 978-3081.

APPENDIX M

Screening Phase Consent Form

Purpose: You are invited to complete the screening phase of a project that compares two related approaches for coping with depression. The purpose of this initial screening phase is to determine your eligibility to participate in the second or treatment phase of this overall project. If we believe you may benefit from participation in the treatment phase, you will be presented with a second consent form that will describe it in greater detail.

Participant Selection: You are being asked to participate in this screening because you have responded to announcements about this project, are at least 18 years of age, and have indicated in completing an online survey that you wished to be contacted about this and other projects being conducted within the Department of Psychology for which you might be eligible. One of the questionnaires included in the online survey you completed assesses level of depression. Based on your responses to it, we believe that you may be a good candidate for this project and might likely benefit by participating in its treatment phase. In order to do so you also must have normal or corrected-to-normal vision in order to read materials presented on paper or electronically, as well as a sufficient command of English to comprehend the presented material. As many as 30-35 individuals like yourself will be further evaluated during this screening phase to determine their eligibility to participate in the treatment phase of this study.

Explanation of Procedures: If you opt to take part in this phase of the study, you will be expected to complete some additional assessment today as well as possibly in another session scheduled in one week to further ascertain your eligibility to participate in the next or treatment phase of this overall project. In the first session today, you will complete several short questionnaires and a brief interview (e.g., “Are you currently receiving any counseling/therapy...”). The questionnaires and brief interview are expected to take approximately 20 minutes. Based on this assessment, you may be asked to return next week for some further evaluation. At that time, you will be interviewed by another doctoral student in clinical psychology who is assisting with this project. This interview will take about 30 minutes (e.g., “Have you been feeling especially tense...”) and will be audio recorded for later review. In the event that the further evaluation being conducted today does not confirm that you appear to be a good candidate for this project, you will be offered a referral for mental health services within the university or larger community.

Discomfort/Risks: It is possible that you may encounter some mild discomfort in completing the questionnaires and in answering some of the questions during the interview. However, we believe that any discomfort you may experience in completing the screening will be minimal and that it will in all likelihood quickly fade following your completion of it. There are no clear additional costs associated with your participation in this phase of the study other than the time involved in completing the questionnaires and interview. You may minimize any discomfort by discontinuing your completion of the screening at any time without penalty. If you experience greater than mild discomfort during or after completing this phase of the project, you may wish to contact the Counseling and Testing Center, Wichita State University, Wichita, KS 67260-0091, telephone (316) 978-3440 or the Department of Psychology Clinic, telephone (316) 978-

3212; or COMCARE, telephone (316) 660-7540.

Benefits: There are no discernible direct benefits that you can reasonably expect to derive through your completion of this screening phase. You may, however, experience some benefits, such as a decrease in your depressive symptoms and/or improvement in your overall emotional well-being, if you are eligible to participate in the treatment phase of this project and opt to do so.

Confidentiality: Every effort will be made to keep your study-related information confidential. However, in order to make sure the study is done properly and safely there may be circumstances where this information must be released. By signing this form, you are giving the research team permission to share information about you with the following groups:

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Wichita State University Institutional Review Board;

The researchers may publish the results of the study. If they do, they will only discuss group results. Your name will not be used in any publication or presentation about the study.

Refusal/Withdrawal: Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Wichita State University and/or Department of Psychology. If you agree to participate in this study, you are free to withdraw from the study at any time without penalty.

Contact: If you have any questions about this research, you can contact Dr. Robert D. Zettle of the Department of Psychology (Office JB 440; Phone: (316) 978-3081; e-mail: robert.zettle@wichita.edu) or Ms. Jia Hui Chaw of the Department of Psychology (Phone: (316) 978-6347; email: jxchaw@shockers.wichita.edu). If you have questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research and Technology Transfer at Wichita State University, 1845 Fairmount Street, Wichita, KS 67260-0007, telephone (316) 978-3285.

You are under no obligation to participate in this study. Your signature below indicates that:

- You have read (or someone has read to you) the information provided above,
- You are aware that this is a research study,
- You have had the opportunity to ask questions and have had them answered to your satisfaction, and
- You have voluntarily decided to participate.

You are not giving up any legal rights by signing this form. You will be given a copy of this consent form to keep.

Printed Name of Subject

Signature of Subject

Date

Printed Name of Witness

Witness Signature

Date

APPENDIX N

Treatment Phase Consent Form

Purpose: You are invited to participate in the treatment phase of a project investigating two different, but related approaches for coping with depression. While we have good reason to believe that the two approaches are likely to be equally effective in helping individuals like yourself, the two have not been directly compared to each other in any previous research. Knowing how effective each approach is in both an absolute and relative sense should help inform treatment decisions that mental health professionals make in meeting the needs of depressed clients whom they serve.

Participant Selection: You are being invited to participate in this part of the project because you met all of its eligibility requirements during the screening phase. As many as 20-25 other individuals like yourself are expected to participate in the treatment phase of this study.

Explanation of Procedures: If you choose to participate in this phase of the study, you will first be asked before leaving today to complete an online survey that takes approximately 20 minutes. To ensure your anonymity, you will be provided with a code number to identify your survey. You will be asked to provide some demographic information before completing a battery of four questionnaires. Three of them will be questionnaires that you have completed previously, either last week or as part of the earlier and initial online survey. The fourth and new questionnaire will ask you about how bothered you have been recently with symptoms of anxiety (e.g., feeling nervous). Because we are still in the process of further evaluating possible participants for this project, we may be unable to schedule your first treatment session until as long as 3 weeks. If we are able to schedule your first session as soon as next week, you will be asked to complete an online survey including two new questionnaires; one that asks about how often you engage in a list of activities, and how much you enjoy them; and another about your experiences in different domains of your life. If we are not able to schedule your first treatment session for another 2 or 3 weeks from today, we would like to continue to monitor your status during this period of time. In order to do so, an email with a link to another online survey containing some of the same questionnaires you will complete today will be sent out for you to complete each week that elapses between now and the scheduling of your first treatment session.

You will be randomly assigned to receive one of the two treatment approaches for coping with depression that are being evaluated in this study. Both approaches emphasize making some adjustments in the activities we spend our time on as a way of better coping with depression. Accordingly, both approaches will ask you to complete behavioral homework assignments as an important part of the treatment. Both treatment approaches consist of 8 weekly sessions that will be held in the Department of Psychology and conducted by Jia Hui Chaw, a graduate student in the department's doctoral program in clinical psychology, under the supervision of Dr. Robert D. Zettle, Professor of Psychology. The first two sessions will last up to 60 minutes and the next six visits will last up to 30 minutes. At the start of each session, you will be asked to complete several questionnaires. To ensure the integrity of the sessions, one-third of them will be audio recorded for later review. These recordings will only be listened to by Dr. Zettle, Ms. Chaw, or others directly under their supervision to ensure your confidentiality. You will be informed

before a specific session is recorded. If you feel uncomfortable about the recording, you can withdraw your consent for it at any time.

At the conclusion of the 8 weeks of treatment, another assessment session will be scheduled one week later to evaluate your progress over this period of time. You will be interviewed again by the same assistant who did so earlier, with it recorded for later review. As part of the assessment an email with a link to an online survey that includes some questionnaires that you completed previously will be sent for you to complete prior to the interview. This same process will be repeated again 2 months later.

Discomfort/Risks: It is possible that you may encounter some levels of discomfort or distress during the treatment sessions and in completing some of the behavioral homework assignments as well as certain questionnaires and other forms of assessment. You may minimize any such discomfort by choosing to stop participating for any reason at any time without penalty. If you experience greater than mild discomfort during or after participating in the study, you may wish to contact the Counseling and Testing Center, Wichita State University, Wichita, KS 67260-0091, telephone (316) 978-3440; the Department of Psychology Clinic, telephone (316) 978-3212; or COMCARE, telephone (316) 660-7540.

Benefits: Because the two approaches being evaluated in this study have helped others like yourself cope with depression, we have reason to believe that you too might benefit from your participation in this project, although we can not offer this as a guarantee. At a more scientific and less personal level, it is our hope that the results of this study may help inform the development of more efficacious approaches in helping those who struggle with depression better cope with it.

Confidentiality: Every effort will be made to keep your study-related information confidential. Your responses to any surveys and questionnaire will be encoded with a number known only to Ms. Chaw and Dr. Zettle as the co-investigators. No identifying information will be associated with the audiotapes of any treatment session which will only be reviewed by the co-investigators or assistants under their direct supervision. The audiotapes will be kept with all other study-related data and documents in a locked file cabinet for five years. However, in order to make sure the study is done properly and safely, there may be circumstances where study-related information that may be of a personal nature must be released. By signing this form, you are giving the research team permission to share information about you with the following groups:

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Wichita State University Institutional Review Board;

The researchers may publish the results of the study. If they do, they will only discuss group results. Your name will not be used in any publication or presentation about the study.

Compensation or Treatment for Research Related Injury: Wichita State University does not provide medical treatment or other forms of reimbursement to persons injured as a result of or in connection with participation in research activities conducted by Wichita State University or its

faculty, staff, or students. If you believe that you have been injured as a result of participating in the research covered by this consent form, you can contact the Office of Research and Technology Transfer, Wichita State University, Wichita, KS 67260-0007, telephone (316) 978-3285.

Refusal/Withdrawal: Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Wichita State University and/or Department of Psychology. If you agree to participate in this study, you are free to withdraw from the study at any time without penalty.

Contact: If you have any questions about this research, you can contact Dr. Robert D. Zettle of the Department of Psychology (Office JB 440; Phone: (316) 978-3081; e-mail: robert.zettle@wichita.edu) or Ms. Jia Hui Chaw of the Department of Psychology (Phone: (316) 978-6347; email: jxchaw@shockers.wichita.edu). If you have questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research and Technology Transfer at Wichita State University, 1845 Fairmount Street, Wichita, KS 67260-0007, telephone (316) 978-3285.

You are under no obligation to participate in this study. Your signature below indicates that:

- You have read (or someone has read to you) the information provided above,
- You are aware that this is a research study,
- You have had the opportunity to ask questions and have had them answered to your satisfaction, and
- You have voluntarily decided to participate.

You are not giving up any legal rights by signing this form. You will be given a copy of this consent form to keep.

Printed Name of Subject

Signature of Subject

Date

Printed Name of Witness

Witness Signature

Date

APPENDIX O

Treatment Fidelity Evaluation Form

Participant Number:

Session Number:

Please answer the following three questions about the session you have just listened to.

1. Is this session based on the mood-based or value-based treatment manual?

Mood-based

Value-based

2. How confident are you in your response to the above question?

1
Not
confident
at all

2

3
Somewhat
confident

4

5
Moderately
confident

6

7
Extremely
confident

3. To what extent did the therapist follow the manual for this session for the approach indicated in your response to Question 1?

1
Not at all

2

3
Somewhat

4

5
Moderately

6

7
Extremely

APPENDIX P

Adapted Revised Treatment Manual for the Brief Behavioral Activation Treatment for Depression (BATD-R) – Mood-based Protocol

Session One

Session One Key Elements:

1. Collect last baseline measures
 - BDI-II
 - ORS
 - Baseline phase weekly tracking questionnaire
2. Discussion of depression
3. Introduction to treatment rationale
 - What about stressful life events and losses?
4. Important points about the structure of this program

Discussion of depression. This program was designed to help you cope with clinical depression. Specific symptoms of a major depressive disorder may include:

- Feeling sad or down most of the time
- Loss of interest in usual activities
- Significant weight loss or weight gain
- A decrease or increase in appetite
- Difficulty sleeping or sleeping too much
- Feelings of agitation or irritability
- Feeling tired or loss of energy (fatigue)
- Feelings of worthlessness or excessive / inappropriate guilt

- Difficulty thinking or concentrating or making decisions
- Crying spells
- Feeling hopeless
- Suicidal thoughts and/or attempts

Some people can identify stressful life events including loss of a loved one, financial difficulty, or job loss as a reason for their depressive symptoms. However, the specific causes are rarely known. The key to feeling better is not in identifying the root cause because this is nearly impossible, but rather in understanding and changing your depressed patterns of behavior.

Introduction to treatment rationale for behavioral activation. This program uses an approach called behavioral activation. According to this approach, the key to a better life is to develop healthier patterns of behavior where each day contains enjoyable activities that help you feel better by increasing more pleasant experiences in your life. Once you have identified activities that you enjoy doing, we will begin to select about 15 activities from that list and plan these activities into your daily schedule. This is important because when you engage in enjoyable activities, it will improve how you feel and think about your life. It is difficult to feel depressed and hopeless if you are regularly doing activities that bring you a sense of pleasure.

This program targets changing your behavior as a method for improving your thoughts, mood, and overall well-being. Many individuals with depressive symptoms often feel tired and lack the motivation to do various activities; thinking that once they have more energy and think more positively, they will be able to do the activities they have ignored or have been unable to accomplish in the past. The opposite approach is taken in this program – behavior is changed first as a way to increase energy and motivation, as well as positive thoughts and feelings. The focus on behavior change, however, does not mean that we ignore thoughts and feelings.

Instead, we suggest that negative thoughts and feelings will change only after you change your behavior and are having more pleasant life experiences.

You should know that it is possible for you to be active, yet still be depressed. This can happen if you feel overwhelmed with activities that are unpleasant. For example, although you may be busy at work and home, these activities may not be enjoyable to you. When you continue to engage in activities that are not rewarding or pleasurable, it may result in feelings of dissatisfaction, low mood, and decreased energy. Thus, it is not only important to have many activities in your life, but specifically to have activities that bring you some degree of pleasure.

What about stressful life events and loss in your life? Often people who have experienced stressful life events and loss end up having long-standing difficulties with depression. After something very bad has happened or loved ones are lost, life can feel empty, or meaningless. It can feel as if there is very little to live for and that all the support and happiness you once had is gone forever. Thoughts and bad dreams may keep coming back about the bad experience or about the loved one who has passed away. I would like to spend some time talking about events in your life that have led to your depressive symptoms, how you felt about those events, and most importantly, how they affect your life now.

(After talking about participant's stressful life events) Nobody can change events of the past, but we can plan for a better future by what we do today. Often after a loss or stressful life event, people change how they spend their time, and this can lead to depressed behavior patterns. For example, you might find it difficult to sleep at night, and so you spend a lot of time sleeping during the day. If you sleep during the day, you may be unable to engage in pleasant/enjoyable activities. The goal of this program is to help you clarify how you want to live your life moving forward and make the best life possible for yourself.

Important points about the structure of this program. Before we finish today, it is important to understand that this is a structured program. This means that this program involves a series of steps. Depression is a problem that builds over time, so it is not possible to learn how to more effectively deal with it in a few days or after just one or two visits. It takes some work and it is very important to practice all of the strategies we will review in this program. Although you may notice some immediate benefits in the first few sessions, only coming to a small number of sessions may not be helpful in the long-term. Consider the example of cancer treatment. Attending regular chemotherapy sessions is essential to completely eliminating the cancer. Coming to only half of your chemotherapy sessions or just one or two might slow the cancer down temporarily, but it is likely to come back unless the full course of treatment is delivered. Skipping several weeks between chemotherapy sessions could also slow the treatment effect, making you vulnerable to cancer returning or only partially remitting. The cancer would continue to grow between sessions, and only worsen. Although it might seem very different, the treatment for depression requires the same structure and consistent attention. For this reason, we ask that you commit to try to come to all scheduled sessions. We realize that sometimes unforeseen events can arise that might cause you to miss a session, and this is understandable, but we urge you not to cancel a session because you are feeling depressed, tired, or unmotivated. Most people find that even when they are feeling depressed before a session, they are likely to feel much better after the session. This idea of motivating yourself to take positive steps like attending treatment sessions even when you are feeling depressed, tired, or unmotivated is an approach that will help you tremendously in this program and in overcoming depression. However, you can choose to leave this program at any point of time if you decide not to continue participating in this research.

In addition to the importance of regular attendance, these sessions will include assignments for you to complete during our session and assignments for you to work on at home. Completing the homework assignments is very important for progress as we find that people who regularly complete them see the most improvement in their lives. If you find any homework assignments difficult or overwhelming, we can discuss this and come up with ways to make it easier for you to do. It is very important that we work together to make sure that this process feels comfortable and useful to allow you to complete these important assignments.

Session Two

Session Two Key Elements:

1. Collect measures
 - BDI-II
 - ORS
 - Baseline phase weekly tracking questionnaire
2. Activity Selection and Ranking Form (Form 1)
3. Daily Monitoring Form (Form 2)

Collect measures - (1) BDI-II, (2) ORS, and (3) Baseline phase weekly tracking questionnaire. We will collect some information at the beginning of each session. Please complete this set of questionnaires.

Pleasant Activities List (PAL). An essential step in this program involves thinking about what activities you enjoy doing. One of the questionnaires that you had completed online prior to beginning this program included a range of activities that people reported as being enjoyable for them. You had rated how often you engaged in the activities in the last 30 days as well as how much you enjoyed each one, or how much you believe you would have enjoyed any activities that you had not engaged in. I would like us to review your responses to that questionnaire together to better understand the types of activities that can give you more pleasurable experiences. In order to correctly identify activities that can maximize your level of enjoyment for the rest of this program, we will focus on those that you had rated as a 4 (*much*) or 5 (*very much*) in terms of their enjoyability for you. What do you enjoy about these activities? Apart from these activities, are there other activities that you enjoy, but that were not reflected in this questionnaire?

Activity selection and ranking (Form 1). Remember that this program is about developing healthy behavior patterns by engaging in activities that improve your mood every day. Today's session will focus on identifying such enjoyable activities. By now, you will have identified many activities that are enjoyable. We will select 15 activities to use as a starting point. As you select an activity, add it to the left column of Form 1 (Activity Selection and Ranking). When selecting activities it is important to remember that the activity should be both observable by others, measurable, broken into its smallest part, as well as enjoyable. For example, if an activity is going for a bike ride, consider that a number of intermediate steps are required before one can do this. Such steps might include, bringing the bike up from the basement, checking the air in the tires, finding a tire pump, pumping the tires, etc. So the first step in the activity of going for a bike ride might just include checking that the bike is in good shape, with later weeks including the actual ride. The more your daily activities are experienced as pleasurable, the more likely you will notice an improvement in your mood.

Once you have your 15 activities listed on Form 1, rank them from 1 (easiest to accomplish) to 15 (hardest to accomplish) in the right column of Form 1. One way to do this is to first identify the easiest and assign it a 1, and then identify the most difficult and assign it a 15. From there, try to fill in the others. In activity planning, you will start with the easiest activities and gradually work towards the more difficult ones.

Daily monitoring with activity planning (Form 2). Once you have identified the 15 target activities, you will need a plan for how you will include these activities in your daily schedule and how you will monitor your progress. We will use Daily Monitoring Forms for the upcoming weeks to help you plan your new activities. Your opinion will be critical in deciding how many activities to select and it is important that you challenge yourself without becoming

overwhelmed. The simplest approach is usually to start with 1-3 of the easiest activities. We will begin now by identifying activities for the coming week and entering these activities into the blank Daily Monitoring Forms for the days that you plan to do them. For example, if your activity is “solving a puzzle” you might enter that activity (Form 2) on Monday, Wednesday, and Thursday.

Be sure to seriously consider whether you are ready for a particular activity and consider barriers that you might encounter. If you are not ready, you may wait for another week to do it. If there are barriers to doing the activity, we should discuss steps you might take to first overcome those barriers. It is important to break activities down into the smallest pieces possible. When you run into difficulty with an activity it can be useful to consider if you really have broken the activity down far enough. For example, if your activity is to go to the gym twice a week, you first might have to buy clothing, research gyms, find a partner to go to the gym with, or arrange for transportation. In this case, “going to the gym” may not be the smallest piece of this activity.

During the upcoming week, you will complete the Daily Monitoring Form by circling the planned activities that were completed. Strike out the activities that were not completed on the scheduled day and try to re-plan the missed activity for another time that week. We will review your Daily Monitoring Form next week and address whatever challenges arise if you have problems accomplishing any of the activities you planned.

Homework:

Complete Daily Monitoring Form and activities listed on it.

Sessions Three - Seven

Session Key Elements:

1. Collect measures
 - BDI-II
 - ORS
 - Treatment phase weekly tracking questionnaire
2. Review homework
 - Discuss challenges to completing the planned activities
3. Plan and assign new homework

Collect measures - (1) BDI-II, (2) ORS, and (3) Treatment phase weekly tracking questionnaire. Before we start the session, we will need to complete this set of questionnaires.

Review of homework. Let's review your Daily Monitoring Form for the week.

Discussion on the completion of activities. How many of the planned activities did you accomplish? For those that you accomplished, how easy or difficult were they? How did you feel about having accomplished those activities? Are you finding that you feel better when you are more active? If so, this is good progress. Would you like to continue those activities or select different ones for next week?

Discussion to have if there are activities that are not completed. Were there activities that you planned that you did not accomplish? If so, what stood in the way of you completing the activities? Was it because you really do not find the activity to be enjoyable? If this is true, then one option is to select a different activity instead. If it is an activity that you want to keep trying to do, then there are a few other issues to consider. Was the activity more difficult to accomplish than what you originally had expected? If so, we can discuss breaking it into smaller

steps as we have discussed previously. Alternatively, you might have felt you just ran out of time and couldn't complete this activity. We can revisit your monitoring forms and think about ways to fit new activities into your schedule. You might also have to seriously consider strategies for reducing your time spent in less pleasurable current activities to make more time for these new more enjoyable activities. This may include the difficult task of setting stricter boundaries around your time. In this case, we can discuss how to plan some activities to help set those boundaries and reclaim some time for yourself. Although these types of changes in your daily routine may be difficult, the planning and monitoring in this program can help reduce currently unpleasant activities and to get you doing more enjoyable new activities.

Plan and assign new homework. Based on our discussion this session, you should now plan your activities for the next week. Dealing with depression is a process, and as you begin to feel better, your plans for yourself may change. You might find it easier to be more active and set increasingly difficult activity goals. On the other hand, you might feel that your original plan was too difficult and have new ideas on how to reduce the difficulty of your activities. Do not feel stuck with your original plan, because it is always open to change. The important thing is that you are increasing your activity level and as you do this, your depression is improving. It is impossible to live an active and enjoyable life and be depressed at the same time. The idea is to increase the amount of time you spend in enjoyable activities so that this is what your life is about instead of your life being about depression. If you are able, try to plan for one or more new activities for the upcoming week in addition to the activities you accomplished the previous week.

Homework:

Complete Daily Monitoring Form and activities listed on it.

Session Eight

Session Eight Key Elements:

1. Collect measures
 - BDI-II
 - ORS
 - Treatment phase weekly tracking questionnaire
2. Review homework
3. Preparing for the End of Study

Collect measures - (1) BDI-II, (2) ORS, and (3) Treatment phase weekly tracking questionnaire. Please complete this set of questionnaires.

Review homework. Let's review your Daily Monitoring Form for each day last week. Are you finding that you feel better when you are more active? If so, this is good progress. If not, make sure that your activities are highly enjoyable. Sometimes people will increase their activities, but find that the activities they selected do not feel as enjoyable as they first assumed.

Are you finding it is difficult to accomplish the activities you planned? If so, you might consider breaking those activities into smaller steps. Think about small steps that can be accomplished that move you closer to the larger, more difficult activity.

Preparing for the end of the study. We have done a lot of work together throughout this program and you have accomplished so much. At this point, you have learned a number of skills that can help you feel better and live healthier when you begin to feel depressed again. Should depressed feelings return it will be helpful to practice all of the skills again, and you might consider continuing to do the skills and monitoring as a part of your life regardless of how you feel!

Finally, it is important to remember that depression cannot exist when you live a life engaged in enjoyable activities. No matter what has happened to us in the past, it is possible for every one of us to make changes to our lives, to make the best of our circumstances, and spend our time doing activities that give us as much enjoyment as possible. Please be reminded that you will be contacted again one week and two months after today to complete another set of questionnaires and interviews.

List of Forms

Form 1. Activity Selection and Ranking Form

Form 2. Daily Monitoring Form

Form 1

Activity Selection and Ranking Form (Mood-based Protocol)

Instructions:

1. List 15 activities from the PAL that you identified as enjoyable.
2. Rate the difficulty of each activity from 1 = least difficult to accomplish to 15 = most difficult to accomplish.

| ACTIVITY | RANK |
|-----------------|-------------|
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Form 2

Daily Monitoring Form (Mood-based Protocol)

Instructions:

1. Circle each planned activity that you completed as part of your homework.
2. If you did not complete the activity, try to re-plan the missed activity for another day in the week.

| Day/date | Activities |
|-----------------|-------------------|
| | |
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| | |

APPENDIX Q

Adapted Revised Treatment Manual for the Brief Behavioral Activation Treatment for Depression (BATD-R) – Values-based Protocol

Session One

Session One Key Elements:

1. Collect last baseline measures
 - BDI-II
 - ORS
 - Baseline phase weekly tracking questionnaire
2. Discussion of depression
3. Introduction to treatment rationale
 - What about stressful life events and losses?
4. Important points about the structure of this program

Discussion of depression. This program was designed to help you cope with clinical depression. Specific symptoms of a major depressive disorder may include:

- Feeling sad or down most of the time
- Loss of interest in usual activities
- Significant weight loss or weight gain
- A decrease or increase in appetite
- Difficulty sleeping or sleeping too much
- Feelings of agitation or irritability
- Feeling tired or loss of energy (fatigue)
- Feelings of worthlessness or excessive/inappropriate guilt

- Difficulty thinking or concentrating or making decisions
- Crying spells
- Feeling hopeless
- Suicidal thoughts and/or attempts

Some people can identify stressful life events including loss of a loved one, financial difficulty, or job loss as a reason for their depressive symptoms. However, the specific causes are rarely known. The key to doing better is not in identifying the root cause because this is nearly impossible, but rather in understanding and changing your depressed patterns of behavior.

Introduction to treatment rationale for behavioral activation. This program uses an approach called behavioral activation. According to this approach, the key to a better life is to develop healthier patterns of behavior where each day contains important activities that help you feel fulfilled and add meaning and purpose to your life. Once you have identified the areas of your life you want to focus on and what matters most to you within those areas, we will begin to identify and plan daily activities that help you to live according to what is most important to you. This is critical because when you accomplish activities that are closely linked to what you care most about in life, it will improve how you feel and think about your life. It is difficult to feel depressed and hopeless if you are regularly doing activities that you feel are meaningful and worthwhile.

This program targets changing your behavior as a method for improving your thoughts, mood, and overall well-being. Many individuals with depressive symptoms often feel tired and lack the motivation to do various activities; thinking that once they have more energy and think more positively, they will be able to do the activities they have ignored or have been unable to accomplish in the past. The opposite approach is taken in this program – behavior is changed

first as a way to increase energy and motivation, as well as positive thoughts and feelings. The focus on behavior change, however, does not mean that we ignore thoughts and feelings. Instead, we suggest that negative thoughts and feelings will change only after you change your behavior and are having more life experiences connected to what matters most to you.

You should know that it is possible for you to be active, yet still be depressed. This can happen if you feel overwhelmed with activities that are unfulfilling or forced by others. For example, although you may be busy at work and home, these activities may be focused only on helping others such that your own needs and feelings are completely neglected. Focusing entirely on the needs of others may result in feelings of emptiness and dissatisfaction, followed by confusion and guilt for having such feelings. Thus, it is not only important to have many activities in your life, but specifically to have activities that bring you some degree of fulfillment.

What about stressful life events and loss in your life? Often people who have experienced stressful life events and loss end up having long-standing difficulties with depression. After something very bad has happened or loved ones are lost, life can feel empty, or meaningless. It can feel as if there is very little to live for and that all the support and happiness you once had is gone forever. Thoughts and bad dreams may keep coming back about the bad experience or about the loved one who has passed away. I would like to spend some time talking about events in your life that have led to your depressive symptoms, how you felt about those events, and most importantly, how they affect your life now.

(After talking about participant's stressful life events) Nobody can change events of the past, but we can plan for a better future by what we do today. Often after a loss or stressful life event, people change how they spend their time, and this can lead to depressed behavior patterns. For example, you might find it difficult to sleep at night, and so you spend a lot of time sleeping

during the day. If you sleep during the day, you may be unable to perform important daily activities or activities that are important to you. The goal of this program is to help you clarify how you want to live your life moving forward and make the best life possible for yourself.

Important points about the structure of this program. Before we finish today, it is important to understand that this is a structured program. This means that this program involves a series of steps. Depression is a problem that builds over time, so it is not possible to learn how to more effectively deal with it in a few days or after just one or two visits. It takes some work and it is very important to practice all of the strategies we will review in this program. Although you may notice some immediate benefits in the first few sessions, only coming to a small number of sessions may not be helpful in the long-term. Consider the example of cancer treatment. Attending regular chemotherapy sessions is essential to completely eliminating the cancer. Coming to only half of your chemotherapy sessions or just one or two might slow the cancer down temporarily but it is likely to come back unless the full course of treatment is delivered. Skipping several weeks between chemotherapy sessions could also slow the treatment effect, making you vulnerable to cancer returning or only partially remitting. The cancer would continue to grow between sessions, and only worsen. Although it might seem very different, the treatment for depression requires the same structure and consistent attention. For this reason, we ask that you commit to try to come to all scheduled sessions. We realize that sometimes unforeseen events can arise that might cause you to miss a session, and this is understandable, but we urge you not to cancel a session because you are feeling depressed, tired, or unmotivated. Most people find that even when they are feeling depressed before a session, they are likely to feel much better after the session. This idea of motivating yourself to take positive steps like attending treatment sessions even when you are feeling depressed, tired, or unmotivated is an

approach that will help you tremendously in this program and in overcoming depression.

However, you can choose to leave this program at any point of time if you decide not to continue participating in this research.

In addition to the importance of regular attendance, these sessions will include assignments for you to complete during our session and assignments for you to work on at home. Completing the homework assignments is very important for progress as we find that people who regularly complete them see the most improvement in their lives. If you find any homework assignments difficult or overwhelming, we can discuss this and come up with ways to make it easier for you to do. It is very important that we work together to make sure that this process feels comfortable and useful to allow you to complete these important assignments.

Session Two

Session Two Key Elements:

1. Collect measures
 - BDI-II
 - ORS
 - Baseline phase weekly tracking questionnaire
2. Life Values and Activities Inventory Form (Form 1)
3. Activity Selection and Ranking Form (Form 2)
4. Daily Monitoring Form (Form 3)

Collect measures - (1) BDI-II, (2) ORS, and (3) Baseline phase weekly tracking questionnaire. We will collect some information at the beginning of each session. Please complete this set of questionnaires.

Life Values and Activities Inventory (Form 1). An essential step in this program involves thinking about what is most important to you within different areas of your life. Stated somewhat differently, we want to identify your values in each of these areas. A value is an ideal, quality, or strong belief in how you want to live your life. In other words, what is most important to you about each of these life areas? What are you striving to be in each life area? What are the qualities of that life area that are important to you? A value is something that is important to you, in your heart, about that life area. Be sure that the values you identify are very personal to you, and not necessarily those of other people in your life or society in general.

1. Family relations. What sort of brother/sister, son/daughter, uncle/aunt do you want to be? What personal qualities would you like to bring to those relationships? What sort of relationships would you like to build? How would

- you interact with others if you were the “ideal you” in these relationships?
2. Marriage/couples/intimate relations. What sort of partner would you like to be in an intimate relationship? What personal qualities would you like to develop? What sort of relationship would you like to build? How would you interact with your partner if you were the “ideal you” in this relationship?
 3. Parenting. What sort of parent would you like to be? What sort of qualities would you like to have? What sort of relationships would you like to build with your children? How would you behave if you were the “ideal you”?
 4. Friendships/social life. What sort of qualities would you like to bring to your friendships? If you could be the best friend possible, how would you behave towards your friends? What sort of friendships would you like to build?
 5. Employment. What do you value in your work? What would make it more meaningful? What kind of worker would you like to be? If you were living up to your own ideal standards, what personal qualities would you like to bring to your work? What sort of work relations would you like to build?
 6. Education/training. What do you value about learning, education, training, or personal growth? What new skills would you like to learn? What knowledge would you like to gain? What further education appeals to you? What sort of student would you like to be? What personal qualities would you like to apply?
 7. Recreation. What sorts of hobbies, sports, or leisure activities do you enjoy? How do you relax and unwind? How do you have fun? What sorts of activities would you like to do?
 8. Spirituality. Whatever spirituality means to you is fine. It may be as simple as

communing with nature, or as formal as participation in an organized religious group. What is most important to you in this area of life?

9. Citizenship/ community life. How would you like to contribute to your community or environment; e.g. through volunteering, or recycling, or supporting a group/ charity/ political party?
10. Physical well-being. What are your values related to maintaining your physical well-being? How do you want to look after your health, with regard to sleep, diet, exercise, smoking, alcohol, etc? Why is this important?

Activities. A primary goal of this session is to select activities that you can do to actually live according to your identified values. Each activity should be something that you might do to live consistently with the value that you identified. For example, if “being a good husband/wife” is important to you, list some activities that you see as consistent with being a good husband/wife (e.g., planning a date once a week or helping your husband/wife with a household chore she/he dislikes). An acceptable activity should be observable, measurable, and broken into its smallest piece. For example, if an activity is going for a bike ride, consider that a number of intermediate steps are required before you can do this. Such steps might include, bringing the bike up from the basement, checking the air in the tires, finding a tire pump, pumping the tires, etc. So the first step in the activity of going for a bike ride might just include checking that the bike is in good shape, with later weeks including the actual ride.

Sometimes it is tempting to select very difficult activities for which the benefits are in the future and not a guarantee. For example, getting a college degree is an important long-term goal that may take some time to achieve. It’s even more important to include activities that get you to the goal, but are important on a daily basis such as studying a topic you enjoy or having a

discussion about something you learned in a class. Many values require a lifelong effort (e.g., being a good parent) where you constantly try to live in a way that is consistent with what's most important to you. For this reason, values are not considered an endpoint. Hence, the key is to focus more on completing activities important to you than on whether you have succeeded at accomplishing the values.

Activity selection and ranking (Form 2). By now, you will have identified many activities for each of the values in your life areas. We will pick 15 activities to use as a starting point. As you select an activity, add it to the left column of Form 2 (Activity Selection and Ranking). Remember that the activities should be observable, measurable, in their smallest pieces, and directly relevant to what you listed as being most important to you in the Life Areas, and Activities Inventory (Form 1). The more your daily activities are linked to what you care the most about, the more likely you will experience the activities as meaningful and the more you will feel that you are living the life you want to live. Once you have your 15 activities listed on Form 2, rank them from 1 (*easiest to accomplish*) to 15 (*hardest to accomplish*) on the right column of Form 3. One way to do this is to first identify the easiest and assign it a 1, and then identify the most difficult and assign it a 15. From there, try to fill in the others. In activity planning, you will start with the easiest activities and gradually work towards the more difficult ones.

Daily monitoring with activity planning (Form 3). Once you have identified the 15 target activities, you will need a plan for how you will include these activities in your daily schedule and how you will monitor your progress. We will use Daily Monitoring Forms for the upcoming weeks to help you plan your new activities. Your opinion will be critical in deciding how many activities to select and it is important that you challenge yourself without becoming

overwhelmed. The simplest approach is usually to start with 1-3 of the easiest activities. We will begin now by identifying activities for the coming week and entering these activities into the blank Daily Monitoring Forms for the days that you plan to do them. For example, if your activity is “play with your daughter” you might enter that activity (Form 3) on Monday, Wednesday, and Thursday.

Be sure to seriously consider whether you are ready for a particular activity and consider barriers that you might encounter. If you are not ready, you may wait for another week to do it. If there are barriers to doing the activity, we should discuss steps you might take to first overcome those barriers. It is important to break activities down into the smallest pieces possible. When you run into difficulty with an activity it can be useful to consider if you really have broken the activity down far enough. For example, if your activity is to go to the gym twice a week, you first might have to buy clothing, research gyms, find a partner to go to the gym with, or arrange for transportation. In this case, “going to the gym” may not be the smallest piece of this activity.

During the upcoming week, you will complete the Daily Monitoring Form by circling the planned activities that were completed. Strike out the activities that were not completed on the scheduled day and try to re-plan the missed activity for another time that week. We will review your Daily Monitoring Form next week and address whatever challenges arise if you have problems accomplishing any of the activities you planned.

Homework:

Complete Daily Monitoring Form and activities listed on it.

Session Three - Seven

Session Key Elements:

1. Collect measures
 - BDI-II
 - ORS
 - Treatment phase weekly tracking questionnaire
2. Review homework
 - Discuss challenges to completing the planned activities
3. Plan and assign new homework

Collect measures - (1) BDI-II, (2) ORS, and (3) Treatment phase weekly tracking questionnaire. Before we start the session, we will need to complete this set of questionnaires

Review of homework. Let's review your Daily Monitoring Form for the week.

Discussion on the completion of activities. How many of the planned activities did you accomplish? For those that you accomplished, how easy or difficult were they? How did you feel about having accomplished those activities? Are you finding that you feel better when you are more active? If so, this is good progress. Would you like to continue those activities or select different ones for next week?

Discussion to have if there are activities that are not completed. Were there activities that you planned that you did not accomplish? If so, what stood in the way of you completing the activities? Was it because you really do not find the activity to be important? If this is true, then one option is to select a different activity instead. If it is an activity that you want to keep trying to do, then there are a few other issues to consider. Was the activity more difficult to accomplish than what you originally had expected? If so, we can discuss breaking it into smaller

steps as we have discussed previously. Alternatively, you might have felt you just ran out of time and couldn't complete this activity. We can revisit your monitoring forms and think about ways to fit new activities into your schedule. You might also have to seriously consider strategies for reducing your time spent in less valued current activities to make more time for these new more valued activities. This may include the difficult task of setting stricter boundaries around your time. In this case, we can discuss how to plan some activities to help set those boundaries and reclaim some time for yourself. Although these types of changes in your daily routine may be difficult, the planning and monitoring in this program can help reduce currently less valued activities and to get you doing more important new activities.

Plan and assign new homework. Based on our discussion this session, you should now plan your activities for the next week. Dealing with depression is a process, and as you begin to feel better, your plans for yourself may change. You might find it easier to be more active and set increasingly difficult activity goals. On the other hand, you might feel that your original plan was too difficult and have new ideas on how to reduce the difficulty of your activities. Do not feel stuck with your original plan, because it is always open to change. The important thing is that you are increasing your activity level and as you do this, your depression is improving. It is impossible to live an active and fulfilling life and be depressed at the same time. The idea is to increase the amount of time you spend in important activities so that this is what your life is about instead of your life being about depression. If you are able, try to plan for one or more new activities for the upcoming week in addition to the activities you accomplished the previous week.

Homework:

Complete Daily Monitoring Form and activities listed on it.

Session Eight

Session Eight Key Elements:

1. Collect measures
 - BDI-II
 - ORS
 - Treatment phase weekly tracking questionnaire
2. Review homework
3. Preparing for the End of Study

Collect measures - (1) BDI-II, (2) ORS, and (3) Treatment phase weekly tracking questionnaire. Please complete this set of questionnaires.

Review homework. Let's review your Daily Monitoring form for each day last week. Are you finding that you feel better when you are more active? If so, this is good progress. If not, make sure that your activities are important to you. Sometimes people will increase their activities, but find that the activities they selected do not feel as important as they first assumed.

Are you finding it is difficult to accomplish the activities you planned? If so, you might consider breaking those activities into smaller steps. Think about small steps that can be accomplished that move you closer to the larger, more difficult activity.

Preparing for the end of the study. We have done a lot of work together throughout this program and you have accomplished so much. At this point, you have learned a number of skills that can help you feel better and live healthier when you begin to feel depressed again. Should depressed feelings return it will be helpful to practice all of the skills again, and you might consider continuing to do the skills and monitoring as a part of your life regardless of how you feel!

Finally, it is important to remember that depression cannot exist when you live a life engaged in important activities. No matter what has happened to us in the past, it is possible for every one of us to make changes to our lives, to make the best of our circumstances, and spend our time doing activities that give us as much purpose and meaning as possible. Please be reminded that you will be contacted again one week and two months after today to complete another set of questionnaires and interviews.

List of Forms

Form 1. Life Areas and Activities Inventory

Form 2. Activity Selection and Ranking Form

Form 3. Daily Monitoring Form

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Form 1

Life Areas and Activities Inventory

Instructions:

1. Identify what is most important to you within each of the life areas (e.g., taking care of your health).
2. Identify activities that you can engage in that are related to what is most important to you. (e.g., exercising daily).

Life Area (1/10): Family relationships

| |
|--------------------------|
| What's Important: |
| • Activity 1: |
| • Activity 2: |
| • Activity 3: |
| • Activity 4: |
| • Activity 5: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Life Area (2/10): Life Area: Marriage/couples/intimate relationships

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

Life Area (3/10): Life Area: Parenting

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

| |
|---|
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

Life Area (4/10): Life Area: Friendships/social relationships

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

| |
|---|
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

Life Area (5/10): Life Area: Employment

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Life Area (6/10): Life Area: Education/training

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

Life Area (7/10): Life Area: Recreation

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

| |
|---|
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

Life Area (8/10): Life Area: Spirituality

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

| |
|---|
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

Life Area (9/10): Life Area: Citizenship/Community Life

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Life Area (10/10): Life Area: Physical well-being

| |
|---|
| What's Important: |
| <ul style="list-style-type: none">• Activity 1: |
| <ul style="list-style-type: none">• Activity 2: |
| <ul style="list-style-type: none">• Activity 3: |
| <ul style="list-style-type: none">• Activity 4: |
| <ul style="list-style-type: none">• Activity 5: |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Form 2

Activity Selection and Ranking Form (Value-based Protocol)

Instructions:

1. List 15 activities from the PAL that you identified as enjoyable.
2. Rate the difficulty of each activity from 1 = least difficult to accomplish to 15 = most difficult to accomplish.

| ACTIVITY | RANK |
|----------|------|
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COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Form 3

Daily Monitoring Form (Value-based Protocol)

Instructions:

1. Circle each planned activity that you completed as part of your homework.
2. If you did not complete the activity, try to re-plan the missed activity for another day in the week.

| Day/date | Activities |
|----------|------------|
| | |
| | |
| | |
| | |
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| | |
| | |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

APPENDIX R

Debriefing Statement

Comparing Behavioral Activation Protocols

Thank you for participating in this study. It is our hope that your participation will be beneficial in helping you to better cope with your depressive symptoms and more broadly, increase our understanding of more efficacious treatment approaches in helping others like yourself better cope with depression. We hope to ultimately use this knowledge to help improve the quality of life for those who struggle with clinical depression. It is our intent to have a number of others, such as yourself, participate in this project before it is completed. For this reason, we ask that you not discuss details of the project with your classmates, other students, or colleagues who may also be potential participants in this study.

If you have any questions about the study, you are welcome to contact the researchers using the contact information at the bottom of this page. Because the project is currently ongoing, we are unfortunately unable to summarize the ultimate findings at this point in time. Once the project has been completed, we will be happy to share the results with you. If you are interested, provide us with your contact information. Meanwhile, you may direct any questions or comments that you might have about this project to the primary or secondary investigator listed below. Thank you again for your participation. If you wish, please print and keep this statement.

Primary Investigator

Robert D. Zettle
440 Jabara Hall
(316)-978-3081
Robert.zettle@wichita.edu

Secondary Investigator

Jia Hui Chaw
439 Jabara Hall
(316)-978-6347
jxchaw@shockers.wichita.edu

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 1

Demographic and Background Information of Participants

| Protocol | Participant | Source of Recruitment | Gender | Age | Race | Current Medication | Duration of Pharmacotherapy |
|-----------------|-------------|-----------------------|--------|-----|-------|--------------------|-----------------------------|
| Mood-based | | | | | | | |
| 3-week baseline | P03 | Human subject pool | F | 31 | White | SSRI | 11 months |
| | P09 | Human subject pool | F | 21 | White | None | N/A |
| 4-week baseline | P08 | Human subject pool | F | 46 | White | SSRI | >15 years |
| | P10 | Human subject pool | F | 21 | Asian | None | N/A |
| 5-week baseline | P04 | Human subject pool | F | 34 | White | SSRI | 7 months |
| | P12 | Community | F | 30 | White | SSRI | 4 years |
| Value-based | | | | | | | |
| 3-week baseline | P01 | Human subject pool | M | 19 | White | None | N/A |
| | P05 | Human subject pool | F | 27 | White | None | N/A |
| | P14 | Community | F | 34 | White | Benzodiazepine | 6 years |
| 4-week baseline | P07 | Human subject pool | F | 19 | White | None | N/A |
| | P11 | Community | F | 24 | White | None | N/A |
| | P13 | Human subject pool | F | 40 | White | None | N/A |
| 5-week baseline | P02 | Human subject pool | F | 22 | White | SSRI | >2 years |
| | P06 | Human subject pool | F | 20 | White | SSRI | 7 months |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 2

List of Measures

Pretreatment Screening Measures

Background Information Questionnaire: Demographic information and historical information

Beck Depression Inventory-II (BDI-II): Diagnostic verification

Hamilton Rating Scale for Depression (HRS-D): Diagnostic verification and severity of depression

Macrolevel Outcome Measures: Administered at pretreatment, posttreatment, and 2-month follow-up.

Beck Depression Inventory-II (BDI-II)

Hamilton Rating Scale for Depression (HRS-D)

Beck Anxiety Inventory (BAI): Symptoms of anxiety

Outcome Rating Scale (ORS): Quality of life

Microlevel Outcome Measures: Administered weekly during baseline and at each treatment session

Outcome Rating Scale (ORS)

Beck Depression Inventory-II (BDI-II)

Macrolevel Process Measures: Administered at pretreatment, posttreatment, and 2-month follow-up.

Valued Living Questionnaire (VLQ): Valued living

Pleasant Activities List (PAL): Frequency and subjective enjoyability of pleasurable activities

Microlevel Process Measures: Administered weekly during baseline and at each treatment session.

Weekly Tracking Questionnaire: Overall activity level, mood, and valued-living

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 3

HRS-D Scores for Initial Interviewers and Reliability Checkers

| | Interviewer | Reliability Checker |
|---------------|-------------|---------------------|
| Pretreatment | | |
| P01 | B - 24 | C - 18 |
| P02 | A - 18 | N/A |
| P03 | B - 20 | C - 15 |
| P04 | B - 15 | C - 13 |
| P05 | A - 19 | B - 22 |
| P06 | B - 17 | C - 15 |
| P07 | A - 14 | N/A |
| P08 | A - 20 | B - 21 |
| P09 | B - 14 | C - 9 |
| P10 | A - 12 | N/A |
| P11 | A - 19 | N/A |
| P12 | B - 24 | C - 16 |
| P13 | B - 19 | C - 19 |
| P14 | A - 18 | B - 20 |
| Posttreatment | | |
| P01 | B - 14 | C - 15 |
| P02 | A - 17 | B - 15 |
| P03 | B - 8 | C - 7 |
| P04 | B - 3 | C - 2 |
| P05 | A - 13 | N/A |
| P06 | B - 8 | C - 7 |
| P07 | A - 7 | B - 7 |
| P08 | A - 20 | N/A |
| P09 | C - 5 | B - 4 |
| P10 | A - 22 | N/A |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

| | Interviewer | Reliability Checker |
|---------------|-------------|---------------------|
| Posttreatment | | |
| P11 | A - 2 | N/A |
| P12 | C - 12 | B - 12 |
| P13 | C - 2 | B - 2 |
| P14 | A - 6 | N/A |
| Follow-up | | |
| P01 | C - 19 | B - 16 |
| P02 | A - 14 | N/A |
| P03 | C - 12 | B - 7 |
| P04 | C - 9 | B - 5 |
| P05 | A - 9 | N/A |
| P06 | C - 7 | B - 5 |
| P07 | A - 10 | N/A |
| P08 | A - 9 | N/A |
| P09 | C - 7 | B - 6 |
| P10 | A - 3 | B - 3 |
| P11 | A - 6 | B - 6 |
| P12 | C - 18 | B - 16 |
| P13 | C - 2 | B - 4 |
| P14 | A - 14 | N/A |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 4

Data for Macrolevel Outcome Measures at Pretreatment, Posttreatment, and 2-Month Follow-up

| | | <u>Mood-based Participants</u> | | | | | | | | |
|---------------------|------|---------------------------------|-------|-------|-------|-------|-------|---------------|-------|---------------|
| | | P03 | P04 | P08 | P09 | P10 | P12 | Mean (SD) | | |
| BDI-II ^a | | | | | | | | | | |
| | Pre | 33.33 | 39.00 | 22.00 | 22.67 | 29.00 | 28.80 | 29.13 (6.45) | | |
| | Post | 10.00 | 23.00 | 41.00 | 1.00 | 1.00 | 7.00 | 13.83 (15.57) | | |
| | FU | 5.00 | 12.00 | 9.00 | 16.00 | 5.00 | 17.00 | 10.67 (5.24) | | |
| HRS-D | | | | | | | | | | |
| | Pre | 17.50 | 14.00 | 20.00 | 11.50 | 22.00 | 20.00 | 17.50 (4.02) | | |
| | Post | 7.50 | 2.50 | 20.00 | 4.50 | 2.00 | 12.00 | 8.08 (6.91) | | |
| | FU | 9.50 | 7.00 | 9.00 | 6.50 | 3.00 | 17.00 | 8.67 (4.69) | | |
| BAI | | | | | | | | | | |
| | Pre | 27.00 | 27.00 | 46.00 | 6.00 | 30.00 | 9.00 | 24.17 (14.74) | | |
| | Post | 0.00 | 10.00 | 36.00 | 0.00 | 1.00 | 20.00 | 11.17 (14.48) | | |
| | FU | 6.00 | 12.00 | 24.00 | 3.00 | 4.00 | 16.00 | 10.83 (8.16) | | |
| ORS ^a | | | | | | | | | | |
| | Pre | 16.93 | 11.06 | 14.53 | 18.37 | 11.60 | 15.40 | 14.65 (2.89) | | |
| | Post | 34.00 | 21.80 | 6.10 | 33.60 | 26.30 | 32.20 | 25.67 (10.71) | | |
| | FU | 31.90 | 17.50 | 28.60 | 28.70 | 26.20 | 21.30 | 25.70 (5.34) | | |
| | | <u>Value-based Participants</u> | | | | | | | | |
| | | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 | Mean (SD) |
| BDI-II | | | | | | | | | | |
| | Pre | 34.00 | 26.80 | 32.67 | 22.40 | 22.25 | 33.25 | 24.50 | 23.67 | 27.44 (5.07) |
| | Post | 28.00 | 22.00 | 12.00 | 15.00 | 15.00 | 10.00 | 11.00 | 11.00 | 15.50 (6.35) |
| | FU | 38.00 | 14.00 | 15.00 | 9.00 | 12.00 | 4.00 | 2.00 | 29.00 | 15.38 (12.30) |
| HRS-D | | | | | | | | | | |
| | Pre | 21.00 | 18.00 | 19.00 | 16.00 | 14.00 | 19.00 | 19.00 | 18.00 | 18.00 (2.14) |
| | Post | 14.50 | 17.00 | 13.00 | 7.50 | 7.00 | 2.00 | 2.00 | 6.00 | 8.63 (5.64) |
| | FU | 16.00 | 14.00 | 9.00 | 6.00 | 10.00 | 6.00 | 3.00 | 14.00 | 9.75 (4.62) |
| BAI | | | | | | | | | | |
| | Pre | 49.50 | 30.00 | 25.00 | 39.00 | 14.00 | 16.00 | 20.00 | 16.00 | 26.19 (12.64) |
| | Post | 33.00 | 9.00 | 24.00 | 37.00 | 9.00 | 11.00 | 12.00 | 12.00 | 18.38 (11.36) |
| | FU | 22.00 | 18.00 | 8.00 | 11.00 | 10.00 | 4.00 | 1.00 | 27.00 | 12.63 (8.98) |
| ORS | | | | | | | | | | |
| | Pre | 7.63 | 21.60 | 15.90 | 20.60 | 19.60 | 12.80 | 18.45 | 23.63 | 17.53 (5.23) |
| | Post | 6.70 | 21.40 | 16.60 | 29.00 | 28.50 | 35.60 | 33.70 | 28.10 | 24.95 (9.59) |
| | FU | 10.80 | 30.80 | 22.60 | 31.20 | 23.50 | 38.60 | 34.30 | 21.60 | 26.68 (8.80) |

^a Represents the mean of weekly baseline administrations of measure.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 5

Data for Macrolevel Process Measures at Pretreatment, Posttreatment, and 2-Month Follow-up

| | | <u>Mood-based Participants</u> | | | | | | | | |
|-----------------------|------|---------------------------------|-------|-------|-------|-------|-------|---------------|-------|---------------|
| | | P03 | P04 | P08 | P09 | P10 | P12 | Mean (SD) | | |
| VLQ | | | | | | | | | | |
| | Pre | 32.60 | 37.70 | 43.90 | 56.10 | 39.10 | 18.80 | 38.03 (12.34) | | |
| | Post | 17.40 | 41.50 | 37.60 | 53.70 | 51.30 | 33.90 | 39.23 (13.17) | | |
| | FU | 14.90 | 47.50 | 54.30 | 47.90 | 54.60 | 37.10 | 42.72 (15.04) | | |
| PAL frequency | | | | | | | | | | |
| | Pre | 1.87 | 1.63 | 1.79 | 1.59 | 1.79 | 1.53 | 1.70 (0.13) | | |
| | Post | 1.47 | 1.63 | 1.79 | 1.46 | 1.58 | 1.77 | 1.62 (0.14) | | |
| | FU | 1.90 | 1.78 | 2.26 | 1.32 | 1.91 | 1.88 | 1.84 (0.30) | | |
| PAL obtained pleasure | | | | | | | | | | |
| | Pre | 5.06 | 4.01 | 4.72 | 4.86 | 6.75 | 3.95 | 4.89 (1.02) | | |
| | Post | 4.47 | 4.50 | 5.20 | 4.48 | 6.62 | 5.58 | 5.14 (0.86) | | |
| | FU | 5.40 | 5.40 | 7.50 | 4.14 | 7.57 | 5.76 | 5.96 (1.34) | | |
| | | <u>Value-based Participants</u> | | | | | | | | |
| | | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 | Mean (SD) |
| VLQ | | | | | | | | | | |
| | Pre | 25.90 | 47.90 | 34.90 | 55.30 | 30.30 | 20.40 | 34.30 | 30.30 | 34.91 (11.46) |
| | Post | 32.90 | 47.90 | 40.60 | 58.60 | 33.60 | 41.40 | 54.40 | 47.40 | 44.60 (13.17) |
| | FU | 29.10 | 37.20 | 24.60 | 71.70 | 26.80 | 58.10 | 45.00 | 47.10 | 42.45 (15.04) |
| PAL frequency | | | | | | | | | | |
| | Pre | 1.63 | 2.01 | 1.73 | 2.29 | 1.81 | 1.40 | 1.44 | 1.81 | 1.77 (0.29) |
| | Post | 1.56 | 2.02 | 1.40 | 1.99 | 2.12 | 1.68 | 1.81 | 1.63 | 1.78 (0.25) |
| | FU | 1.73 | 2.35 | 1.39 | 1.90 | 1.96 | 1.88 | 1.70 | 1.73 | 1.83 (0.27) |
| PAL obtained pleasure | | | | | | | | | | |
| | Pre | 3.40 | 7.55 | 4.73 | 7.29 | 5.89 | 3.50 | 2.77 | 5.65 | 5.10 (1.80) |
| | Post | 3.42 | 8.39 | 2.99 | 6.14 | 7.53 | 5.19 | 5.40 | 3.75 | 5.35 (1.95) |
| | FU | 3.99 | 10.42 | 2.87 | 6.18 | 6.68 | 5.78 | 4.75 | 4.37 | 5.63 (2.30) |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 6

Data for Microlevel Process Measures at Pretreatment

| <u>Mood-based Participants</u> | | | | | | | | | |
|---------------------------------|------|------|------|------|------|------|-------------|------|-------------|
| | P03 | P04 | P08 | P09 | P10 | P12 | Mean (SD) | | |
| Mood ^a | 5.33 | 3.40 | 3.25 | 5.67 | 3.00 | 4.80 | 4.24 (1.16) | | |
| Overall ^b | 5.00 | 5.40 | 3.50 | 5.00 | 5.25 | 4.40 | 4.76 (0.70) | | |
| activity level | | | | | | | | | |
| Enjoyment ^c | 4.00 | 3.00 | 3.50 | 5.00 | 2.50 | 4.67 | 3.78 (0.96) | | |
| Valued | 3.67 | 3.40 | 4.25 | 5.00 | 7.25 | 4.80 | 4.73 (1.38) | | |
| living ^d | | | | | | | | | |
| <u>Value-based Participants</u> | | | | | | | | | |
| | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 | Mean (SD) |
| Mood ^a | 2.67 | 5.20 | 3.33 | 6.20 | 6.50 | 4.00 | 4.75 | 6.00 | 4.83 (1.40) |
| Overall ^b | 5.00 | 5.20 | 4.00 | 7.20 | 4.75 | 4.25 | 4.25 | 5.00 | 4.96 (1.00) |
| activity level | | | | | | | | | |
| Enjoyment ^c | 2.67 | 6.00 | 4.33 | 6.33 | 6.00 | 4.00 | 3.75 | 5.67 | 4.84 (1.33) |
| Valued | 2.33 | 6.40 | 4.00 | 7.80 | 5.75 | 5.75 | 3.25 | 4.67 | 4.99 (1.78) |
| living ^d | | | | | | | | | |

Note. a-d are questions from the Baseline Phase Weekly Tracking Questionnaire with data representing the mean of weekly baseline administrations. ^a Mood = “How would you rate your overall mood in this past week? (1 = *very unpleasant*; 10 = *very pleasant*)”. ^b Overall activity level = “How would you rate your activity level compared to last week? (1 = *much lower*; 10 = *much higher*)”. ^c Enjoyment = “In the last week, how much did you enjoy the activities that you engaged in? (1 = *not at all*; 10 = *extremely*)”. ^d Valued living = “In the last week, how important was it to you to engage in the activities? (1 = *not at all important*; 10 = *extremely important*)”.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 7

Clinical Status of Participants at Posttreatment and Follow-up

| | <u>Recovery</u> | | Pre to Post | <u>Improvement</u> | |
|-----------------------------|-------------------------|--------------------|------------------------------|--------------------|------------------------------|
| | Posttreatment | Follow-up | | Post to FU | Pre to FU |
| Mood-based (<i>n</i> = 6) | | | | | |
| BDI-II | P03, P09, P10, P12 | P03, P04, P08, P10 | P03, P04, P08, P09, P10, P12 | P04, P08, P09, P12 | P03, P04, P08, P10, P12 |
| HRS-D | P04, P09, P10 | P10 | P03, P04, P10, P12 | P08 | P03, P08, P10 |
| BAI | P03, P09, P10 | P03, P09, P10 | P03, P04, P10 | - | P03, P08, P10 |
| ORS | P03, P09, P10, P12 | P03, P08, P09, P10 | P03, P04, P09, P10, P12 | P08, P12 | P03, P04, P08, P09, P10, P12 |
| Value-based (<i>n</i> = 8) | | | | | |
| BDI-II | P05, P11, P13, P14 | P06, P07, P11, P13 | P05, P11, P13, P14 | <i>P01, P14</i> | P02, P05, P06, P07, P11, P13 |
| HRS-D | P11, P13, P14 | P06, P11, P13 | P06, P11, P13, P14 | <i>P14</i> | P05, P06, P11, P13 |
| BAI | - | P11, P13 | P01, P02 | P05, P06 | P01, P05, P06, P13 |
| ORS | P06, P07, P11, P13, P14 | P02, P06, P11, P13 | P06, P07, P11, P13 | P02, P05, P07, P14 | P02, P05, P06, P11, P13 |

Note. Italicized entries denote participants who deteriorated during the time period indicated.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 8

Summary of PND and SMA and Analyses of Microlevel BDI-II Data

| | <u>Mood-based Participants</u> | | | | | | | |
|---------------------------|---------------------------------|--------------|----------------|---------------|---------------|---------------|---------------|---------------|
| | P03 | P04 | P08 | P09 | P10 | P12 | | |
| <u>Means</u> | | | | | | | | |
| Baseline | 33.33 | 39.00 | 22.00 | 22.67 | 29.00 | 28.80 | | |
| Treatment | 11.86 | 32.57 | 22.00 | 11.43 | 13.57 | 14.43 | | |
| PND ^a | 100.00% | 0.00% | 14.29% | <i>71.43%</i> | <i>85.71%</i> | <i>71.43%</i> | | |
| <i>p</i> | 0.005* | 1.000 | 0.505 | 0.062 | 0.010** | 0.019** | | |
| SMA <i>r</i> ^b | -0.93 | <i>-0.43</i> | 00.00 | -0.59 | -0.74 | -0.70 | | |
| <i>p</i> | 0.002** | 0.211 | 1.000 | 0.103 | 0.168 | 0.096 | | |
| | <u>Value-based Participants</u> | | | | | | | |
| | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 |
| <u>Means</u> | | | | | | | | |
| Baseline | 34.00 | 26.80 | 32.67 | 22.40 | 22.25 | 33.25 | 24.50 | 23.67 |
| Treatment | 34.29 | 22.71 | 15.29 | 16.43 | 18.71 | 23.71 | 15.86 | 15.00 |
| PND | 14.29% | 42.86% | 100.00% | <i>85.71%</i> | <i>85.71%</i> | <i>71.43%</i> | <i>71.43%</i> | <i>71.43%</i> |
| <i>p</i> | 0.576 | 0.121 | 0.005** | 0.005** | 0.01** | 0.033* | 0.033* | 0.062 |
| SMA <i>r</i> | 0.06 | <i>-0.35</i> | -0.91 | -0.60 | -0.83 | -0.58 | -0.65 | -0.64 |
| <i>p</i> | 0.853 | 0.336 | 0.005** | 0.280 | 0.041* | 0.151 | 0.061 | 0.220 |

Note. Entries in italics denote “effective” or medium effect sizes; entries in bold “very effective” or large effect sizes. ^aPND = Percentage of nonoverlapping data ^b*r.*= Pearson’s correlation between BDI-II and the phase (i.e., treatment effect size).

* $p \leq .05$. ** $p \leq .01$.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 9

Summary of PND and SMA and Analyses of Microlevel ORS Data

| | <u>Mood-based Participants</u> | | | | | | | |
|---------------------------|---------------------------------|----------------|----------------|-------------|-------------|-------------|----------------|-------------|
| | P03 | P04 | P08 | P09 | P10 | P12 | | |
| Means | | | | | | | | |
| Baseline | 16.93 | 11.06 | 14.53 | 18.37 | 11.60 | 15.40 | | |
| Treatment | 32.43 | 17.36 | 19.31 | 24.70 | 23.07 | 26.97 | | |
| PND ^a | 100.00% | 100.00% | 100.00% | 57.14% | 85.71% | 85.71% | | |
| <i>p</i> | 0.005** | 0.001** | 0.002** | 0.130 | 0.010** | 0.005** | | |
| SMA <i>r</i> ^b | 0.91 | 0.78 | 0.58 | <i>0.48</i> | 0.74 | 0.69 | | |
| <i>p</i> | 0.009** | 0.035* | 0.122 | 0.160 | 0.120 | 0.207 | | |
| | <u>Value-based Participants</u> | | | | | | | |
| | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 |
| Means | | | | | | | | |
| Baseline | 7.63 | 21.60 | 15.90 | 20.60 | 19.60 | 12.80 | 18.45 | 23.63 |
| Treatment | 7.03 | 21.26 | 16.87 | 27.64 | 24.16 | 26.41 | 26.99 | 27.31 |
| PND | 14.29% | 57.14% | 14.29% | 85.71% | 71.43% | 85.71% | 100.00% | 57.14% |
| <i>p</i> | 0.576 | 0.052 | 0.576 | 0.005** | 0.033* | 0.010* | 0.002** | 0.130 |
| SMA <i>r</i> | -0.19 | -0.02 | 0.02 | 0.56 | 0.62 | 0.71 | 0.70 | <i>0.44</i> |
| <i>p</i> | 0.520 | 0.968 | 0.536 | 0.244 | 0.140 | 0.170 | 0.074 | 0.379 |

Note. Entries in italics denote “effective” or medium effect sizes; entries in bold “very effective” or large effect sizes. ^aPND = Percentage of nonoverlapping data. ^b *r* = Pearson’s correlation between ORS and the phase (i.e., treatment effect size).

* $p \leq .05$. ** $p \leq .01$.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 10

Summary of PND and SMA and Analyses of Microlevel Overall Mood Data

| | | <u>Mood-based Participants</u> | | | | | | | |
|---------------------------|--|---------------------------------|-------------|--------|--------|----------------|-------------|-------------|--------|
| | | P03 | P04 | P08 | P09 | P10 | P12 | | |
| Means | | | | | | | | | |
| Baseline | | 5.33 | 3.40 | 3.25 | 5.67 | 3.00 | 4.80 | | |
| Treatment | | 7.29 | 5.71 | 4.00 | 6.71 | 7.43 | 7.00 | | |
| PND ^a | | 57.14% | 71.43% | 28.57% | 71.43% | 100.00% | 71.43% | | |
| <i>p</i> | | 0.130 | 0.019* | 0.306 | 0.062 | 0.002** | 0.019* | | |
| SMA <i>r</i> ^b | | 0.58 | 0.77 | 0.48 | 0.21 | 0.87 | 0.60 | | |
| <i>p</i> | | 0.173 | 0.038* | 0.217 | 0.548 | 0.027* | 0.249 | | |
| | | <u>Value-based Participants</u> | | | | | | | |
| | | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 |
| Means | | | | | | | | | |
| Baseline | | 2.67 | 5.20 | 3.33 | 6.20 | 6.50 | 4.00 | 4.75 | 6.00 |
| Treatment | | 3.29 | 6.14 | 4.71 | 7.14 | 6.29 | 6.71 | 6.86 | 6.86 |
| PND | | 28.57% | 0.00% | 0.00% | 14.29% | 0.00% | 42.86% | 71.43% | 71.43% |
| <i>p</i> | | 0.386 | 1.000 | 1.000 | 0.450 | 1.000 | 0.166 | 0.033* | 0.062 |
| SMA <i>r</i> | | 0.30 | 0.25 | 0.43 | 0.28 | -0.08 | 0.50 | 0.70 | 0.33 |
| <i>p</i> | | 0.609 | 0.451 | 0.290 | 0.449 | 0.767 | 0.200 | 0.115 | 0.565 |

Note. Entries in italics denote “effective” or medium effect sizes; entries in bold “very effective” or large effect sizes. ^aPND = Percentage of nonoverlapping data. ^b*r* = Pearson’s correlation between overall mood and the phase (i.e., treatment effect size).

* *p* ≤ .05. ** *p* ≤ .01.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 11

Summary of PND and Analyses of Microlevel Activity Level Data

| | <u>Mood-based Participants</u> | | | | | | | |
|------------------|---------------------------------|----------------|-------|---------------|----------------|---------------|--------|---------------|
| | P03 | P04 | P08 | P09 | P10 | P12 | | |
| PND ^a | 28.57% | 100.00% | 0.00% | <i>71.43%</i> | 100.00% | 57.14% | | |
| <i>p</i> | 0.386 | 0.001** | 1.000 | 0.062 | 0.002** | 0.052 | | |
| | <u>Value-based Participants</u> | | | | | | | |
| | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 |
| PND | 100.00% | 57.14% | 0.00% | <i>85.71%</i> | <i>85.71%</i> | <i>85.71%</i> | 57.14% | <i>71.43%</i> |
| <i>p</i> | 0.005** | 0.052 | 1.000 | 0.005** | 0.010** | 0.010** | 0.080 | 0.0062 |

Note. Entries in italics denote “effective” effect sizes; entries in bold “very effective” effect sizes. ^aPND = Percentage of nonoverlapping data.

* $p \leq .05$. ** $p \leq .01$.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 12

Summary of PND and SMA and Analyses of Microlevel Enjoyment Data

| | | <u>Mood-based Participants</u> | | | | | | | |
|---------------------------|--|---------------------------------|------------------|------------------|--------------|------------------|------------------|------------------|--------------|
| | | P03 | P04 | P08 | P09 | P10 | P12 | | |
| Means | | | | | | | | | |
| Baseline | | 4.50 | 3.33 | 4.25 | 6.00 | 2.60 | 4.83 | | |
| Homework | | 8.17 | 8.83 | 6.17 | 7.17 | 9.50 | 7.00 | | |
| Nonhomework | | 7.00 | 7.83 | 5.83 | 7.67 | 7.67 | 7.83 | | |
| Homework | | | | | | | | | |
| PND ^a | | 100.00%** | 100.00%** | 100.00%** | 16.67% | 100.00%** | 66.67%* | | |
| <i>p</i> | | 0.003 | 0.001 | 0.001 | 0.464 | 0.001 | 0.021 | | |
| SMA <i>r</i> ^b | | 0.875* | 0.958** | 0.840* | 0.280 | 0.982** | 0.784* | | |
| <i>p</i> | | 0.018 | 0.000 | 0.0384 | 0.507 | 0.000 | 0.040 | | |
| Nonhomework | | | | | | | | | |
| PND ^a | | 66.67% | 100.00%** | 83.33%** | 16.67% | 100.00%** | 83.33%** | | |
| <i>p</i> | | 0.052 | 0.001 | 0.009 | 0.464 | 0.001 | 0.005 | | |
| SMA <i>r</i> ^b | | 0.760 | 0.913** | 0.812 | <i>0.390</i> | 0.932** | 0.815 | | |
| <i>p</i> | | 0.086 | 0.009 | 0.083 | 0.328 | 0.005 | 0.086 | | |
| | | <u>Value-based Participants</u> | | | | | | | |
| | | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 |
| Means | | | | | | | | | |
| Baseline | | 2.50 | 6.00 | 4.75 | 7.00 | 5.60 | 3.80 | 4.00 | 5.25 |
| Homework | | 6.83 | 7.33 | 6.17 | 7.67 | 7.50 | 8.00 | 7.33 | 7.33 |
| Nonhomework | | 3.67 | 7.33 | 4.50 | 8.33 | 6.50 | 8.17 | 6.50 | 7.67 |
| Homework | | | | | | | | | |
| PND ^a | | 100.00%** | 66.67%* | 50.00% | 0.00% | 0.00% | 66.67%* | 100.00%** | 66.67% |
| <i>p</i> | | 0.003 | 0.021 | 0.125 | 1.000 | 1.000 | 0.032 | 0.001 | 0.052 |
| SMA <i>r</i> ^b | | 0.941** | <i>0.431</i> | 0.623 | 0.283 | 0.633* | 0.771* | 0.853* | 0.750 |
| <i>p</i> | | 0.002 | 0.138 | 0.264 | 0.403 | 0.022 | 0.040 | 0.022 | 0.100 |
| Nonhomework | | | | | | | | | |
| PND ^a | | 66.67% | 50.00% | 16.67% | 0.00% | 0.00% | 100.00%** | 83.33%** | 83.33%* |
| <i>p</i> | | 0.052 | 0.066 | 0.464 | 1.000 | 1.000 | 0.001 | 0.009 | 0.016 |
| SMA <i>r</i> ^b | | 0.583* | <i>0.381</i> | 0.073 | 0.535 | <i>0.311</i> | 0.864* | 0.773* | 0.763 |
| <i>p</i> | | 0.049 | 0.180 | 0.898 | 0.196 | 0.240 | 0.017 | 0.042 | 0.075 |

Note. Entries in italics denote “effective” or medium effect sizes; entries in bold “very effective” or large effect sizes. ^aPND = Percentage of nonoverlapping data. ^b*r* = Pearson’s correlation between overall mood and the phase (i.e., treatment effect size).

* *p* ≤ .05. ** *p* ≤ .01.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 13

Summary of PND and SMA and Analyses of Microlevel Importance Data

| <u>Mood-based Participants</u> | | | | | | | | |
|---------------------------------|------------------|------------------|---------------|--------------|------------------|------------------|------------------|------------------|
| | P03 | P04 | P08 | P09 | P10 | P12 | | |
| Means | | | | | | | | |
| Baseline | 4.00 | 3.50 | 4.20 | 5.75 | 7.40 | 4.83 | | |
| Homework | 8.33 | 8.67 | 6.17 | 5.83 | 10.00 | 6.83 | | |
| Nonhomework | 7.33 | 7.83 | 5.83 | 8.00 | 9.67 | 7.67 | | |
| Homework | | | | | | | | |
| PND ^a | 100.00%** | 100.00%** | 0.00% | 33.33% | 100.00%** | 100.00%** | | |
| <i>p</i> | 0.003 | 0.001 | 1.000 | 0.260 | 0.001 | 0.001 | | |
| SMA <i>r</i> ^b | 0.878* | 0.919** | 0.660* | 0.015 | 0.923** | 0.875* | | |
| <i>p</i> | 0.012 | 0.005 | 0.033 | 0.967 | 0.006 | 0.015 | | |
| Nonhomework | | | | | | | | |
| PND ^a | 100.00%** | 83.33%** | 0.00% | 66.67% | 83.33%** | 100.00%** | | |
| <i>p</i> | 0.003 | 0.005 | 1.000 | 0.052 | 0.009 | 0.001 | | |
| SMA <i>r</i> ^b | 0.861* | 0.880* | 0.590 | <i>0.447</i> | 0.826* | 0.839 | | |
| <i>p</i> | 0.019 | 0.021 | 0.079 | 0.205 | 0.043 | 0.065 | | |
| <u>Value-based Participants</u> | | | | | | | | |
| | P01 | P02 | P05 | P06 | P07 | P11 | P13 | P14 |
| Means | | | | | | | | |
| Baseline | 2.25 | 6.33 | 4.50 | 7.50 | 5.60 | 5.20 | 3.40 | 5.00 |
| Homework | 6.83 | 8.67 | 6.83 | 7.83 | 7.67 | 8.83 | 7.50 | 8.50 |
| Nonhomework | 4.33 | 6.83 | 5.83 | 8.17 | 6.33 | 7.50 | 6.67 | 7.50 |
| Homework | | | | | | | | |
| PND ^a | 100.00%** | 66.67%* | 83.33%** | 0.00% | 0.00% | 0.00% | 100.00%** | 100.00%** |
| <i>p</i> | 0.003 | 0.021 | 0.016 | 1.000 | 1.000 | 1.000 | 0.001 | 0.003 |
| SMA <i>r</i> ^b | 0.932** | 0.808* | 0.831 | 0.162 | 0.725* | 0.656 | 0.885** | 0.918** |
| <i>p</i> | 0.003 | 0.016 | 0.060 | 0.591 | 0.021 | 0.075 | 0.005 | 0.009 |
| Nonhomework | | | | | | | | |
| PND ^a | 83.33%** | 16.67% | 33.33% | 0.00% | 0.00% | 0.00% | 100.00%** | 66.67% |
| <i>p</i> | 0.016 | 0.366 | 0.260 | 1.000 | 1.000 | 1.000 | 0.001 | 0.052 |
| SMA <i>r</i> ^b | 0.848* | 0.167 | <i>0.461</i> | 0.275 | <i>0.350</i> | <i>0.452</i> | 0.857* | 0.752 |
| <i>p</i> | 0.012 | 0.487 | 0.318 | 0.494 | 0.226 | 0.273 | 0.011 | 0.066 |

Note. Entries in italics denote “effective” or medium effect sizes; entries in bold “very effective” or large effect sizes. ^aPND = Percentage of nonoverlapping data. ^b*r* = Pearson’s correlation between overall mood and the phase (i.e., treatment effect size).

* *p* ≤ .05. ** *p* ≤ .01.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 14

Correlations Between Macrolevel PrePosttreatment Process and Posttreatment-FU Outcome Change Scores

| Measures | All Participants (<i>N</i> = 14) | Mood-based (<i>n</i> = 6) | Valued-based (<i>n</i> = 8) | <i>z</i> | <i>p</i> |
|-----------------------|--------------------------------------|-------------------------------|---------------------------------|----------|----------|
| | <i>r</i> | <i>r</i> | <i>r</i> | | |
| VLQ | | | | | |
| BDI-II | .28 | .32 | .08 | 0.34 | .73 |
| HRS-D | .47 | .40 | .63 | -0.44 | .66 |
| ORS | -.31 | -.42 | -.37 | -0.08 | .94 |
| BAI | -.08 | -.10 | .11 | -0.29 | .77 |
| PAL Frequency | | | | | |
| BDI-II | -.26 | -.13 | -.50 | 0.57 | .57 |
| HRS-D | .19 | .04 | .33 | -0.41 | .68 |
| ORS | -.11 | -.09 | -.22 | 0.18 | .86 |
| BAI | -.01 | -.63 | .23 | -1.34 | .18 |
| PAL Obtained Pleasure | | | | | |
| BDI-II | -.43 | -.21 | -.68 | 0.84 | .40 |
| HRS-D | .06 | .09 | .06 | 0.04 | .97 |
| ORS | -.03 | -.13 | .04 | -0.23 | .82 |
| BAI | -.04 | -.60 | .06 | -1.03 | .30 |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 15

Time-Lagged Correlations Between Microlevel Overall Mood and Outcome Variables by Protocols

| | All Participants | | Mood-based | | Valued-based | | z^b | p |
|---------------|------------------|--------|------------|------|--------------|-------|-------|-----|
| | n^a | r | n | r | n | r | | |
| BDI-II | | | | | | | | |
| Lag 1 | 84 | .45** | 36 | .41* | 48 | .47** | -0.32 | .75 |
| Lag 2 | 70 | .20 | 30 | .39 | 40 | .77** | -2.40 | .02 |
| Lag 3 | 56 | .37** | 24 | .06 | 32 | .71** | -2.89 | .00 |
| Lag 4 | 42 | .56** | 18 | .46 | 24 | .68** | -0.98 | .33 |
| Lag 5 | 28 | .49** | 12 | .40 | 16 | .50* | -0.29 | .77 |
| ORS | | | | | | | | |
| Lag 1 | 84 | .60** | 36 | .45 | 48 | .69** | -1.58 | .11 |
| Lag 2 | 70 | -.65** | 30 | .43 | 40 | .66** | -1.32 | .19 |
| Lag 3 | 56 | .40** | 24 | .05 | 32 | .63** | -2.41 | .02 |
| Lag 4 | 42 | .51** | 18 | .37 | 24 | .59** | -0.86 | .39 |
| Lag 5 | 28 | .37 | 12 | .23 | 16 | .50* | -0.73 | .47 |

^aReflects the total number of paired data points included in the analyses. ^bResults of testing for protocol differences in coefficients.

* $p \leq .05$. ** $p \leq .01$.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 16

Summary of Significant Time-Lagged Correlations Between Microlevel Process and Outcome Variables by Participants

| | Mood-based | Value-based |
|----------------------------------|------------------------------|---------------------------------|
| Mood | | |
| BDI-II | P12(4) ^a = 1.00** | P02(2) = .91* P11(2) = .96** |
| ORS | None | P01(4) = .91* P14(1) = .96** |
| Activity Level | | |
| BDI-II | None | None |
| ORS | None | P13(2) = .89* |
| Enjoyment of Homework | | |
| BDI-II | None | None |
| ORS | None | None |
| Enjoyment of Nonhomework | | |
| BDI-II | P12(1) = .90* | None |
| ORS | None | P02(1) = .89* |
| Importance of Homework | | |
| BDI-II | None | P02(3) = 1.00** |
| ORS | None | None |
| Importance of Nonhomework | | |
| BDI-II | None | P02(1) = .91* P11(1) = .99** |
| ORS | None | P11(1) = .94* |

^aNumbers in parentheses denote time lags.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 17

Time-Lagged Correlations Between Microlevel Activity Level and Outcome Variables by Protocols

| | All Participants | | Mood-based | | Valued-based | | z^b | p |
|---------------------|------------------|------|------------|------|--------------|------|-------|------|
| | n^a | r | n | r | n | r | | |
| BDI-II change score | | | | | | | | |
| Lag 1 | 84 | -.05 | 36 | -.03 | 48 | -.08 | 0.22 | 0.83 |
| Lag 2 | 70 | .02 | 30 | .07 | 40 | -.05 | 0.47 | 0.64 |
| Lag 3 | 56 | -.04 | 24 | .01 | 32 | -.13 | 0.49 | 0.62 |
| Lag 4 | 42 | -.02 | 18 | .01 | 24 | -.11 | 0.36 | 0.72 |
| Lag 5 | 28 | -.13 | 12 | -.14 | 16 | -.10 | -0.09 | 0.93 |
| ORS change score | | | | | | | | |
| Lag 1 | 84 | -.11 | 36 | -.07 | 48 | -.16 | 0.40 | 0.69 |
| Lag 2 | 70 | .09 | 30 | .12 | 40 | .03 | 0.36 | 0.72 |
| Lag 3 | 56 | .02 | 24 | .20 | 32 | -.28 | 1.71 | 0.09 |
| Lag 4 | 42 | -.10 | 18 | -.04 | 24 | -.24 | 0.61 | 0.54 |
| Lag 5 | 28 | .16 | 12 | .39 | 16 | -.39 | 1.90 | 0.06 |

^aReflects the total number of paired data points included in the analyses. ^bResults of testing for protocol differences in coefficients.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 18

Time-Lagged Correlations Between Microlevel Enjoyment Ratings and Outcome Variables by Protocols

| | All Participants | | <u>Homework</u> | | | | | | <u>Nonhomework</u> | | | | |
|---------------|-----------------------|----------|-----------------|----------|-------------|----------|-----------------------|----------|--------------------|----------|-------------|----------|-----------------------|
| | <i>n</i> ^a | <i>r</i> | Mood-based | | Value-based | | <i>z</i> ^b | <i>p</i> | <i>r</i> | <i>r</i> | Value-based | | |
| | | | <i>n</i> | <i>r</i> | <i>n</i> | <i>r</i> | | | | | <i>r</i> | <i>r</i> | <i>z</i> ^b |
| BDI-II | | | | | | | | | | | | | |
| Lag 1 | 70 | .09 | 30 | .03 | 40 | .09 | -0.24 | 0.81 | .37** | .20 | .48** | -1.27 | 0.20 |
| Lag 2 | 56 | .03 | 24 | -.02 | 32 | .01 | -0.10 | 0.92 | .28* | .12 | .39* | -1.02 | 0.31 |
| Lag 3 | 42 | -.03 | 18 | -.31 | 24 | .25 | -1.70 | 0.09 | .13 | -.26 | .39 | -2.01 | 0.04 |
| Lag 4 | 28 | .03 | 12 | -.35 | 16 | .19 | -1.29 | 0.20 | .20 | -.48 | .48 | -2.41 | 0.02 |
| ORS | | | | | | | | | | | | | |
| Lag 1 | 70 | .21 | 30 | .03 | 40 | .34* | -1.28 | 0.20 | .61** | .22 | .79** | -3.35 | 0.00 |
| Lag 2 | 56 | .18 | 24 | .03 | 32 | .29 | -0.94 | 0.35 | .50** | .09 | .71** | -2.78 | 0.01 |
| Lag 3 | 42 | .09 | 18 | -.24 | 24 | .35 | -1.81 | 0.07 | .42** | -.28 | .71** | -3.48 | 0.00 |
| Lag 4 | 28 | .00 | 12 | -.41 | 16 | .29 | -1.69 | 0.09 | .48** | -.36 | .72** | -2.96 | 0.00 |

^aReflects the total number of paired data points included in the analyses. ^bResults of testing for protocol differences in coefficients.

* $p \leq .05$. ** $p \leq .01$.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 19

Time-Lagged Correlations Between Microlevel Importance Ratings and Outcome Variables by Protocols

| | <u>Homework</u> | | | | | | | | <u>Nonhomework</u> | | | | | |
|---------------|------------------|------|------------|------|-------------|-------|-------|------|--------------------|------|------------|-------|-------------|--|
| | All Participants | | Mood-based | | Value-based | | z^b | p | All Participants | | Mood-based | | Value-based | |
| | n^a | r | n | r | n | r | | | r | r | r | z | p | |
| BDI-II | | | | | | | | | | | | | | |
| Lag 1 | 70 | .09 | 30 | .06 | 40 | .21 | -0.60 | 0.55 | .46** | .24 | .66** | -2.17 | 0.03 | |
| Lag 2 | 56 | .09 | 24 | .04 | 32 | .35* | -1.14 | 0.25 | .37** | .22 | .49** | -1.09 | 0.28 | |
| Lag 3 | 42 | -.04 | 18 | -.20 | 24 | .52** | -2.30 | 0.02 | .24 | .20 | .44* | -0.80 | 0.42 | |
| Lag 4 | 28 | -.02 | 12 | -.24 | 16 | .60* | -2.16 | 0.03 | .30 | -.08 | .49 | -1.42 | 0.16 | |
| ORS | | | | | | | | | | | | | | |
| Lag 1 | 70 | .25* | 30 | .16 | 40 | .45** | -1.28 | 0.20 | .53** | .18 | .79** | -3.51 | 0.00 | |
| Lag 2 | 56 | .24 | 24 | .10 | 32 | .50** | -1.57 | 0.12 | .38** | .15 | .61** | -1.95 | 0.05 | |
| Lag 3 | 42 | .14 | 18 | -.16 | 24 | .66** | -2.82 | 0.05 | .30 | -.12 | .64** | -2.60 | 0.01 | |
| Lag 4 | 28 | .18 | 12 | -.31 | 16 | .77** | -3.09 | 0.00 | .24 | -.34 | .57* | -2.31 | 0.02 | |

^aReflects the total number of paired data points included in the analyses. ^bResults of testing for protocol differences in coefficients.

* $p \leq .05$. ** $p \leq .01$.

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 20

Summary of Major Comparative Protocol Findings

| Type of Analysis | Major Findings |
|----------------------|---|
| Macrolevel Outcome | Equivalent statistical and clinical improvements on interviewer-rated and self-reported depression, anxiety, and quality of life. |
| Microlevel Outcome | No significant protocol differences in the proportion of participants who showed statistically significant or at least medium effect size improvement in depressive symptoms and quality of life during the treatment phase. |
| Macrolevel Process | <p>Valued-living increased significantly from pre to posttreatment only for value-based group, but did not differ significantly from the mood-based protocol at either posttreatment or follow-up.</p> <p>Significant increase in activity level for mood-based participants through the follow-up, but no significant difference compared to valued-based group at either posttreatment or follow-up.</p> <p>Nonsignificant increase in obtained pleasure for both groups.</p> |
| Microlevel Process | No significant protocol differences in the proportion of participants who showed statistically significant or at least medium effect size improvement in any of four process measures during the treatment phase. |
| Macrolevel Mediation | Valued living, activity levels, and obtained pleasure did not mediate any outcome variables for either group. |
| Microlevel Mediation | <p>Increased overall activity levels and enjoyment of homework were unassociated with improvement in depressive symptoms or quality of life during the treatment phase for either protocol.</p> <p>Increased overall mood, enjoyment of nonhomework, and importance of engaging in both homework and nonhomework were more likely to mediate improvement in depressive symptoms and quality of life during the treatment phase for value-based participants.</p> <p>Significant mediating effects at the level of participants were found primarily among those in the value-based group.</p> |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Table 21

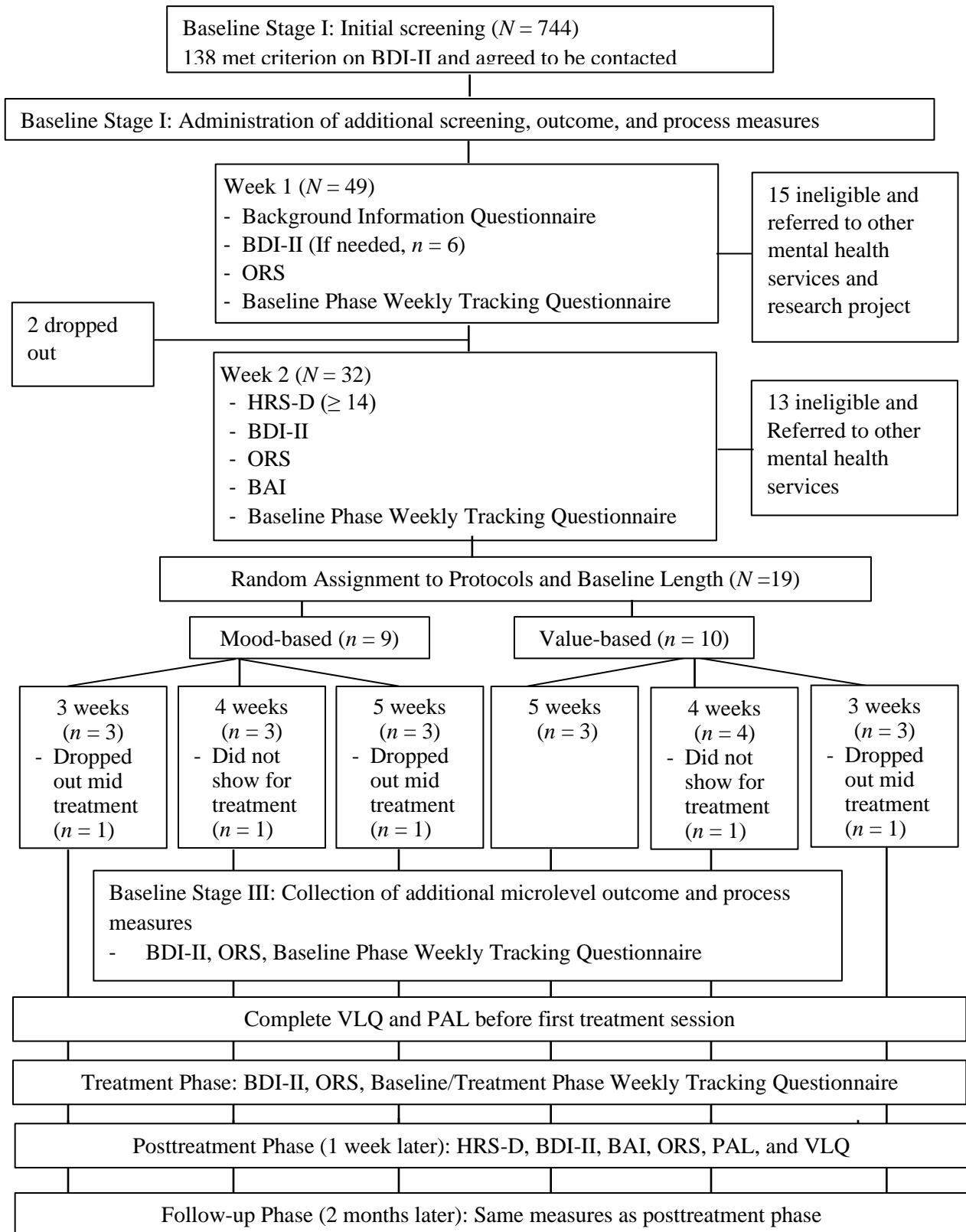
Summary of Hypotheses and Related Findings

| Hypothesis | Prediction | Related Findings |
|---|--|---|
| 1. Macrolevel symptomatic improvement | Greater decrease in BDI-II scores for value-based group; no protocol differences on HRS-D and BAI scores. | Not supported. Equivalent statistical and clinical improvements on self-reported depression, interviewer-rated depression, and self-reported anxiety. |
| 2. Macrolevel quality of life enhancement | Greater improvement in quality of life for value-based group. | Not supported. Equivalent statistical and clinical improvements. |
| 3. Microlevel treatment improvement | No protocol differences in proportion of participants showing improvement, but greater change in value-based participants. | First part only supported. No protocol differences in proportion of participants who improved or in degree of change. |
| 4. Macrolevel mediational effects of increased activation on treatment outcomes | Activity levels would mediate decreased BDI-II scores to a greater degree in the mood-based group. Equivalent mediational effects on other outcomes. | Not supported. Increased activity level did not significantly mediate improvement on any outcome variables. |
| 5. Microlevel mediational effects of increased activation on treatment outcomes | Increased activation would mediate improvement in BDI-II scores and quality of life equally for both protocols. | Not supported. Increased activity levels failed to mediate improvement for either protocol. |
| 6. Moderated mediational effects on treatment outcomes | Obtained pleasure would mediate improvement for mood-based group; valued living for value-based. | Not supported at macrolevel; partially at microlevel. Enhanced overall mood mediated change for both groups, but more so for valued-based. Increased enjoyment and importance of engaging in activities mediated improvements for value-based group only. |

COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 1

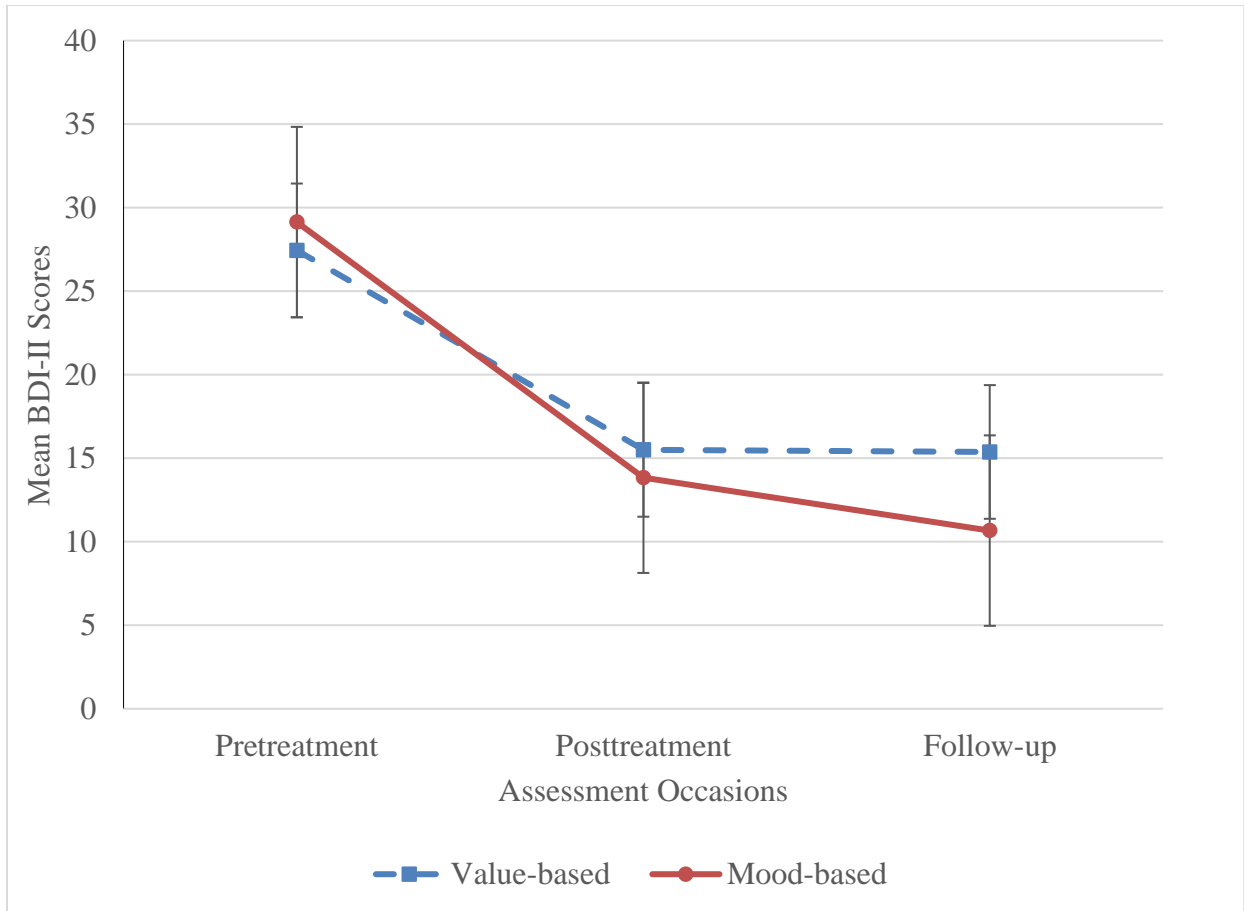
Flow of Participants Through Each Phase of the Study



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 2

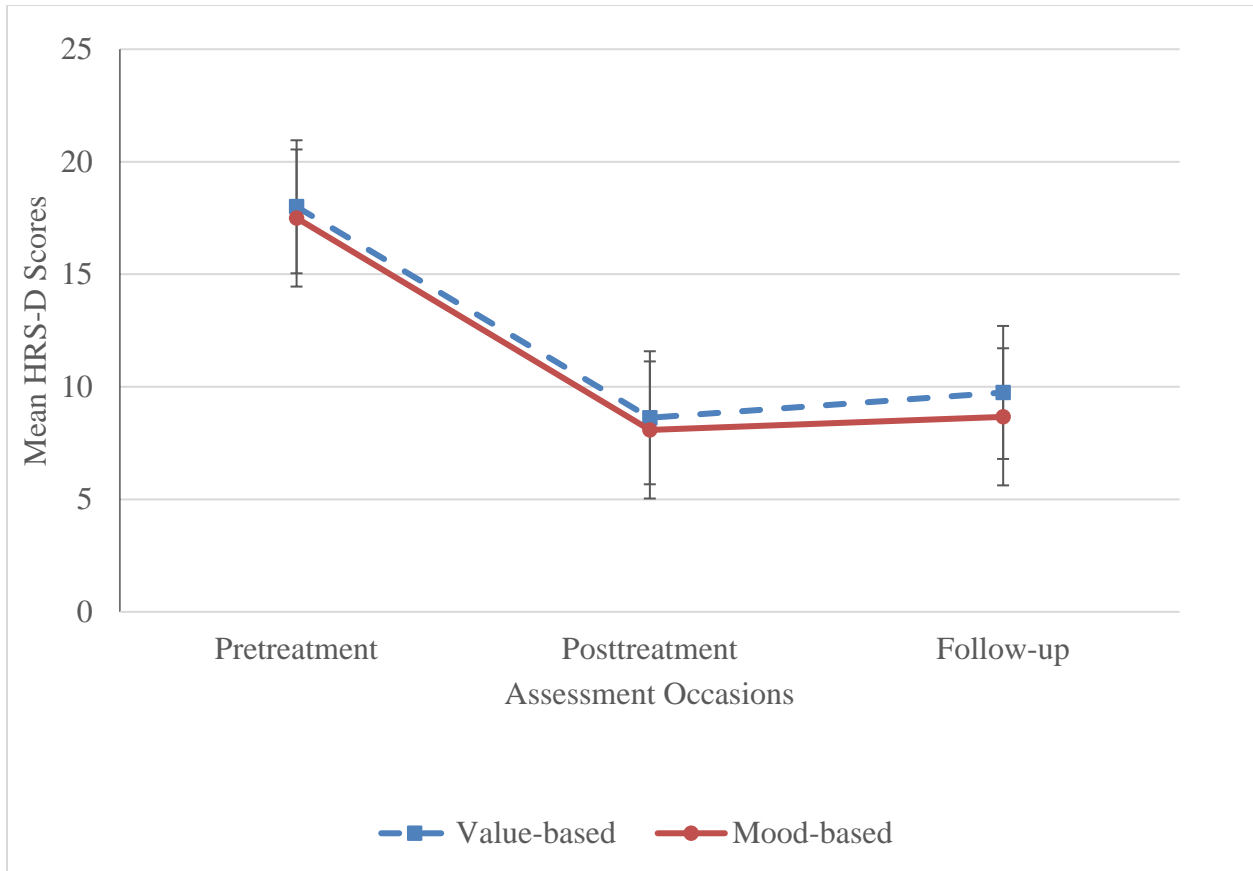
Mean BDI-II Scores for Treatment Groups Across Assessment Occasions



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 3

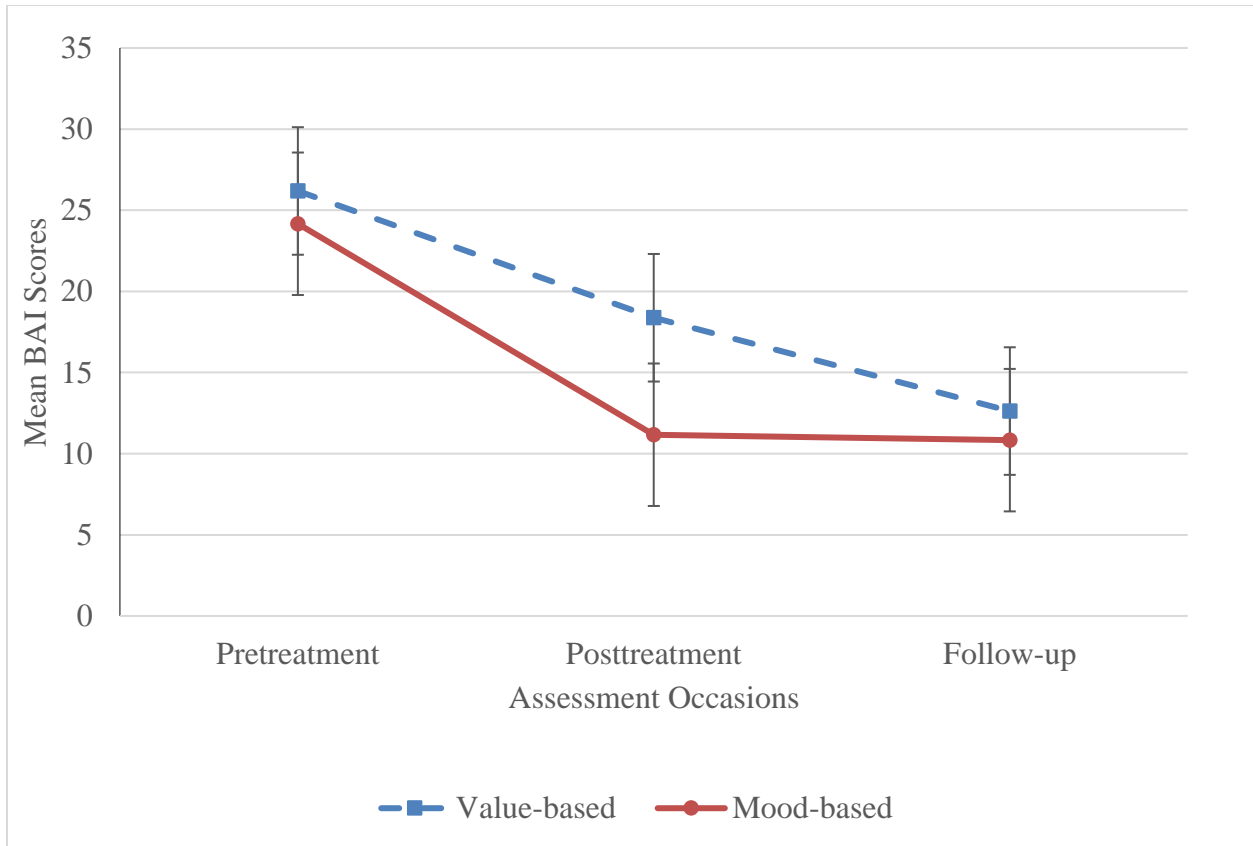
Mean HRS-D Scores for Treatment Groups Across Assessment Occasions



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 4

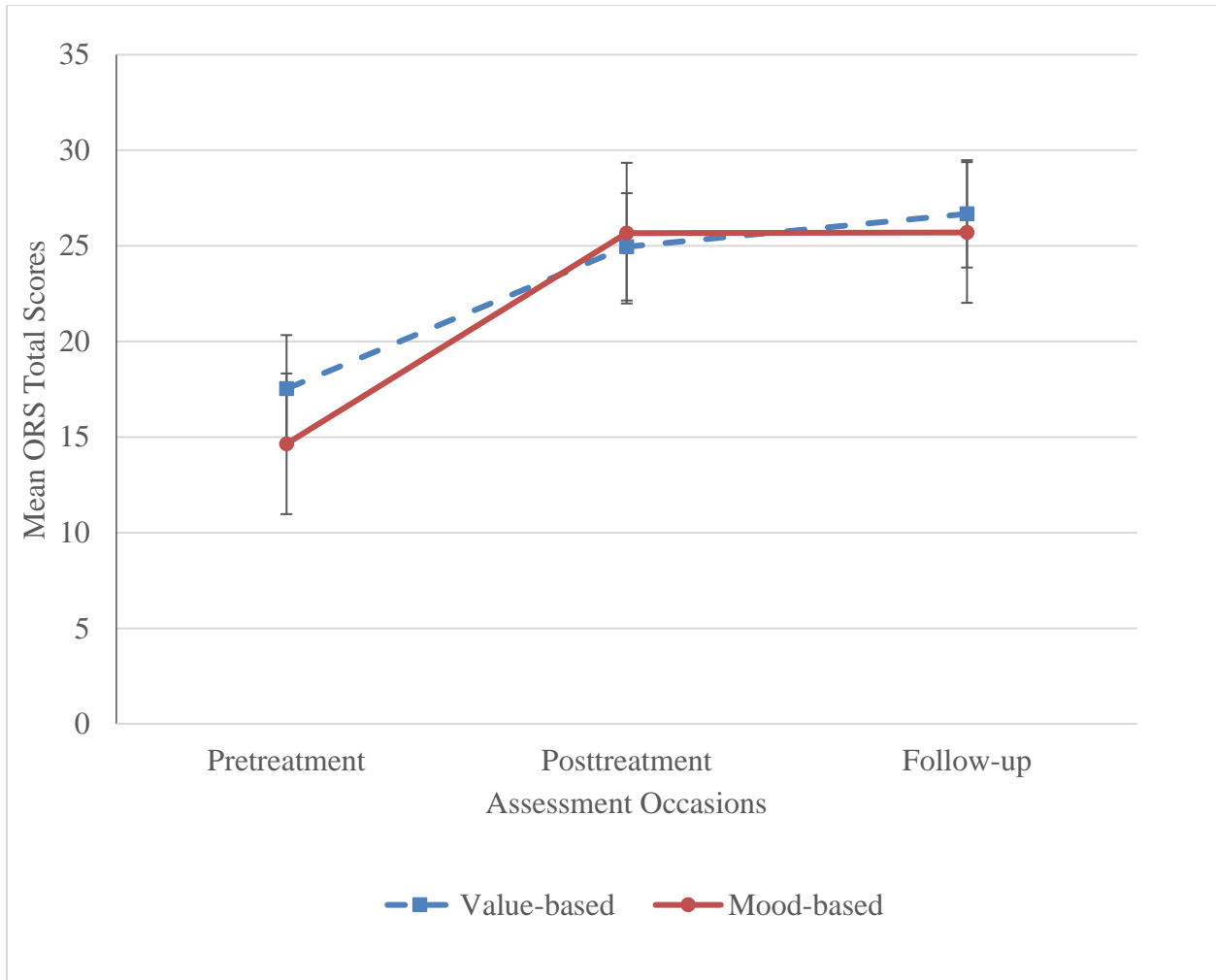
Mean BAI Scores for Treatment Groups Across Assessment Occasions



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 5

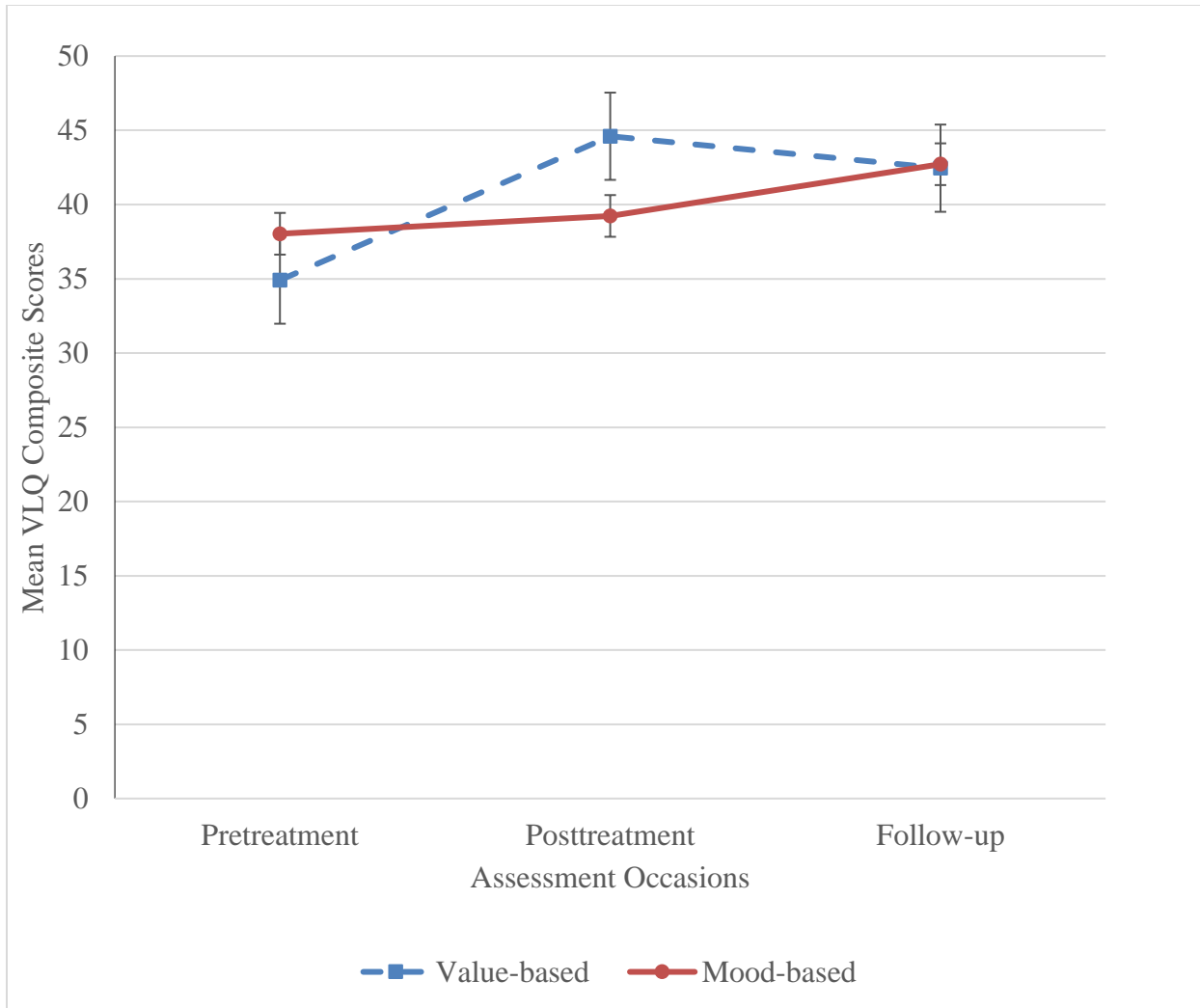
Mean ORS Scores for Treatment Groups Across Assessment Occasions



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 6

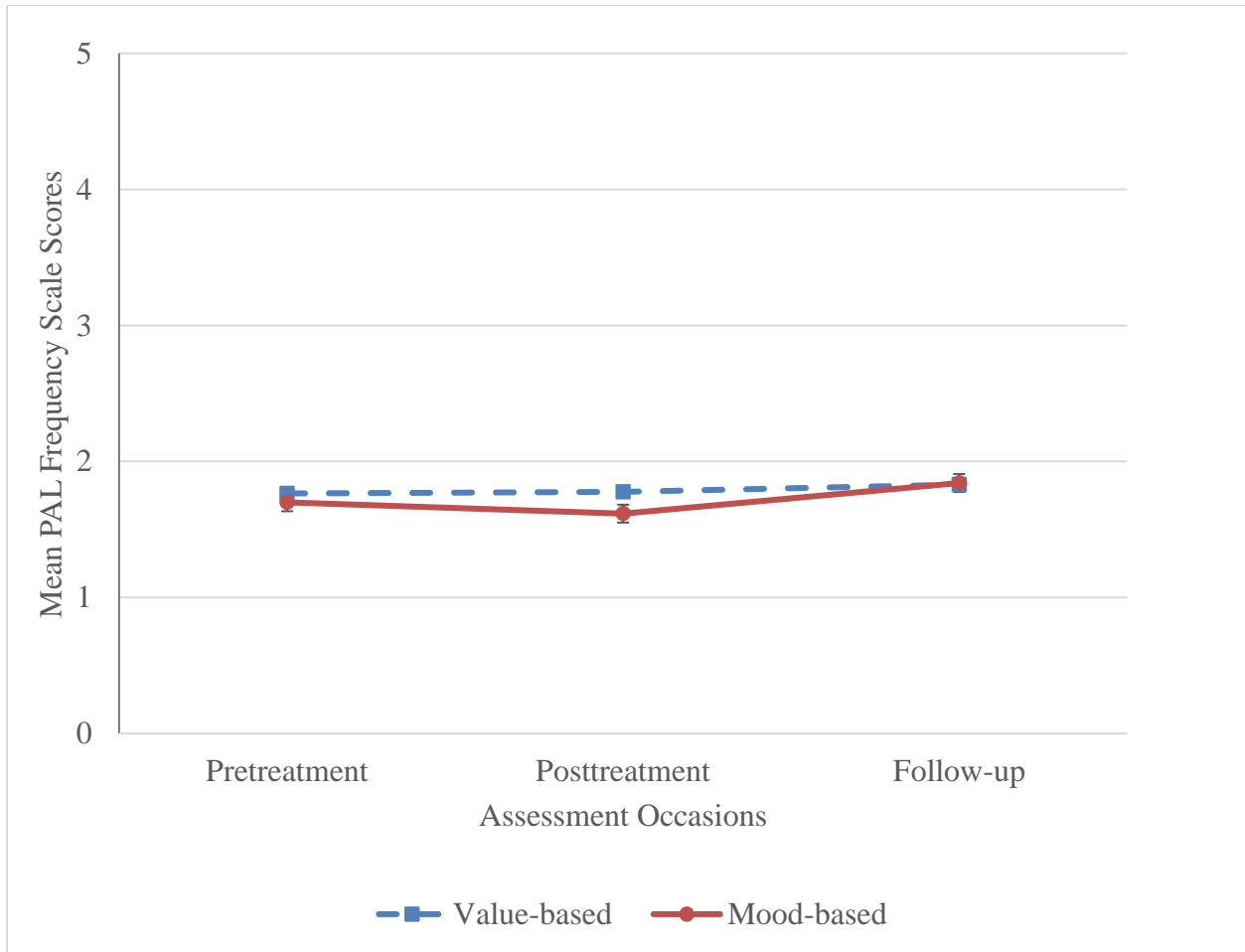
Mean VLQ Composite Scores for Treatment Groups Across Assessment Occasions



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 7

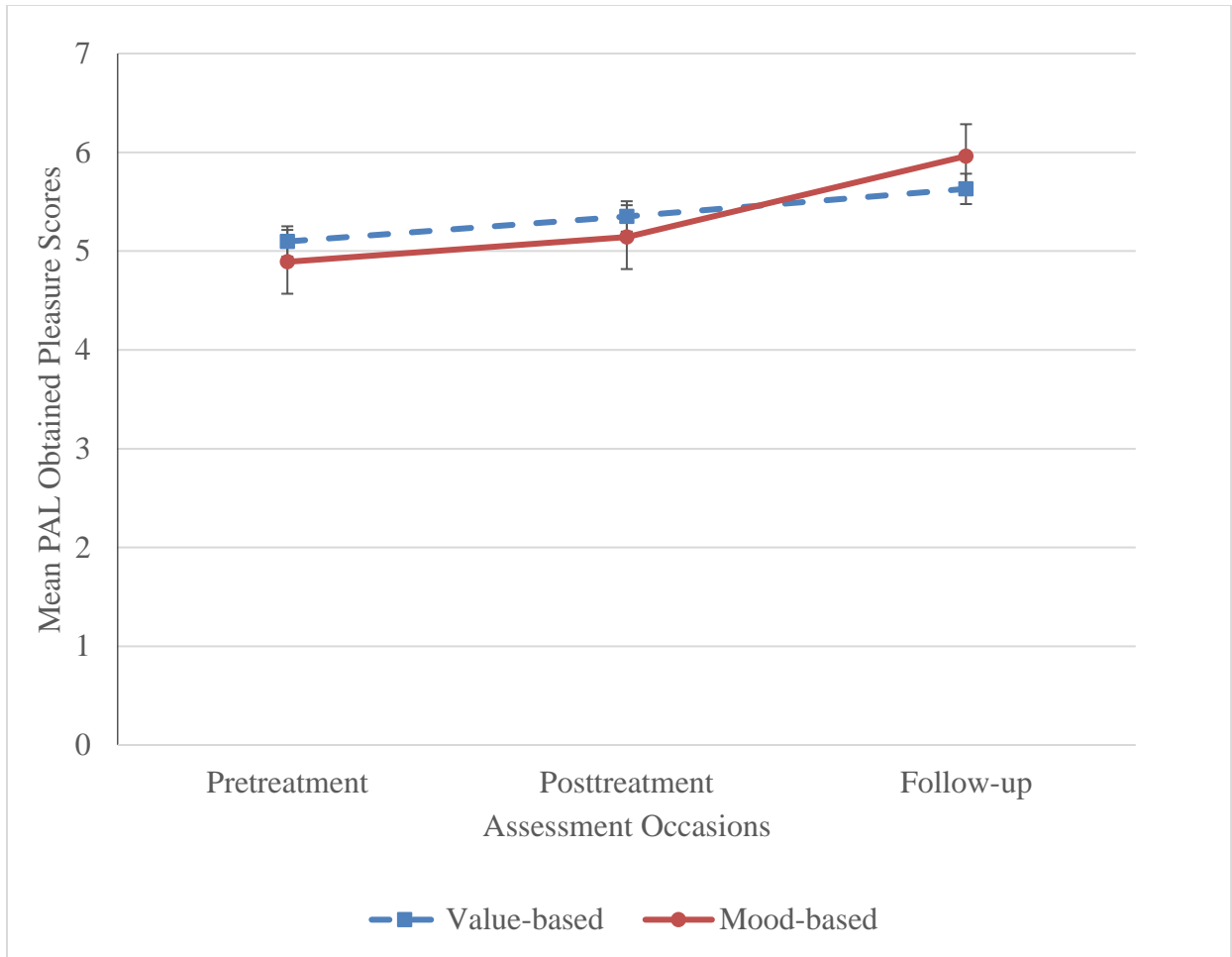
Mean PAL Frequency Scale Scores for Treatment Groups Across Assessment Occasions



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 8

Mean PAL Obtained Pleasure Scores for Treatment Groups Across Assessment Occasions

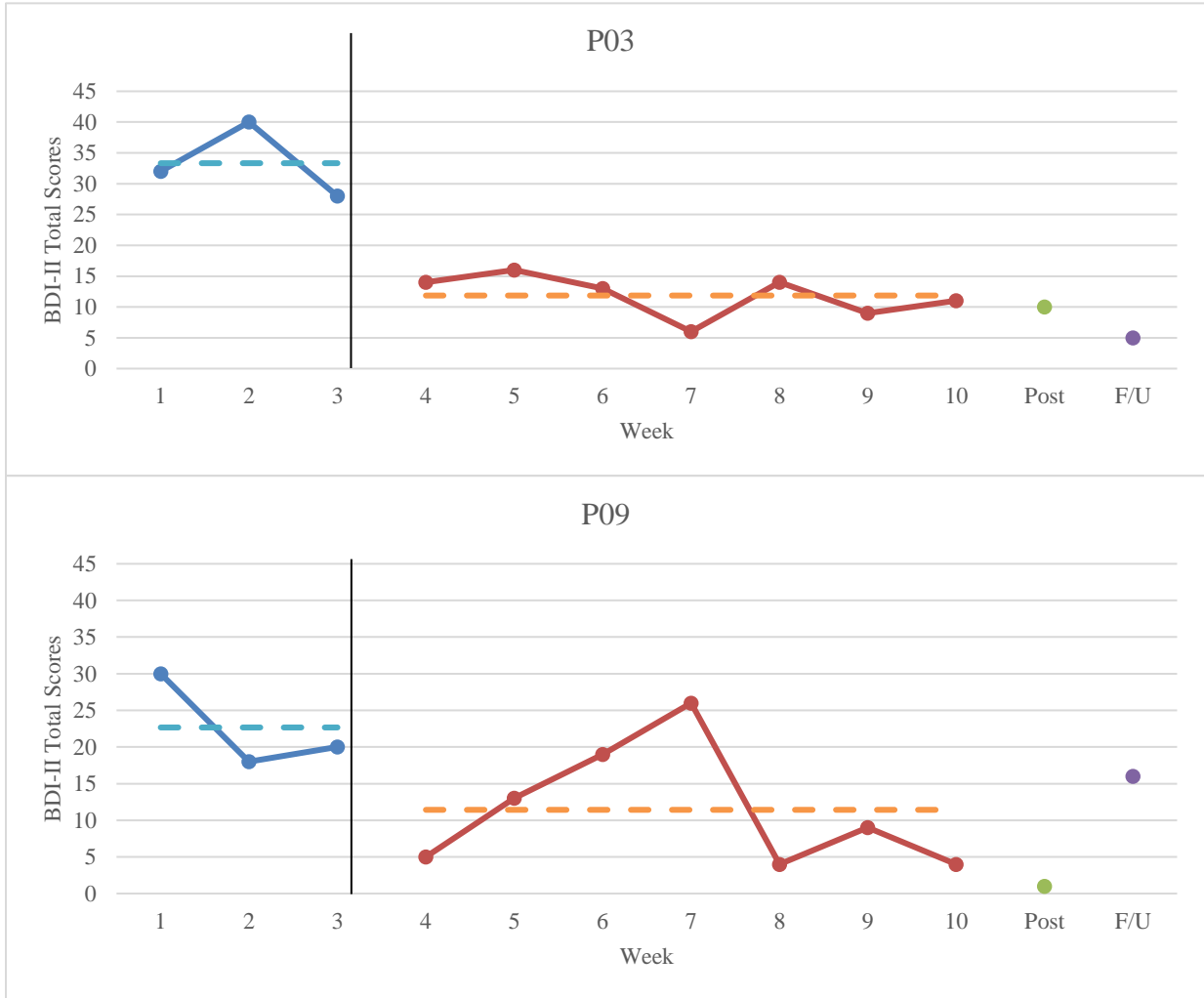


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 9

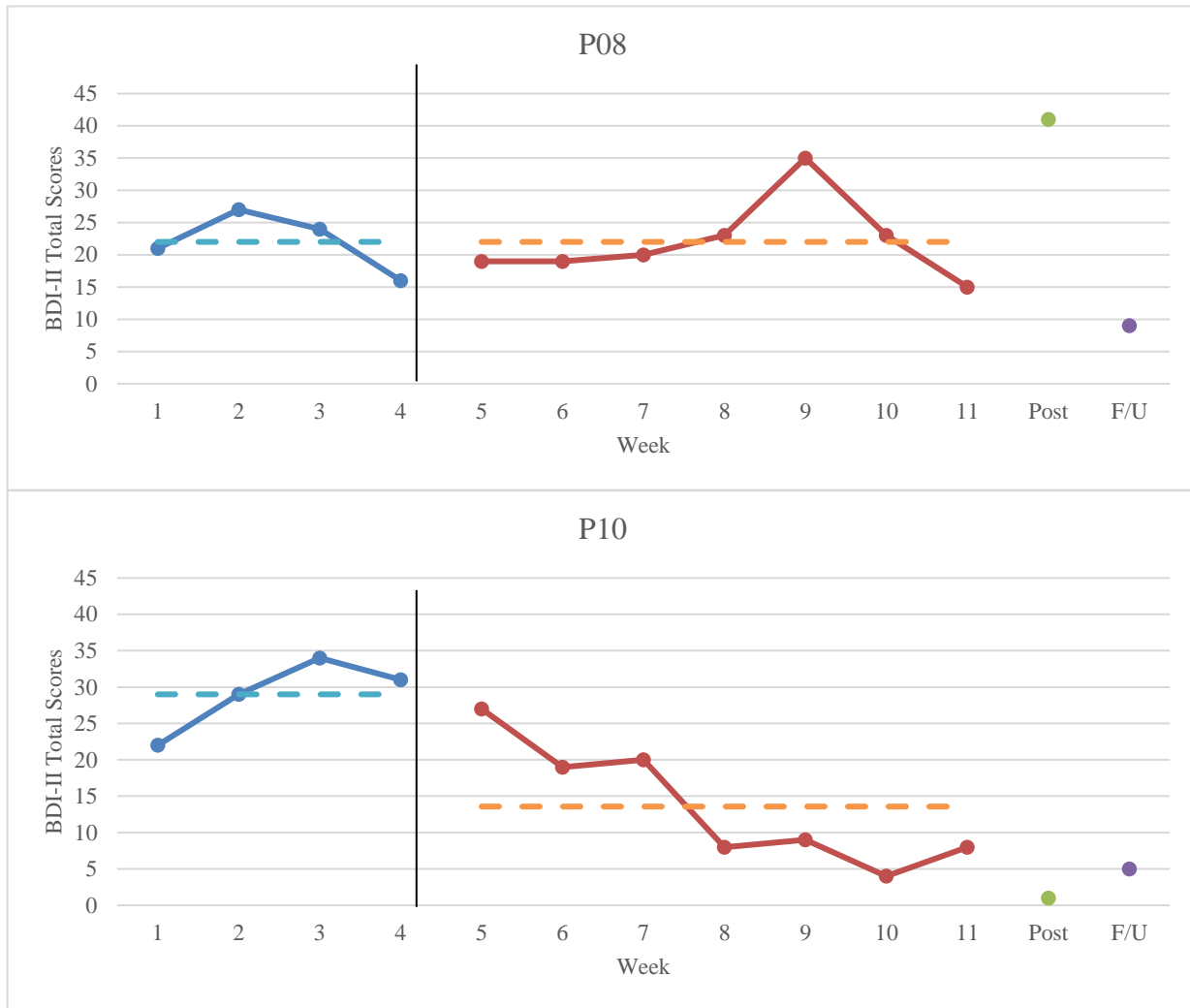
BDI-II Scores for Mood-based Participants Across Study Phases

3-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

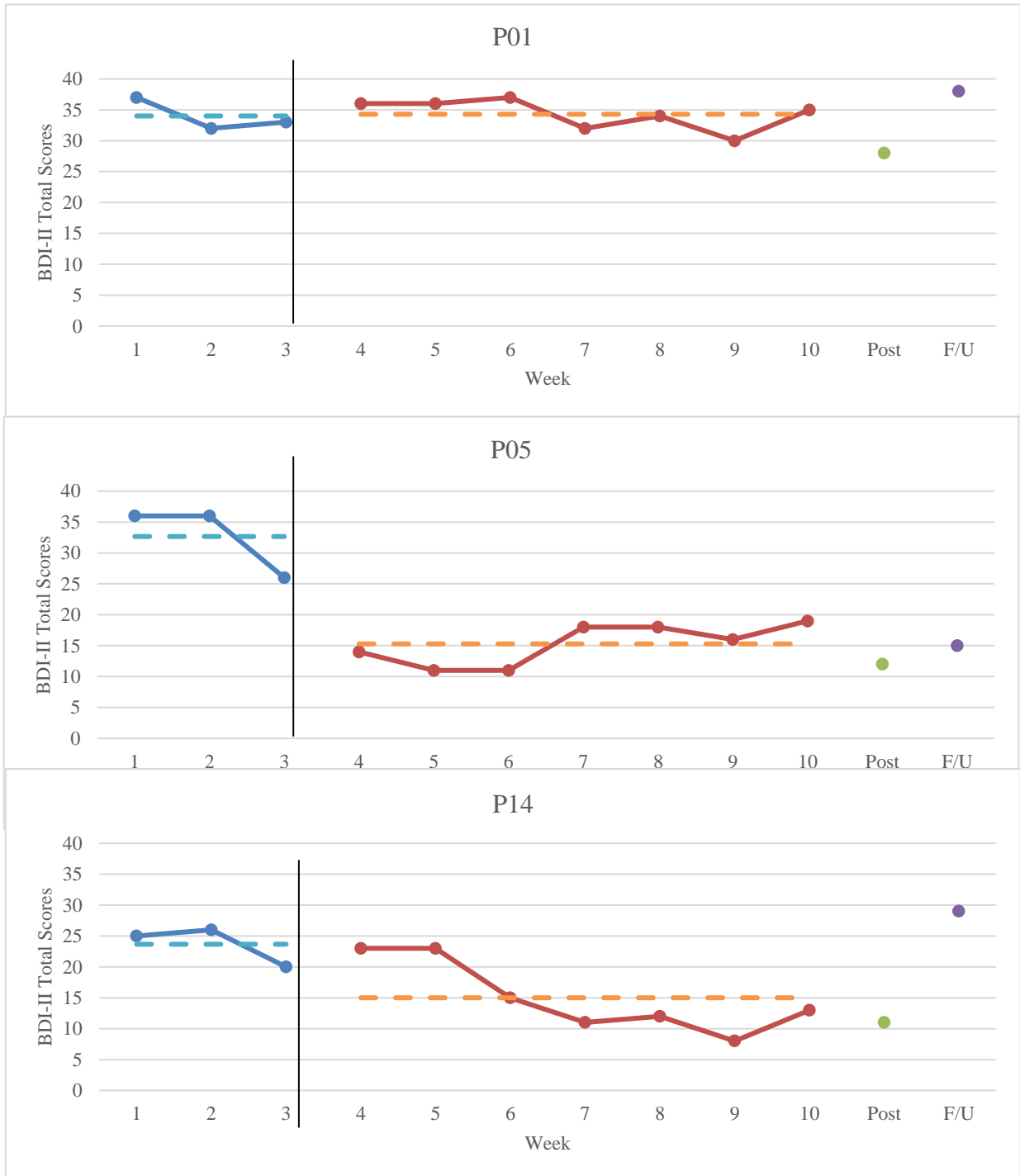


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 10

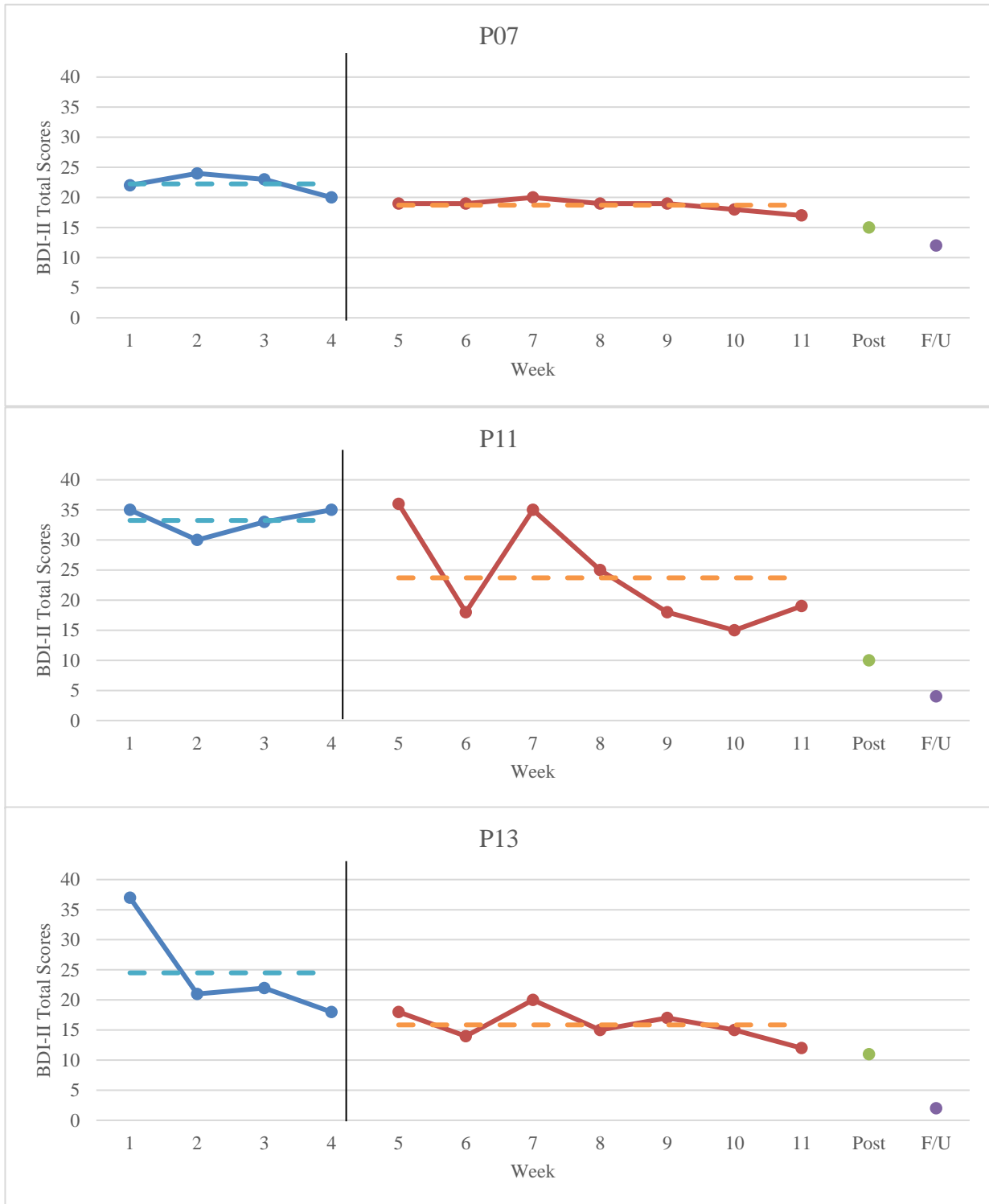
BDI-II Scores for Value-based Participants Across Study Phases

3-Week Baselines



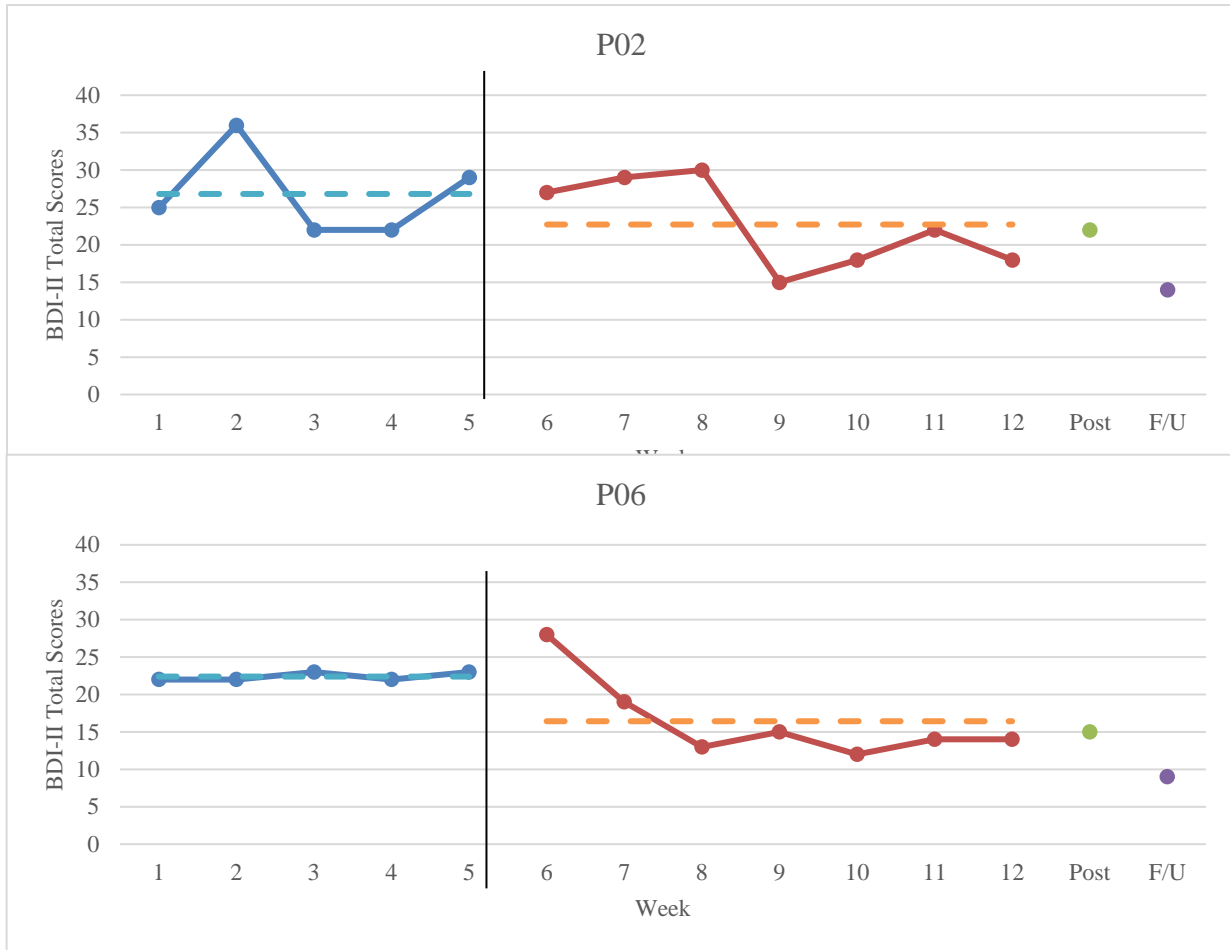
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

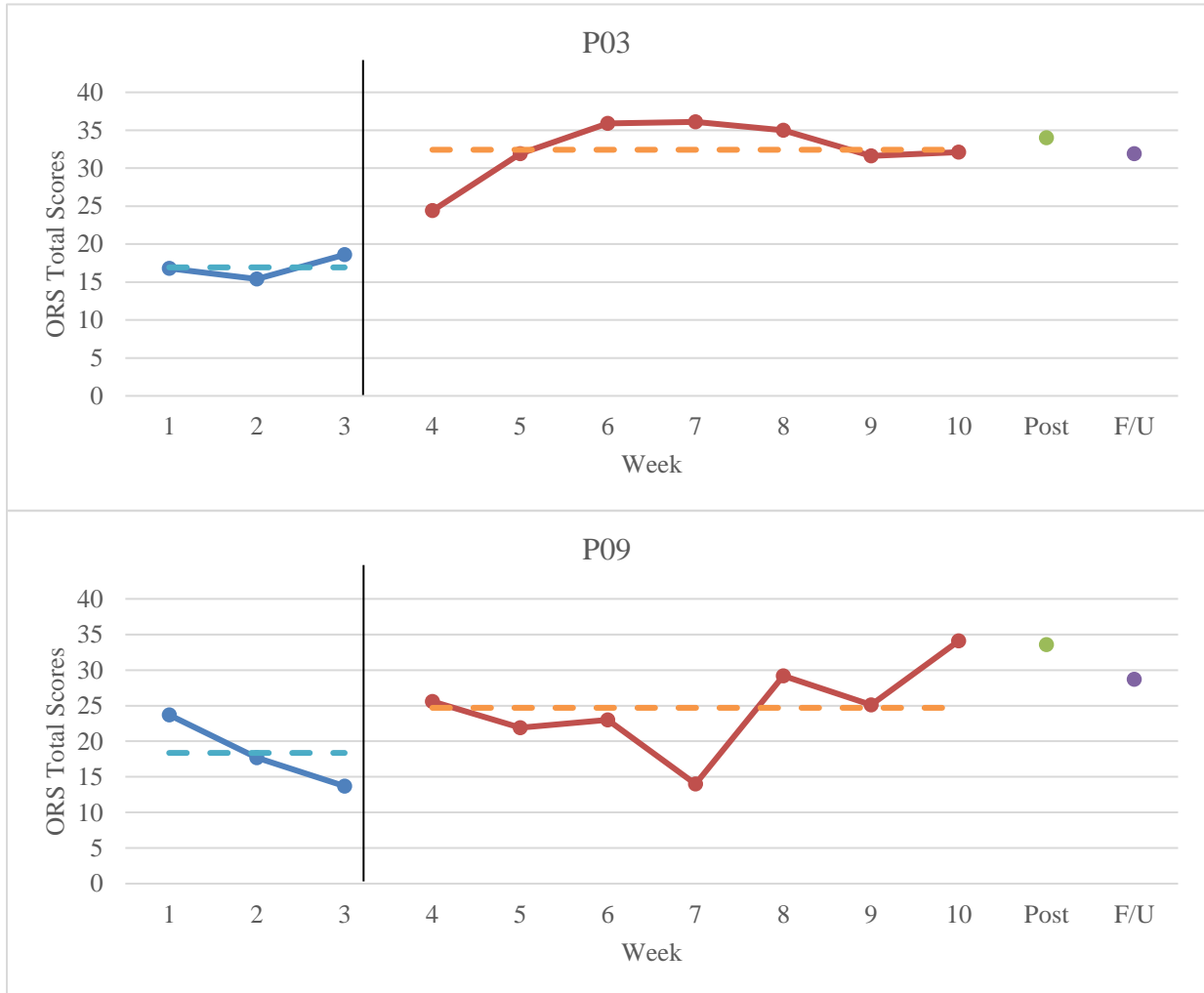


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 11

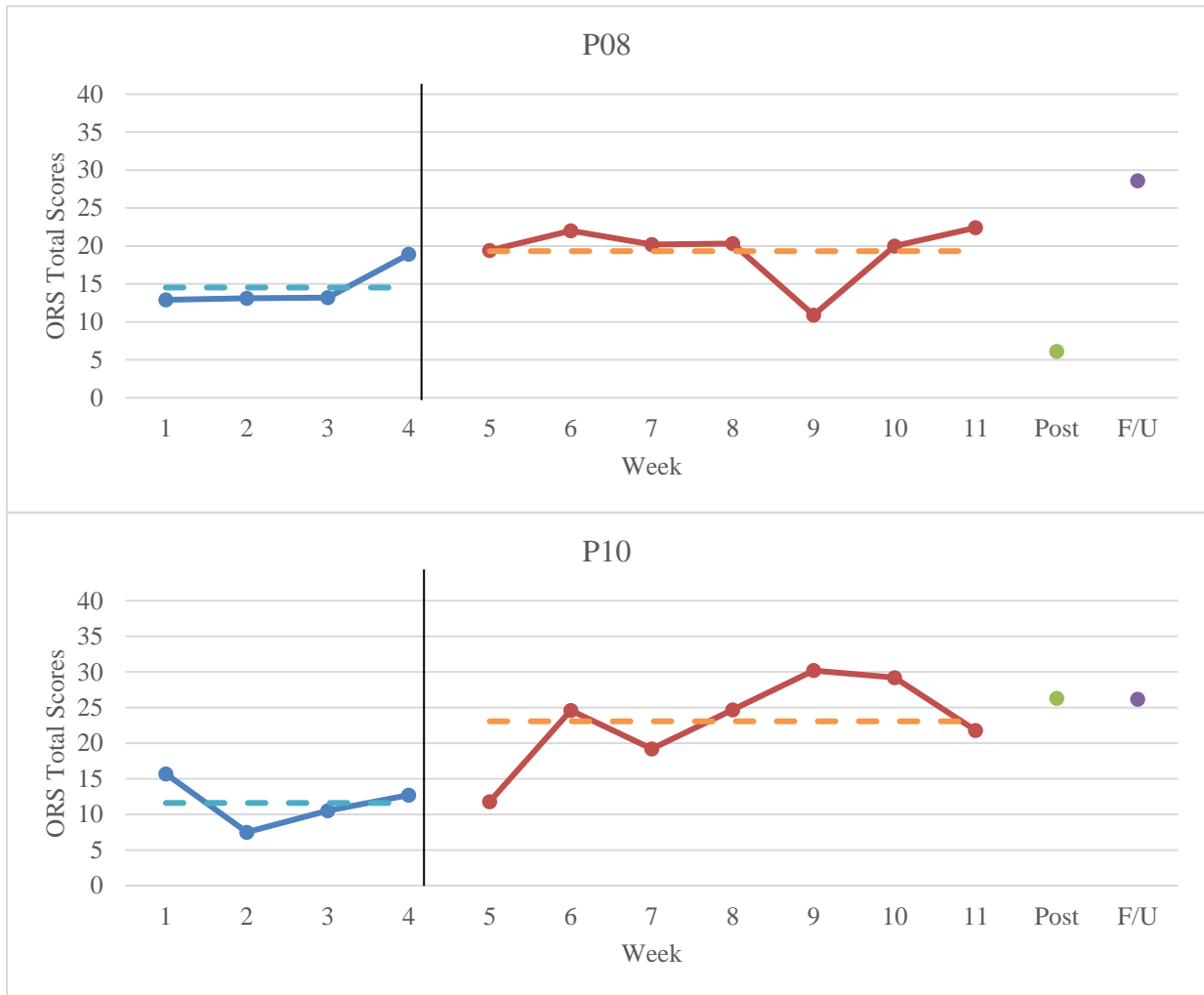
ORS Scores for Mood-based Participants Across Study Phases

3-Week Baselines



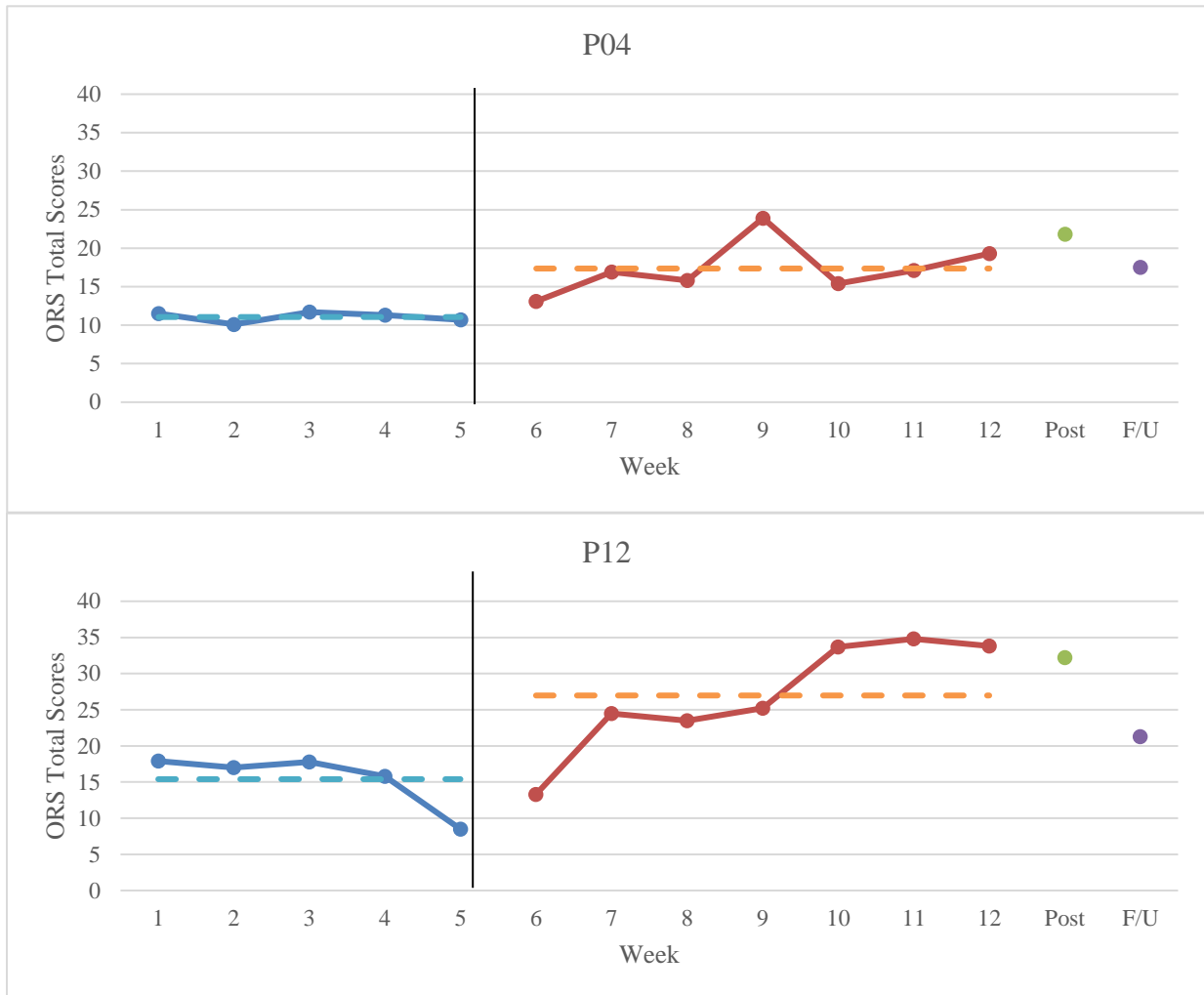
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

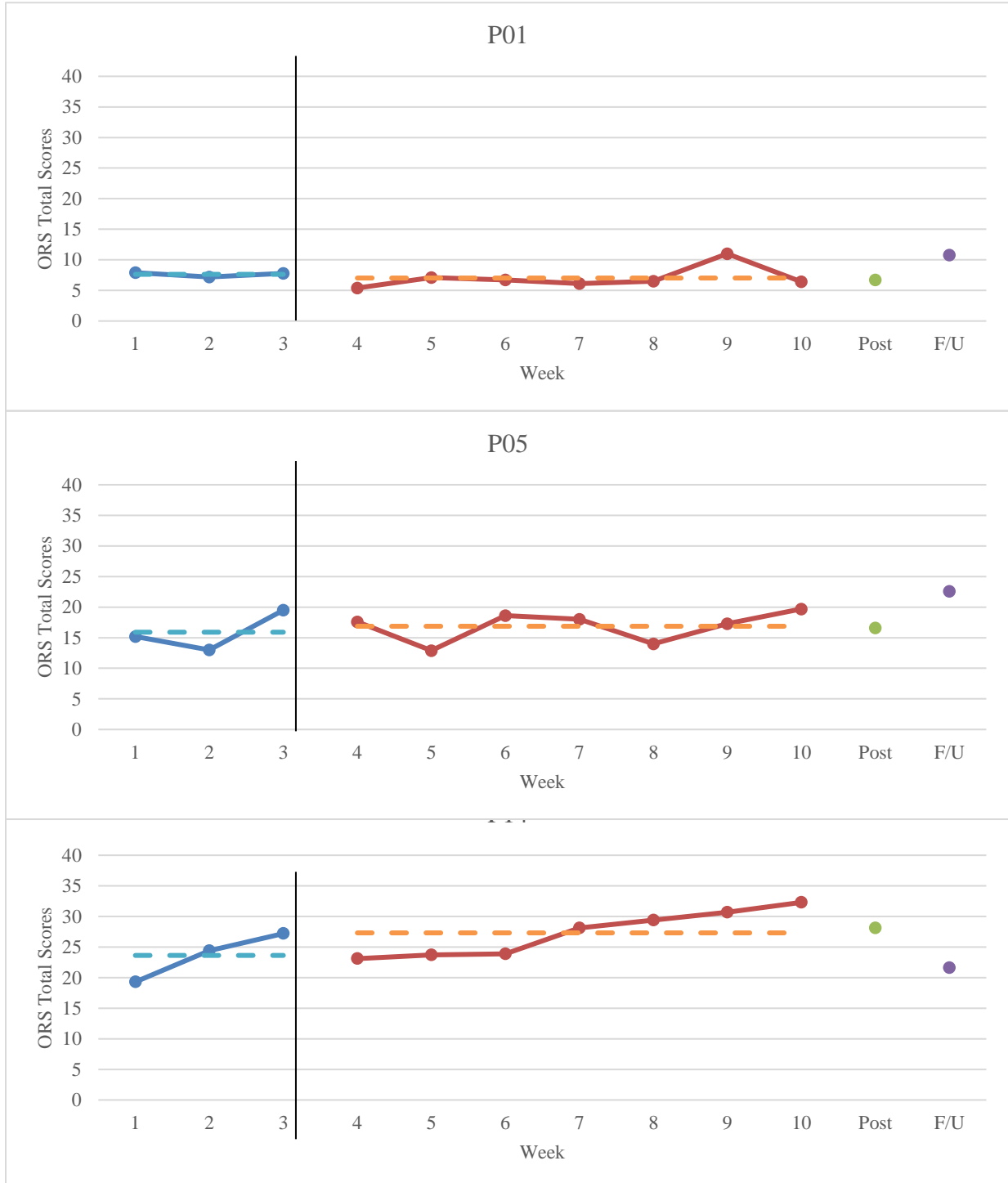


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 12

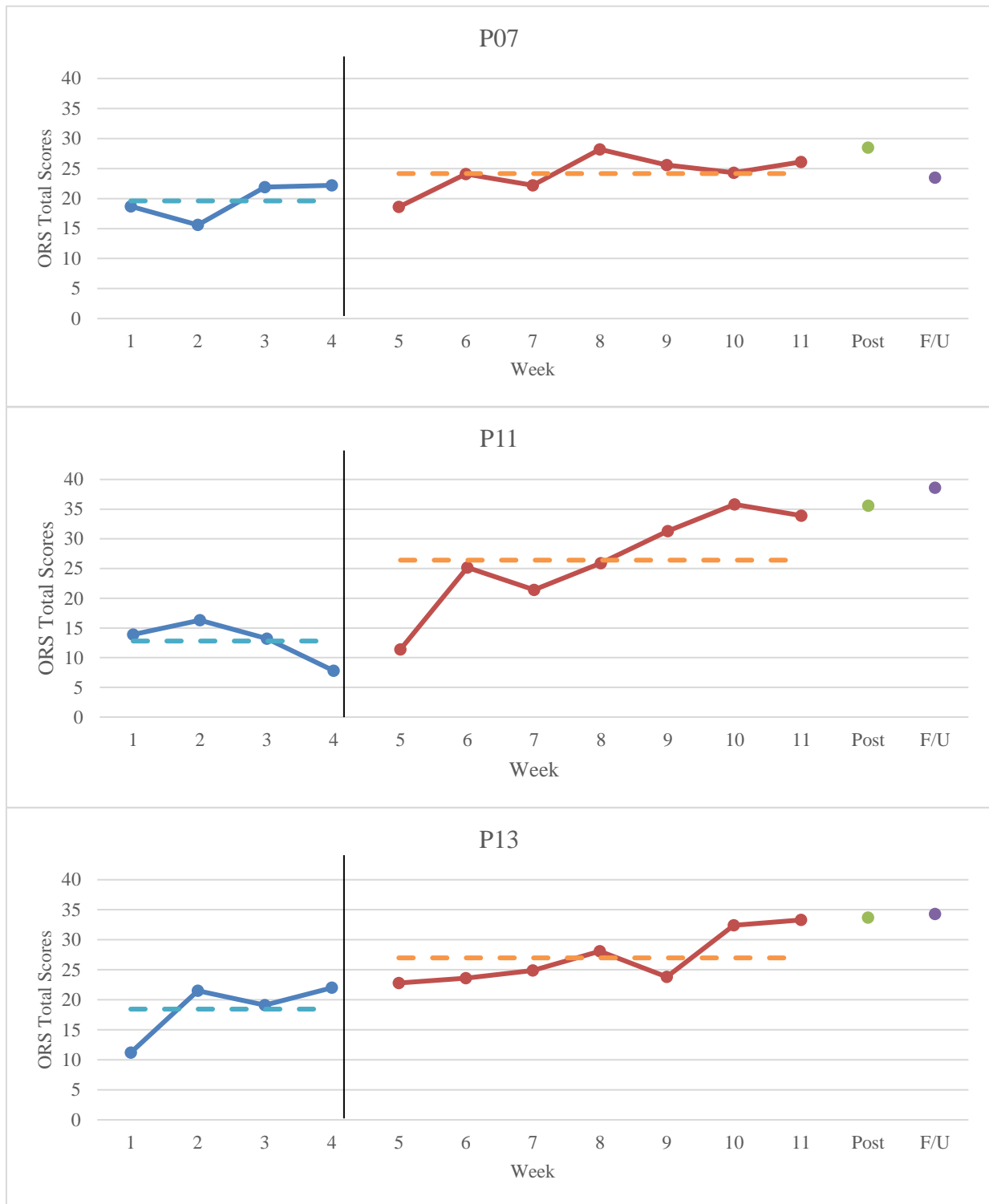
ORS Scores for Value-based Participants Across Study Phases

3-Week Baselines



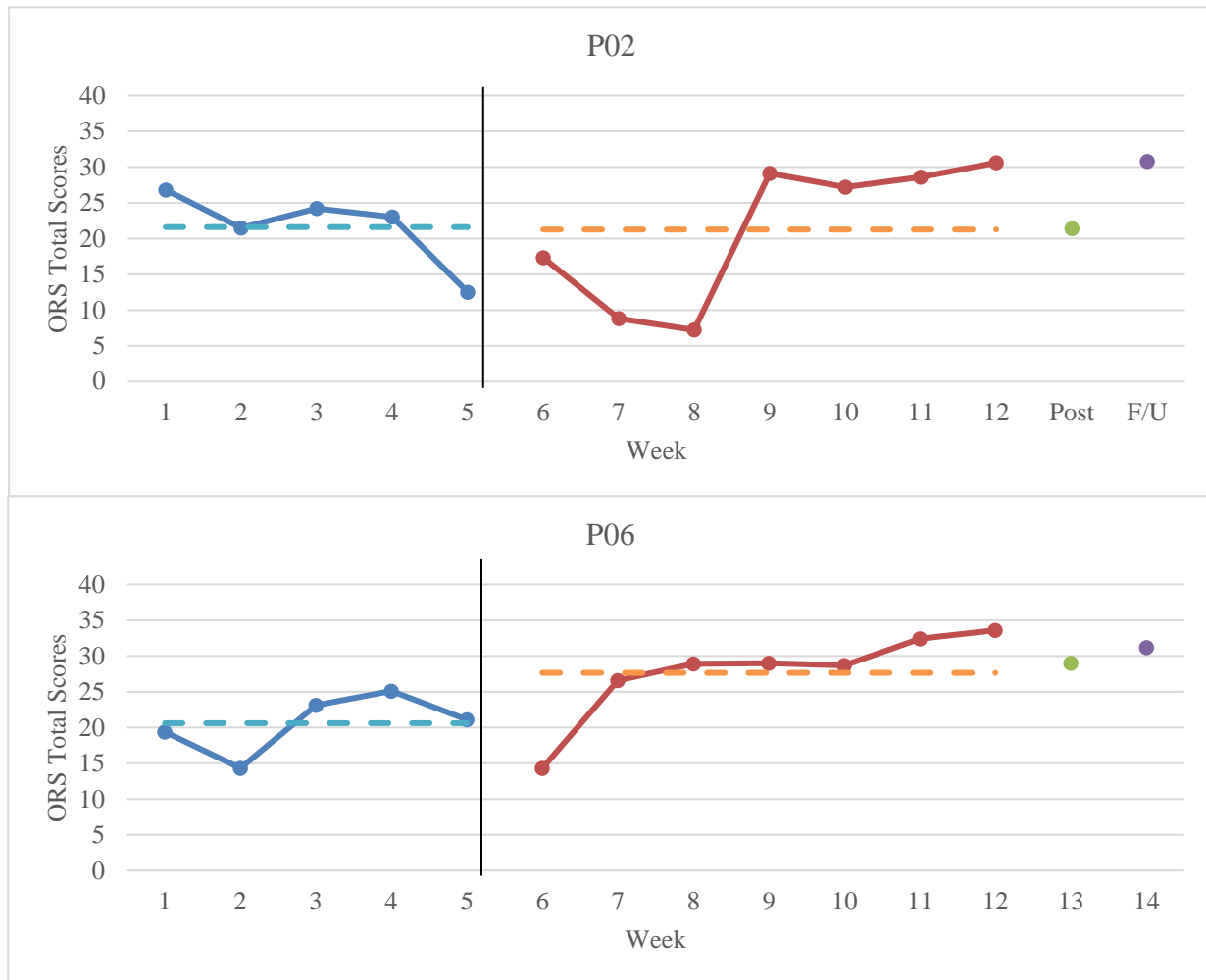
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

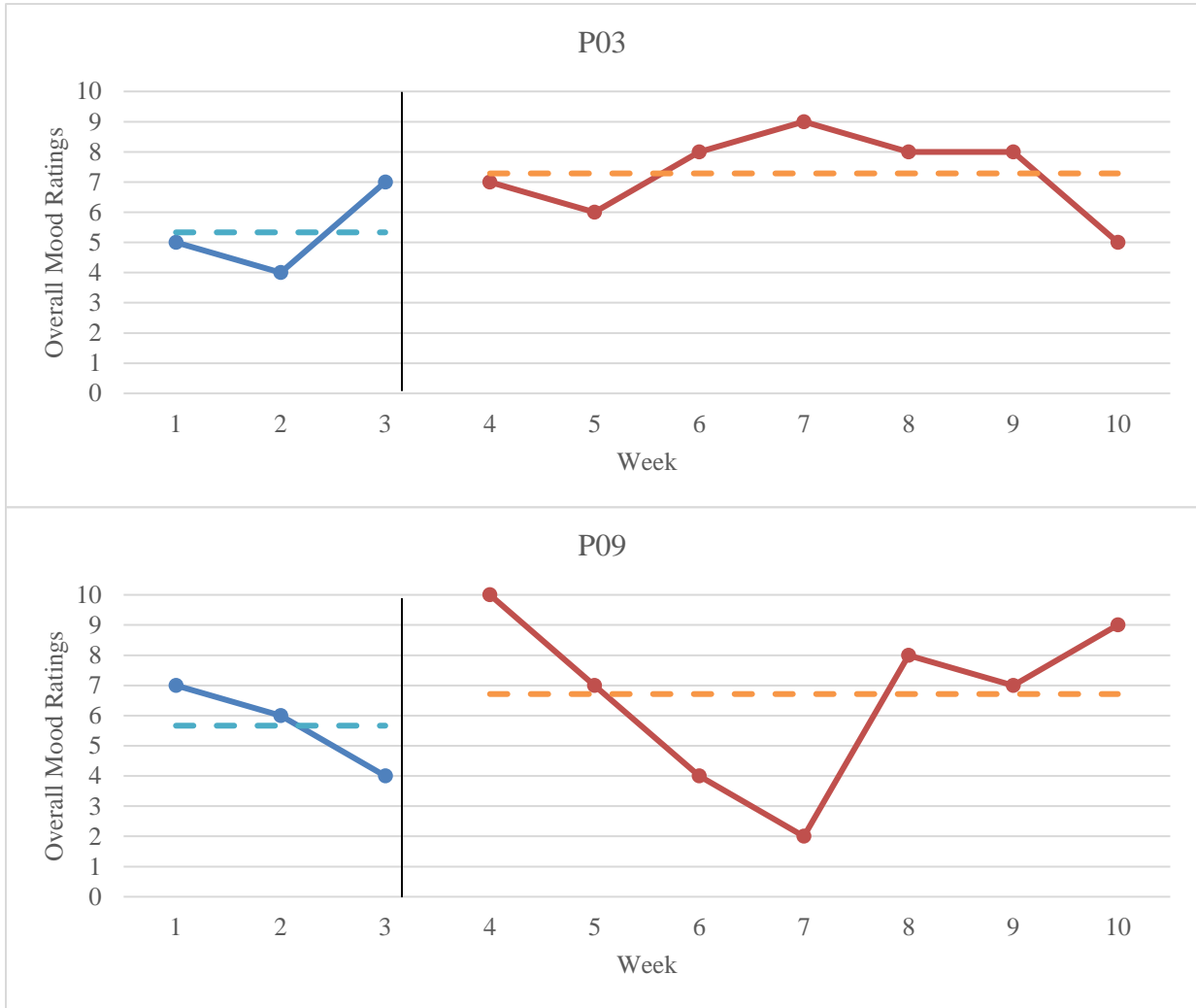


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 13

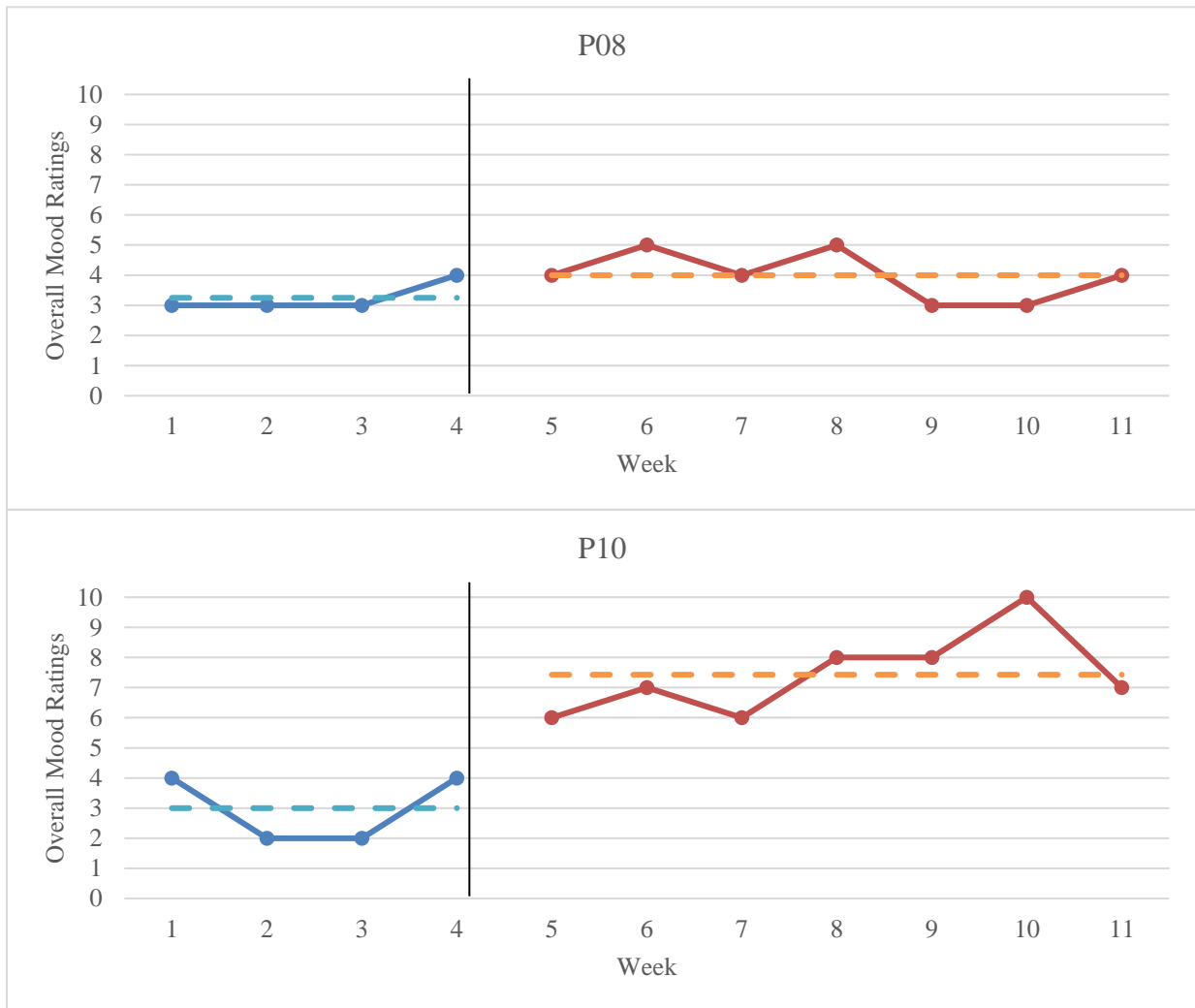
Overall Mood Ratings for Mood-based Participants Across Study Phases

3-Week Baselines



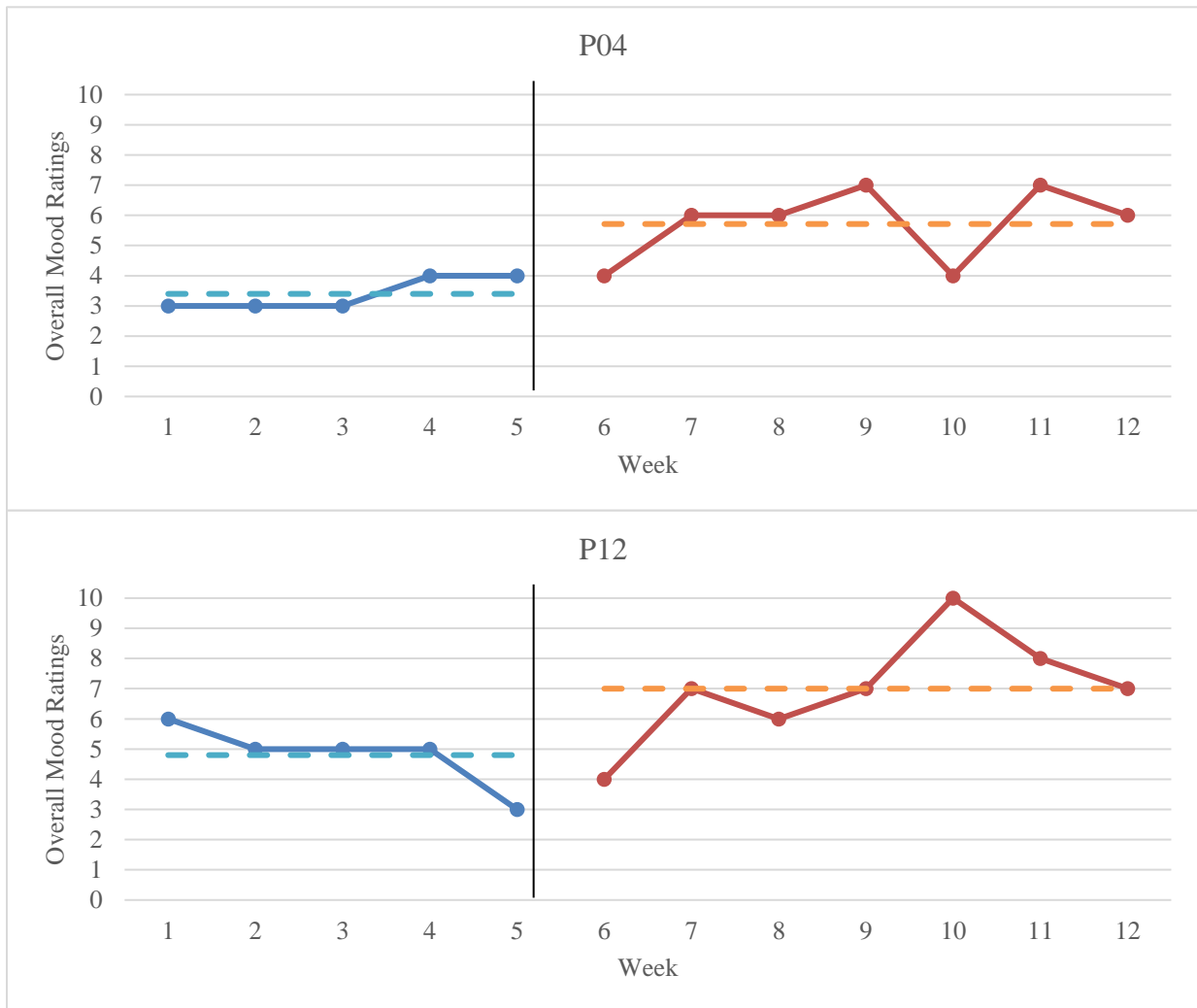
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

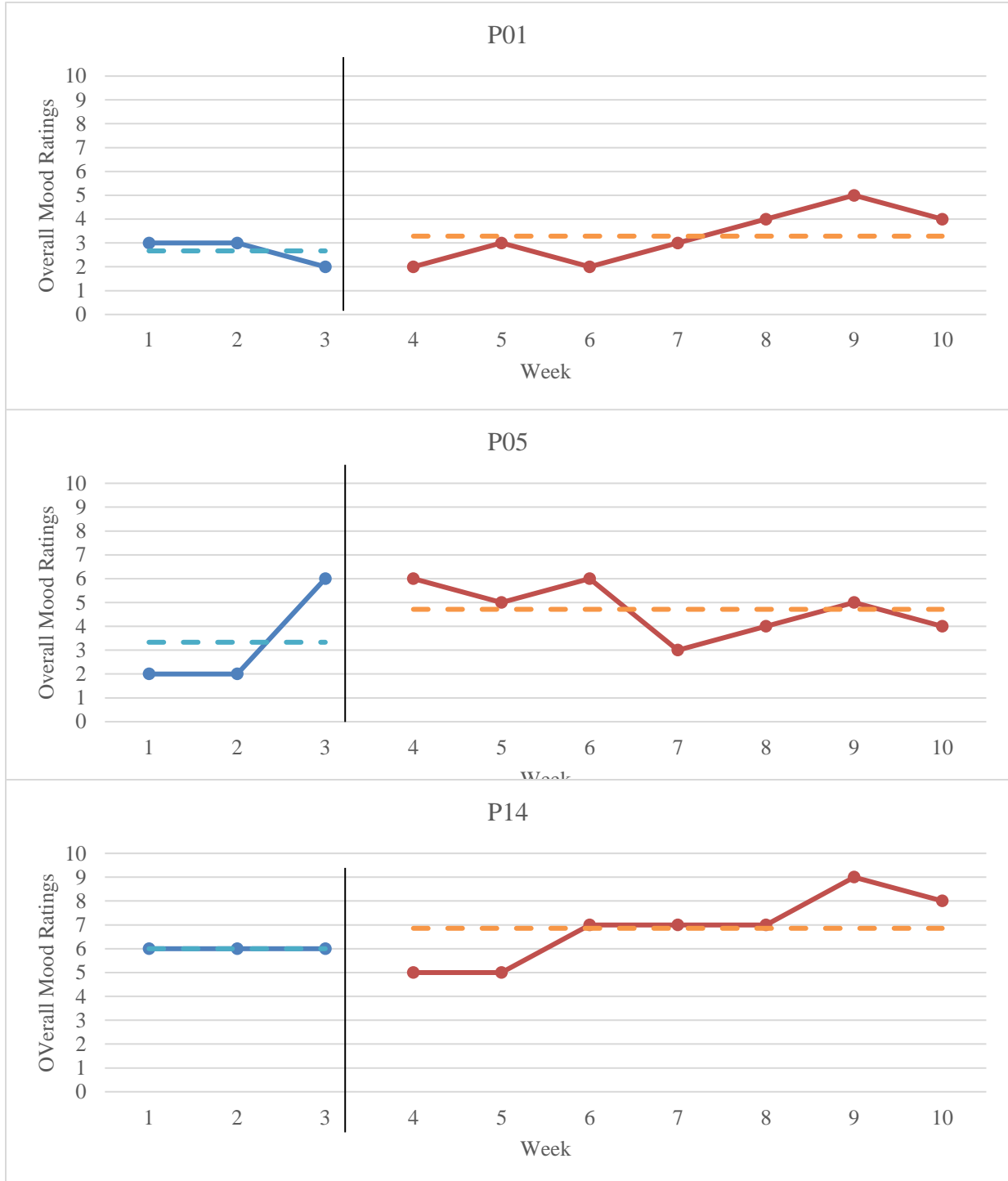


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 14

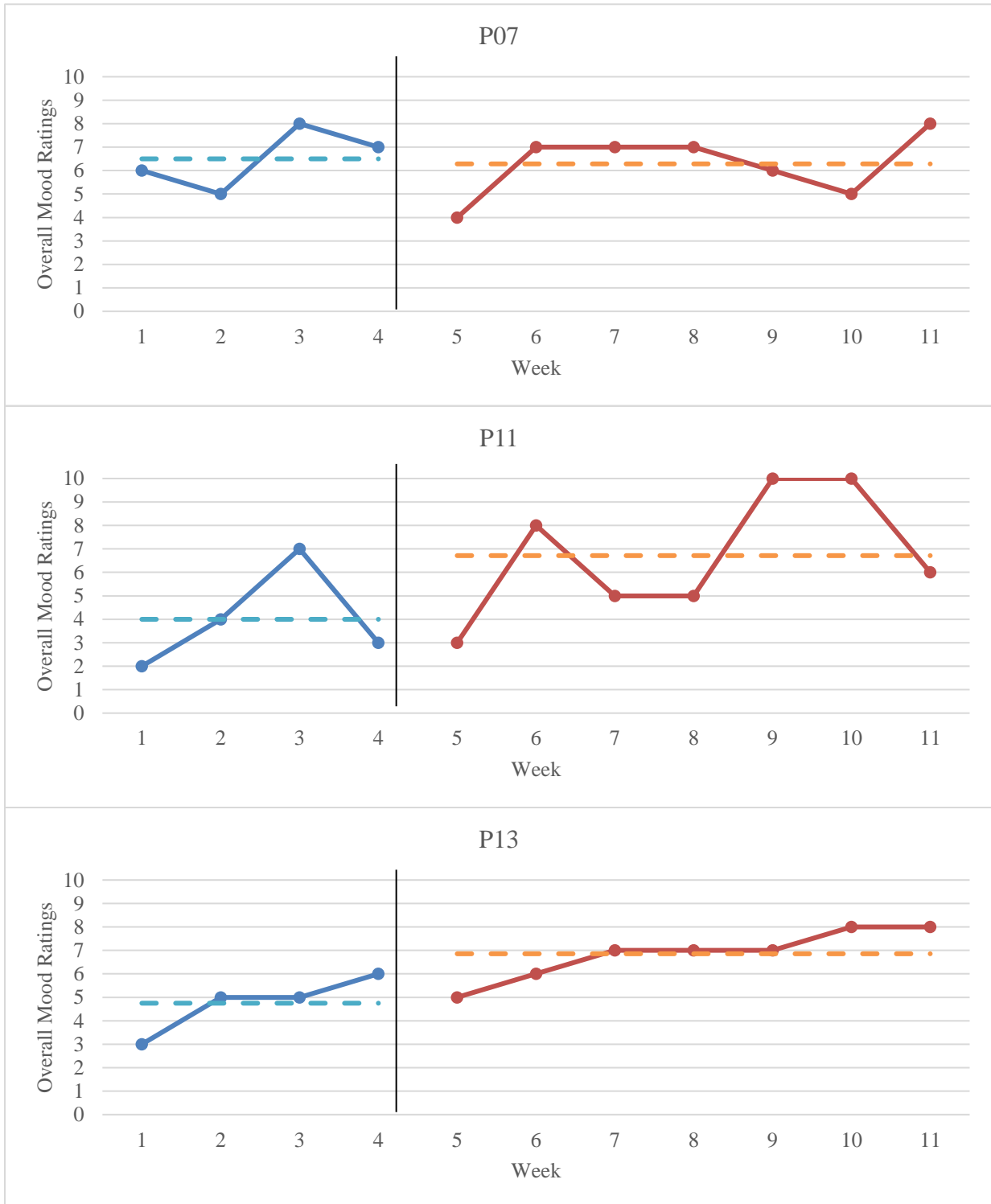
Overall Mood Ratings for Value-based Participants Across Study Phases

3-Week Baselines



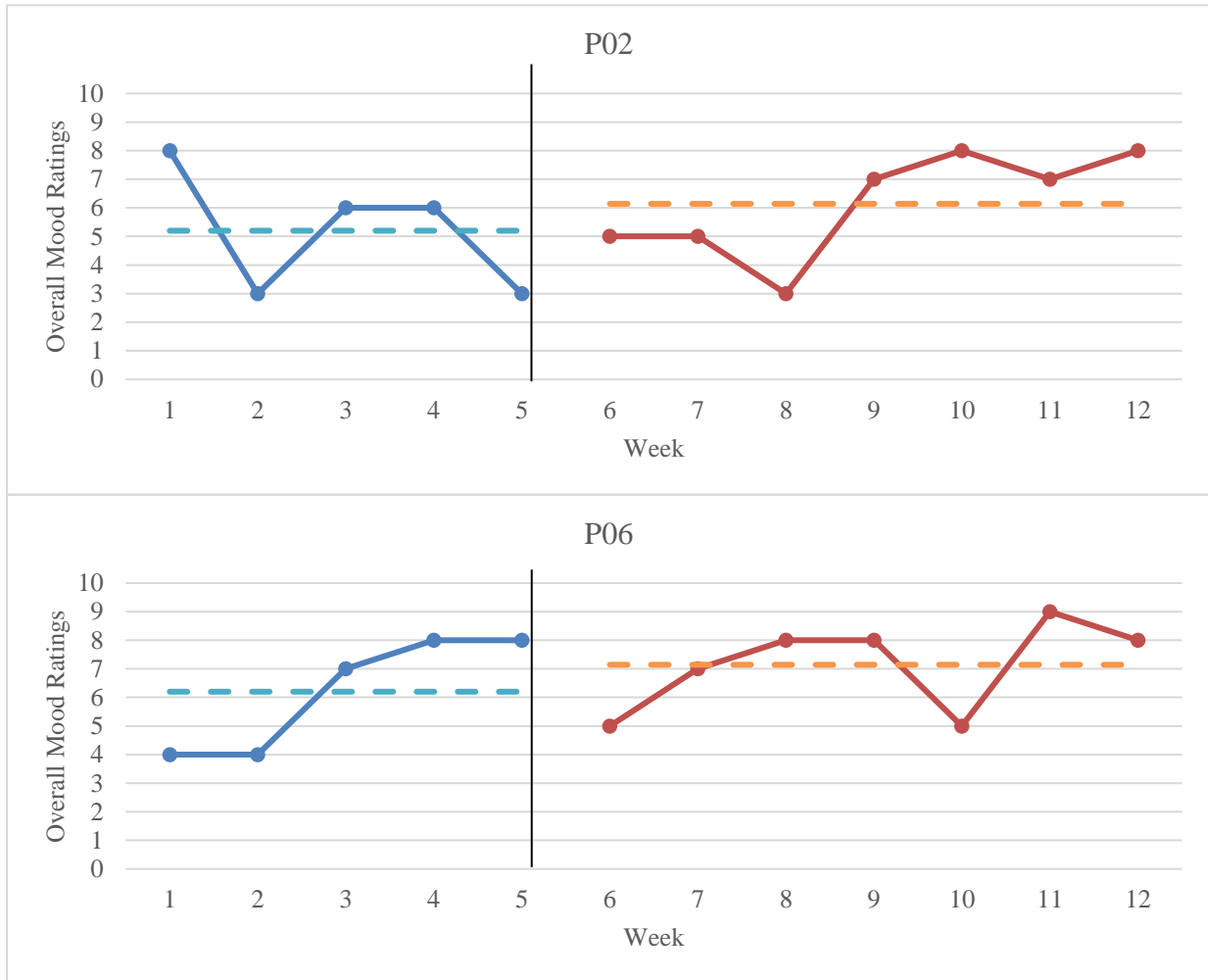
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

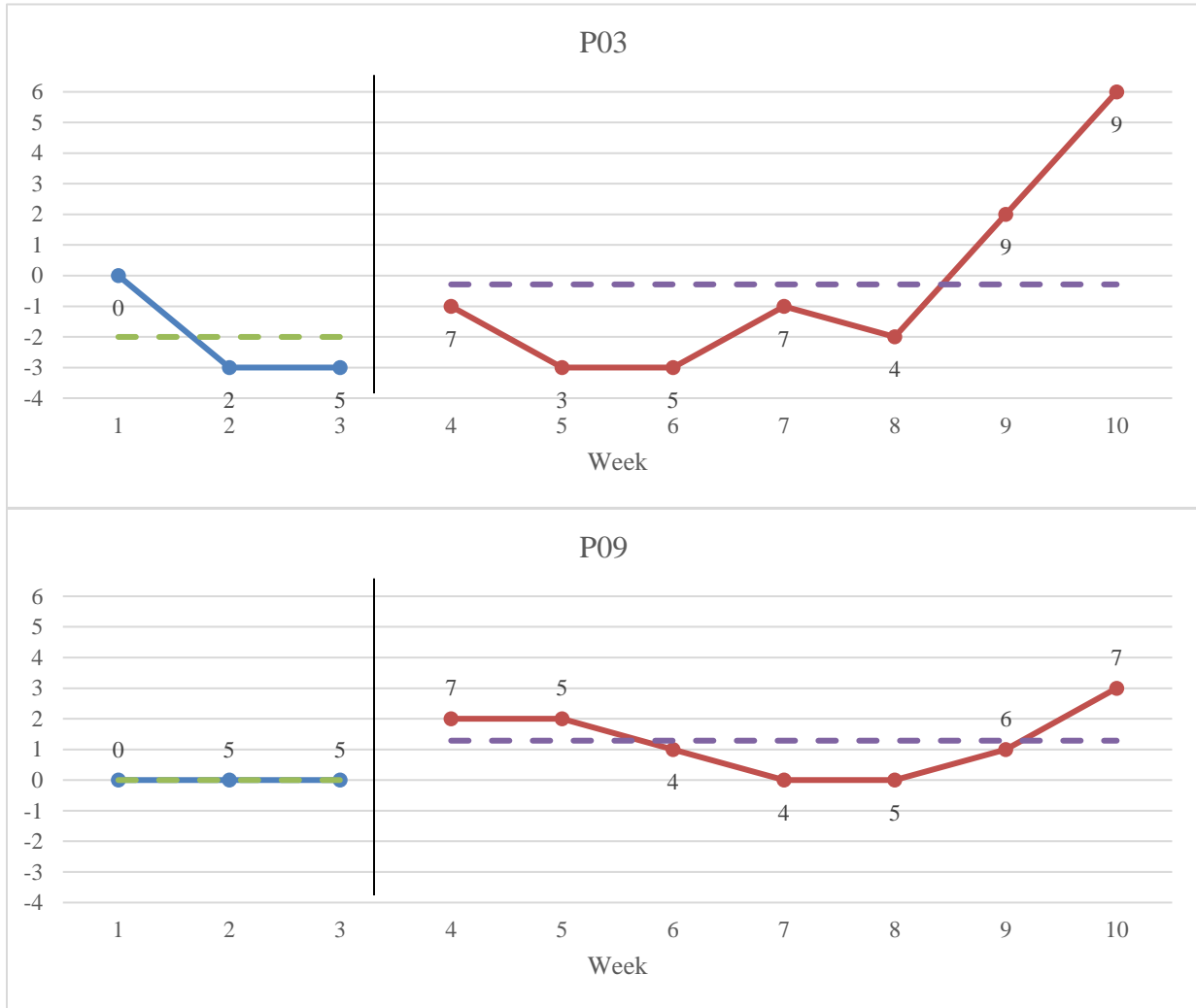


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 15

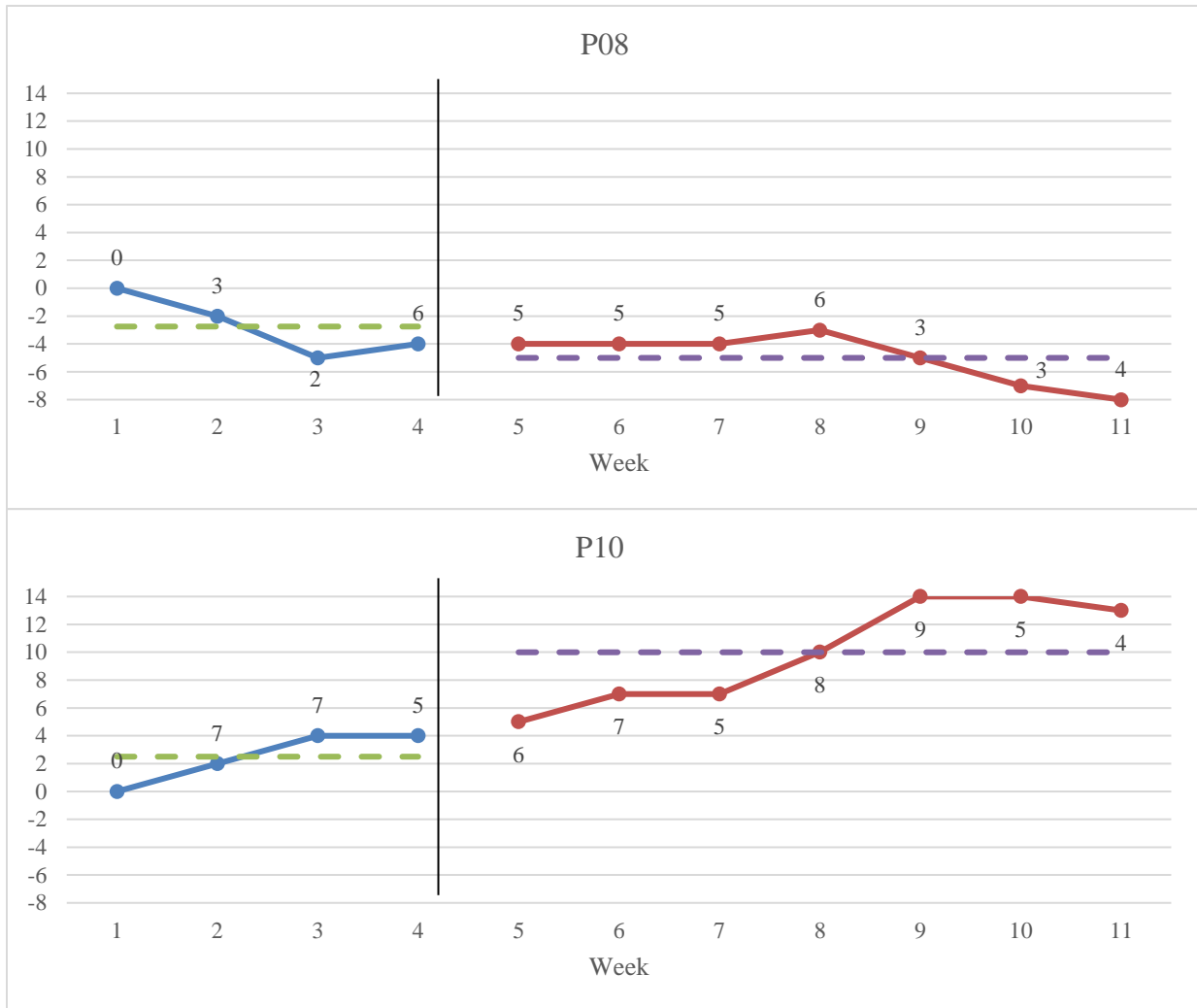
Activity Level Ratings for Mood-based Participants Across Study Phases

3-Week Baselines



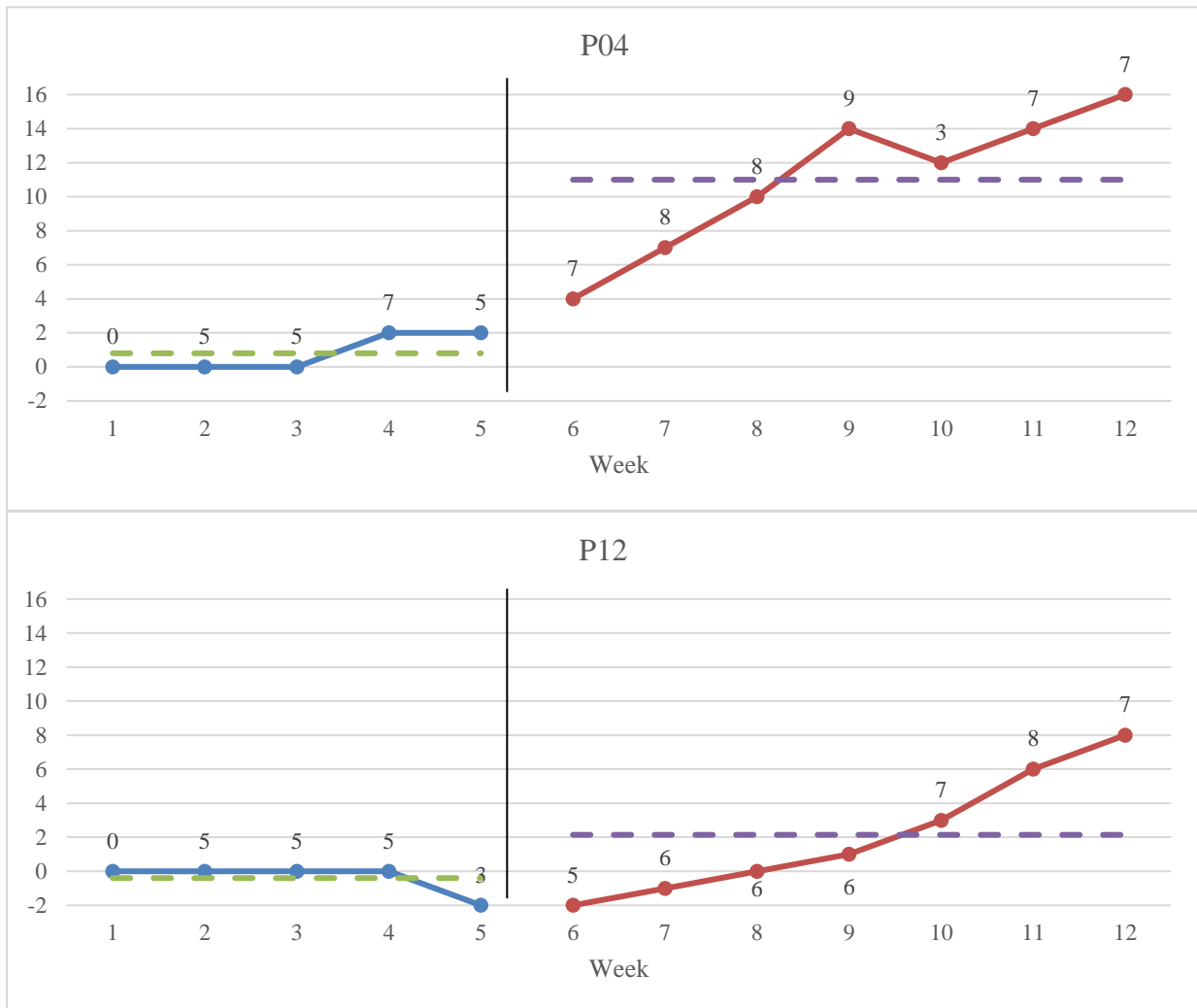
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

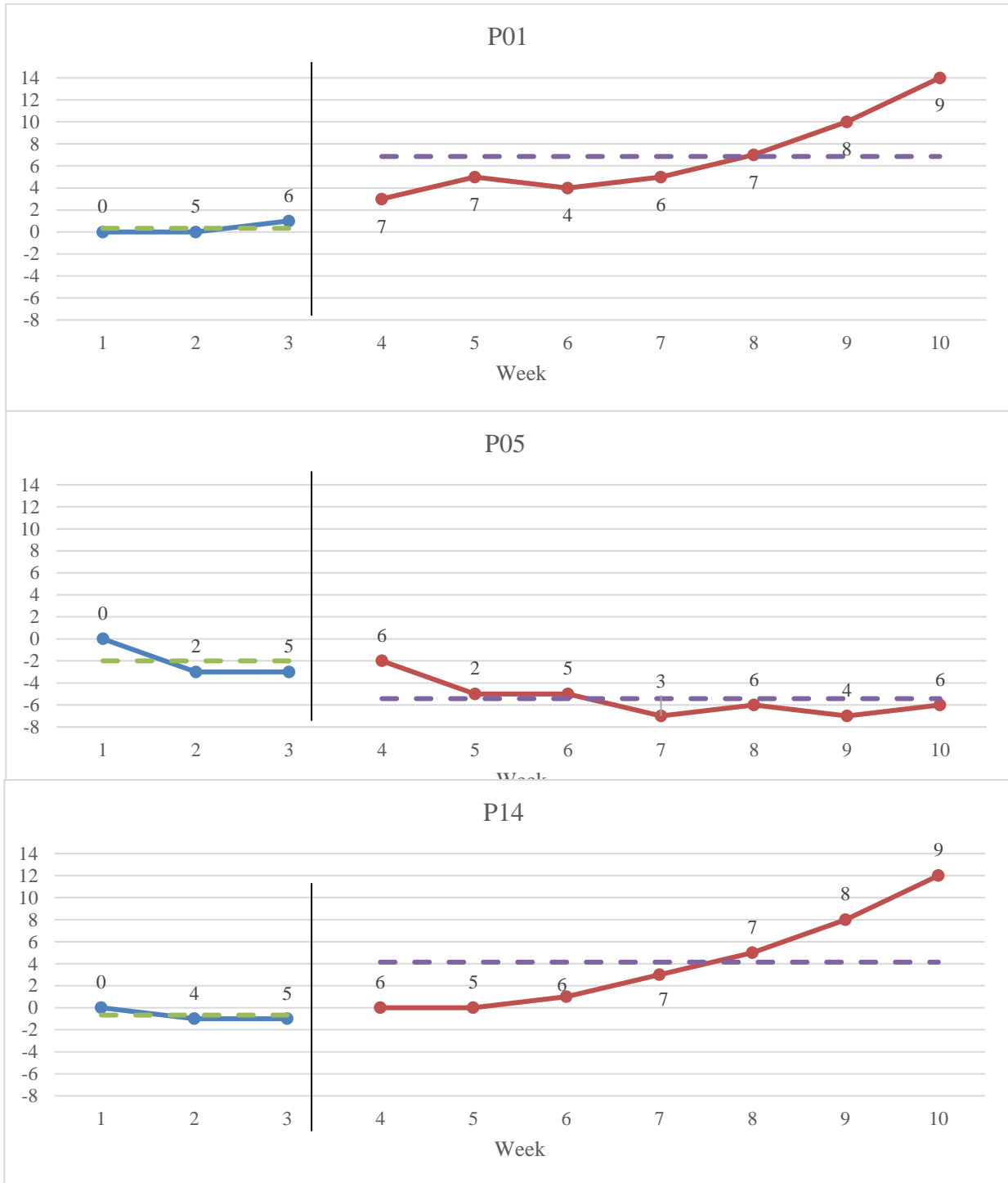


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 16

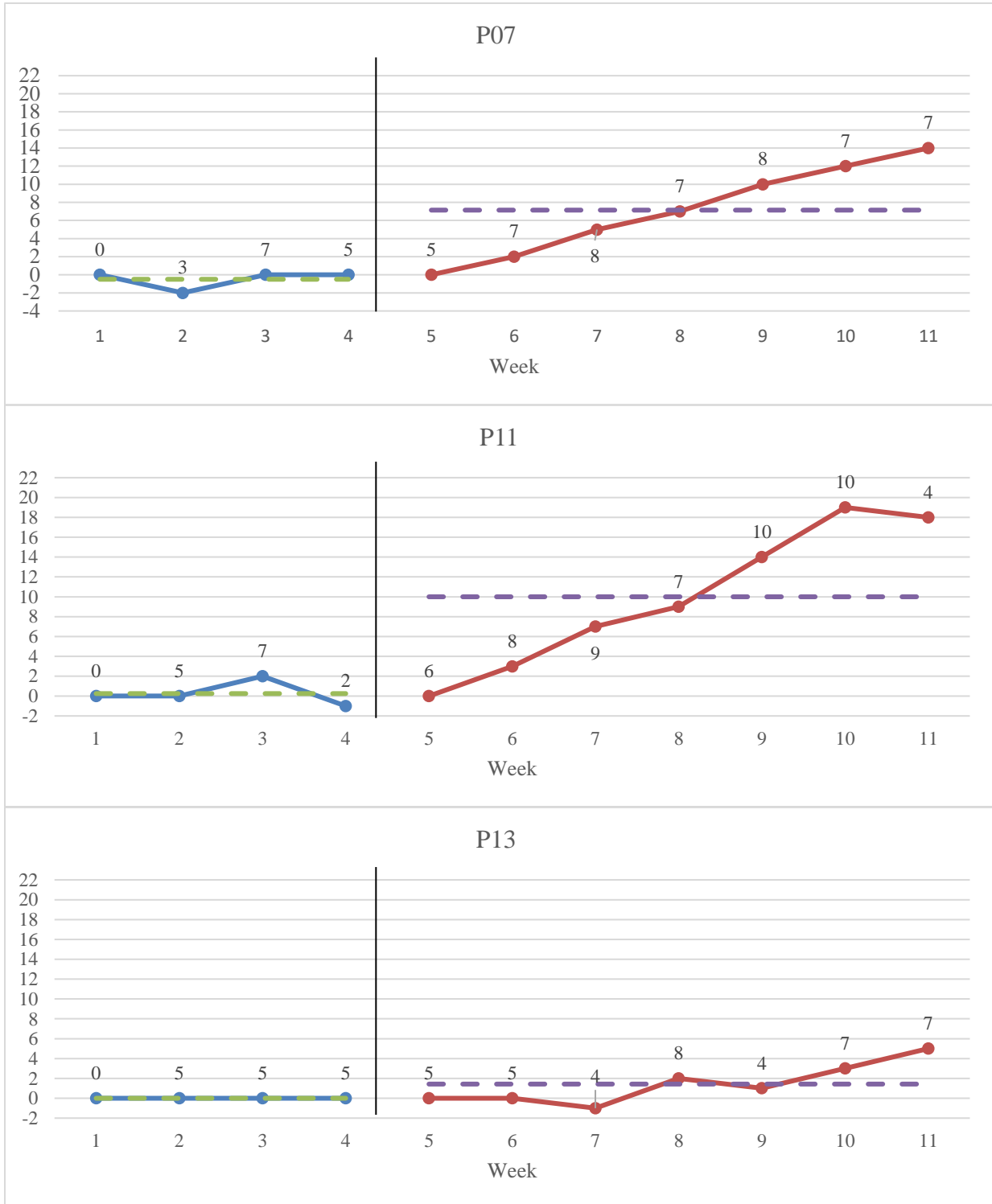
Activity Level Ratings for Value-based Participants Across Study Phases

3-Week Baselines



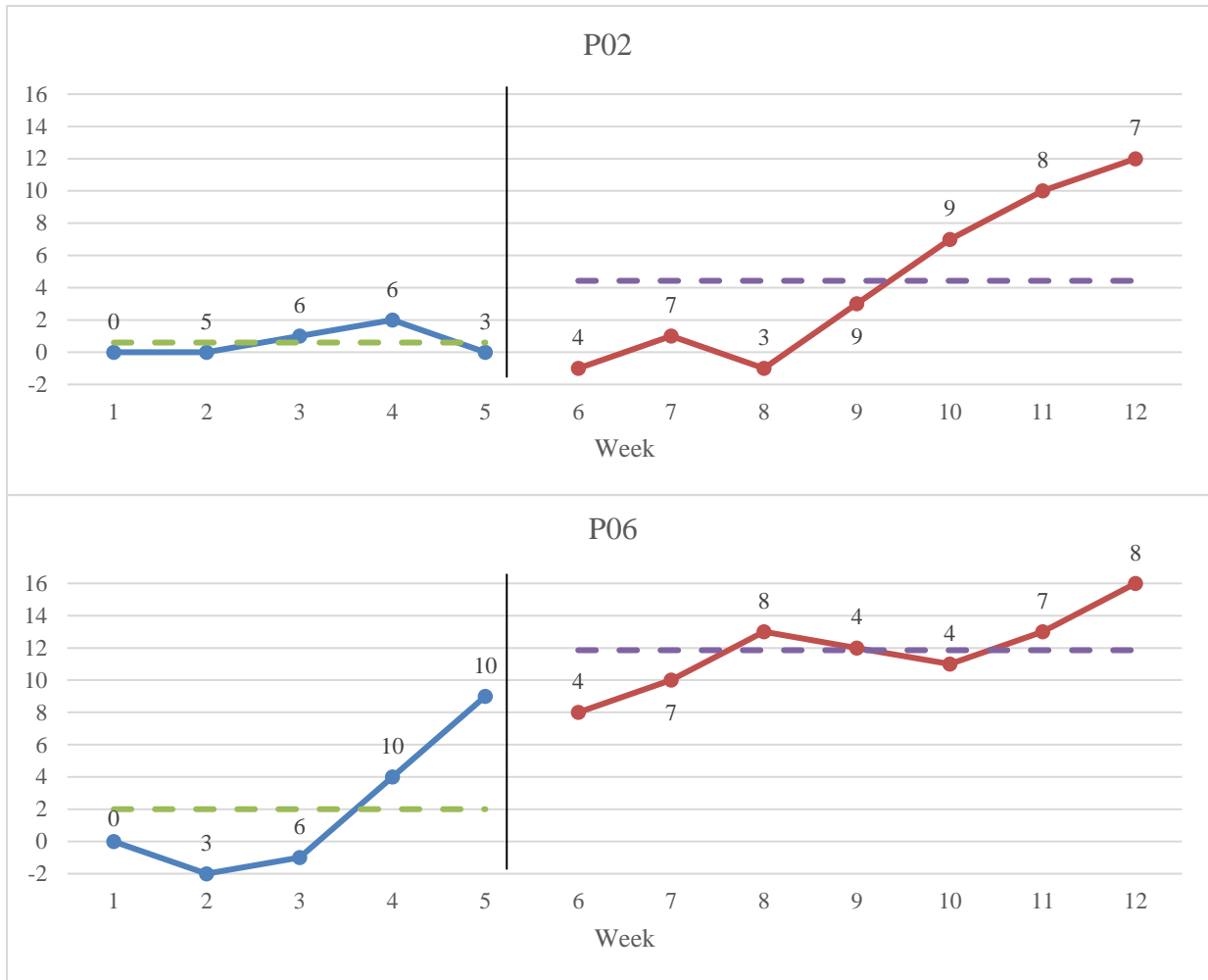
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

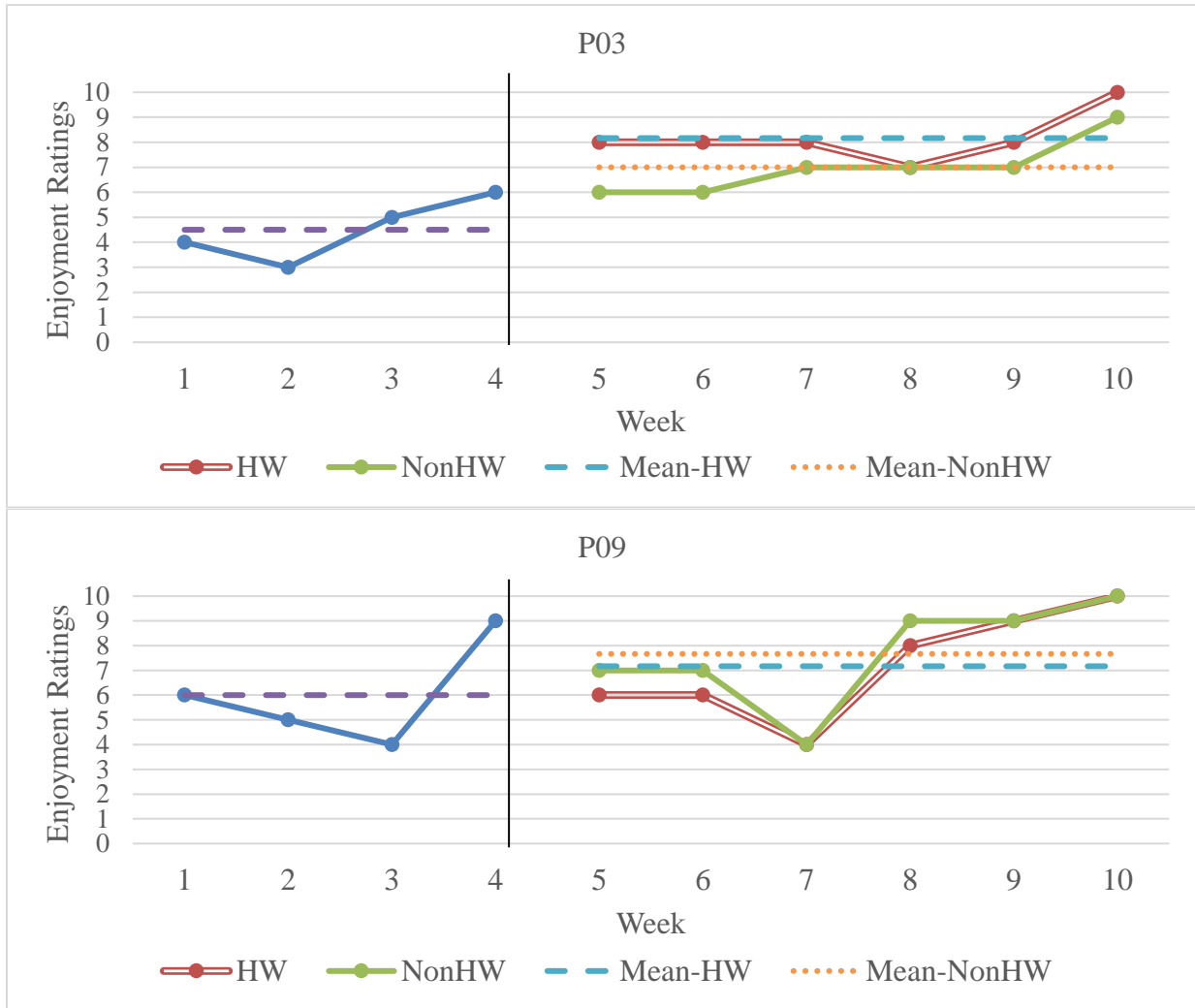


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 17

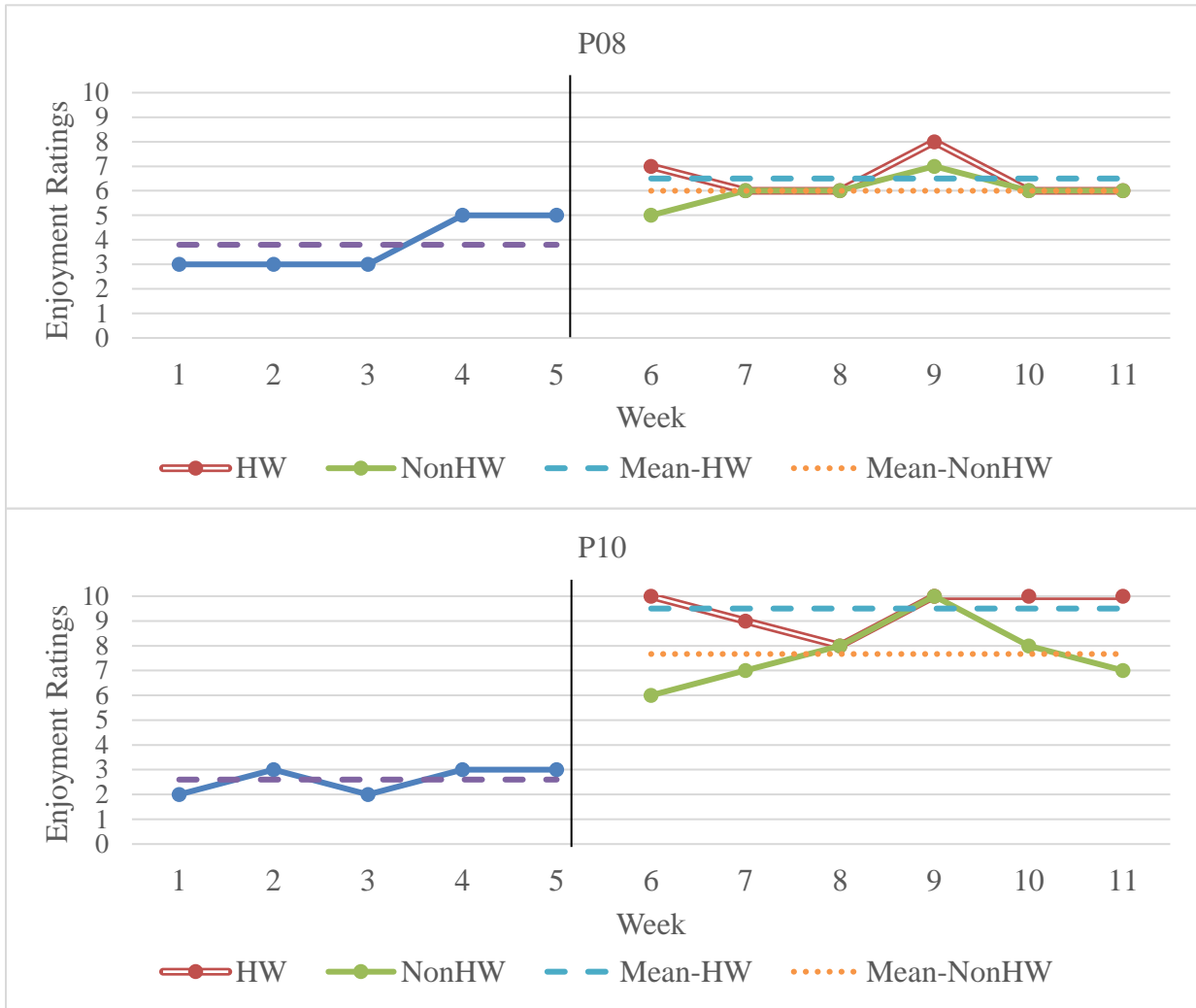
Enjoyment Ratings for Mood-based Participants Across Study Phases

3-Week Baselines



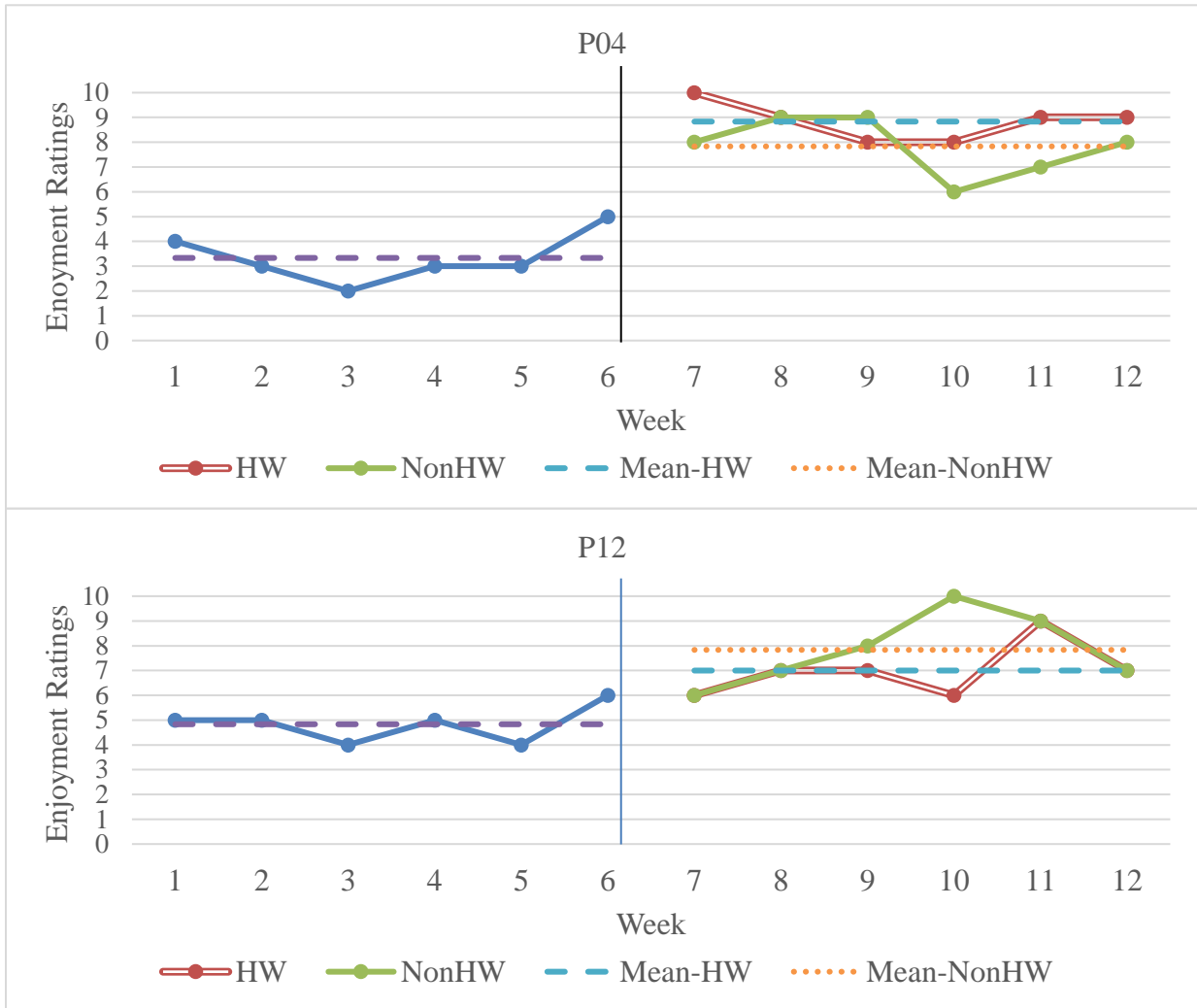
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

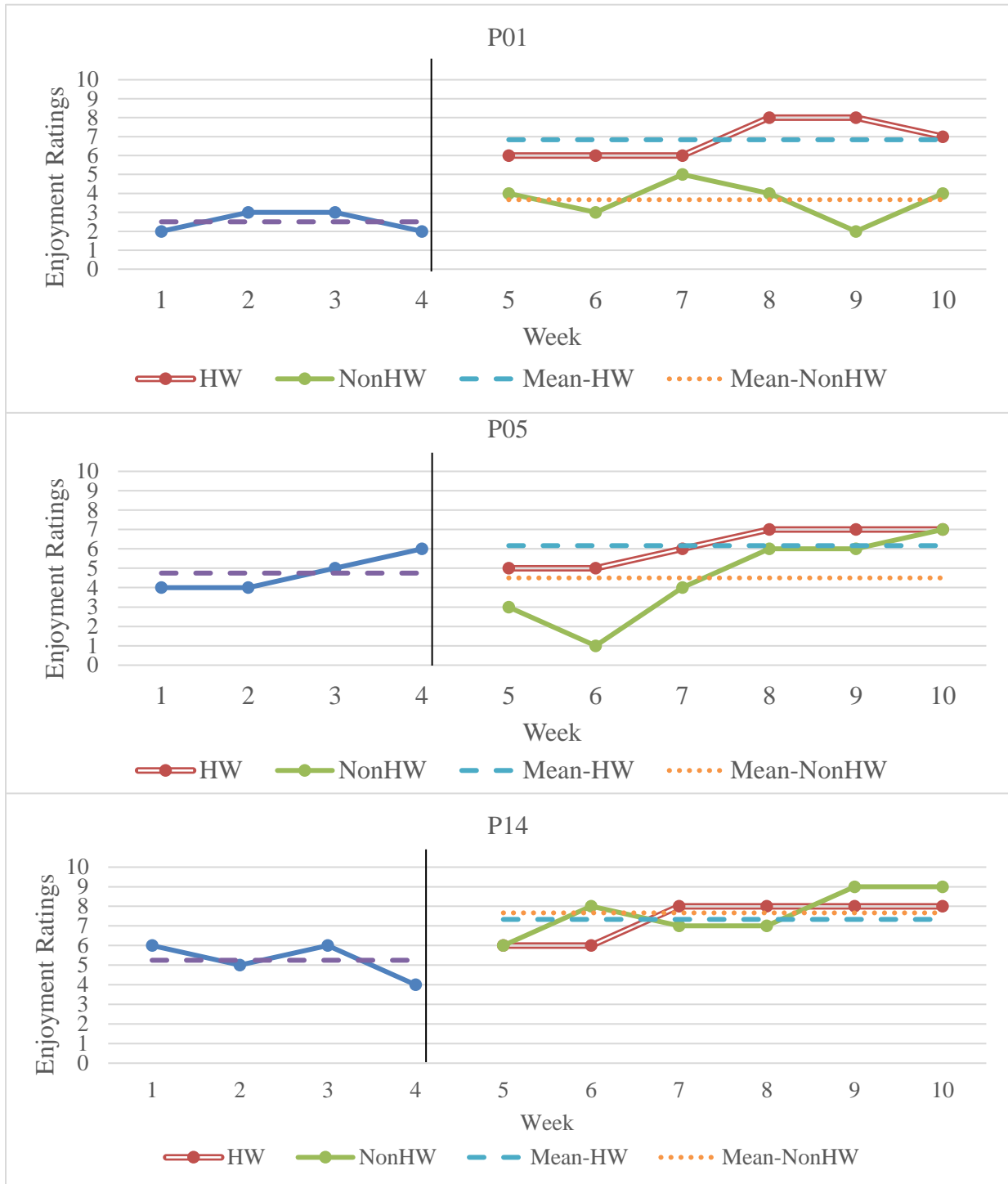


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 18

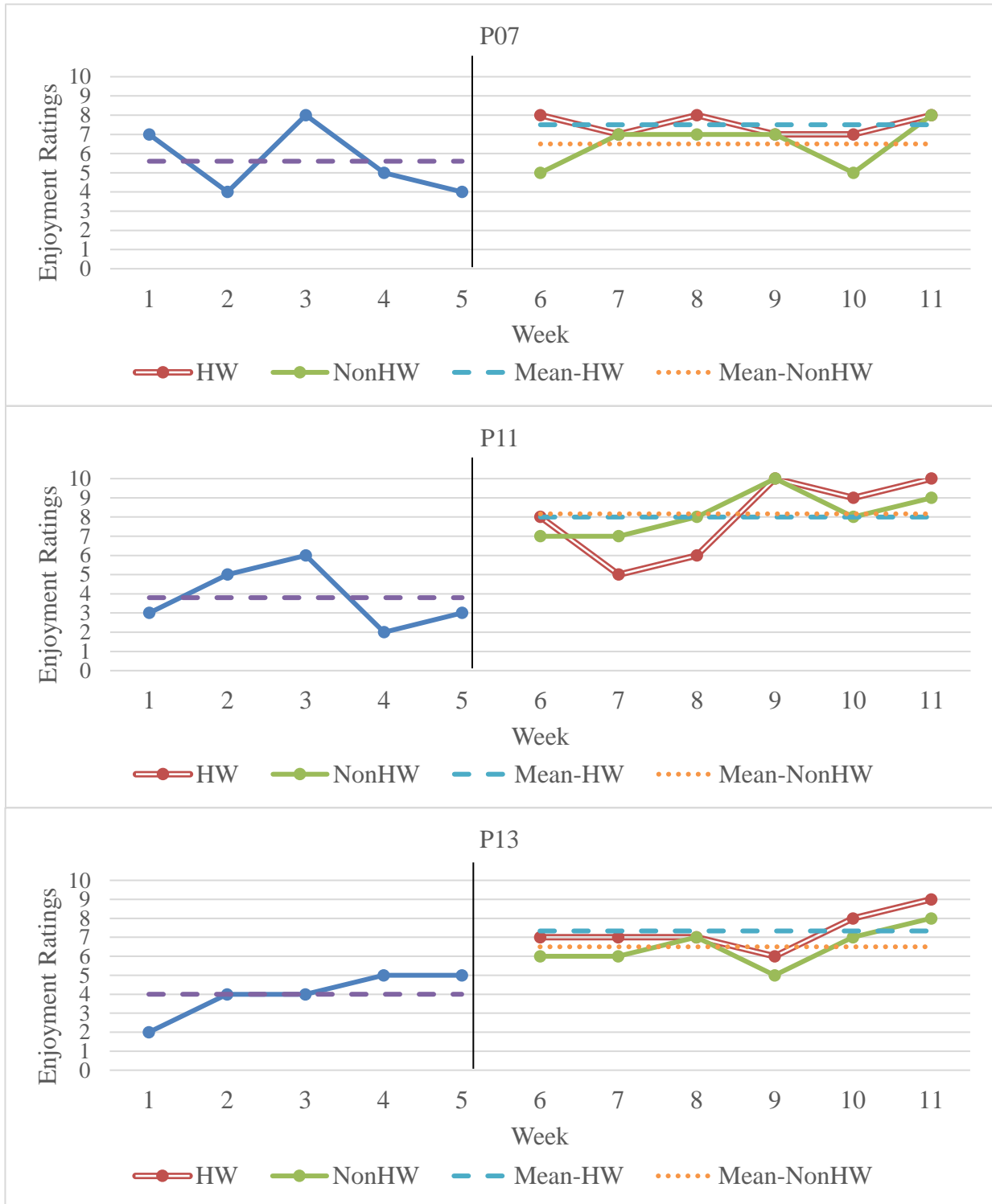
Enjoyment Ratings for Value-based Participants Across Study Phases

3-Week Baselines



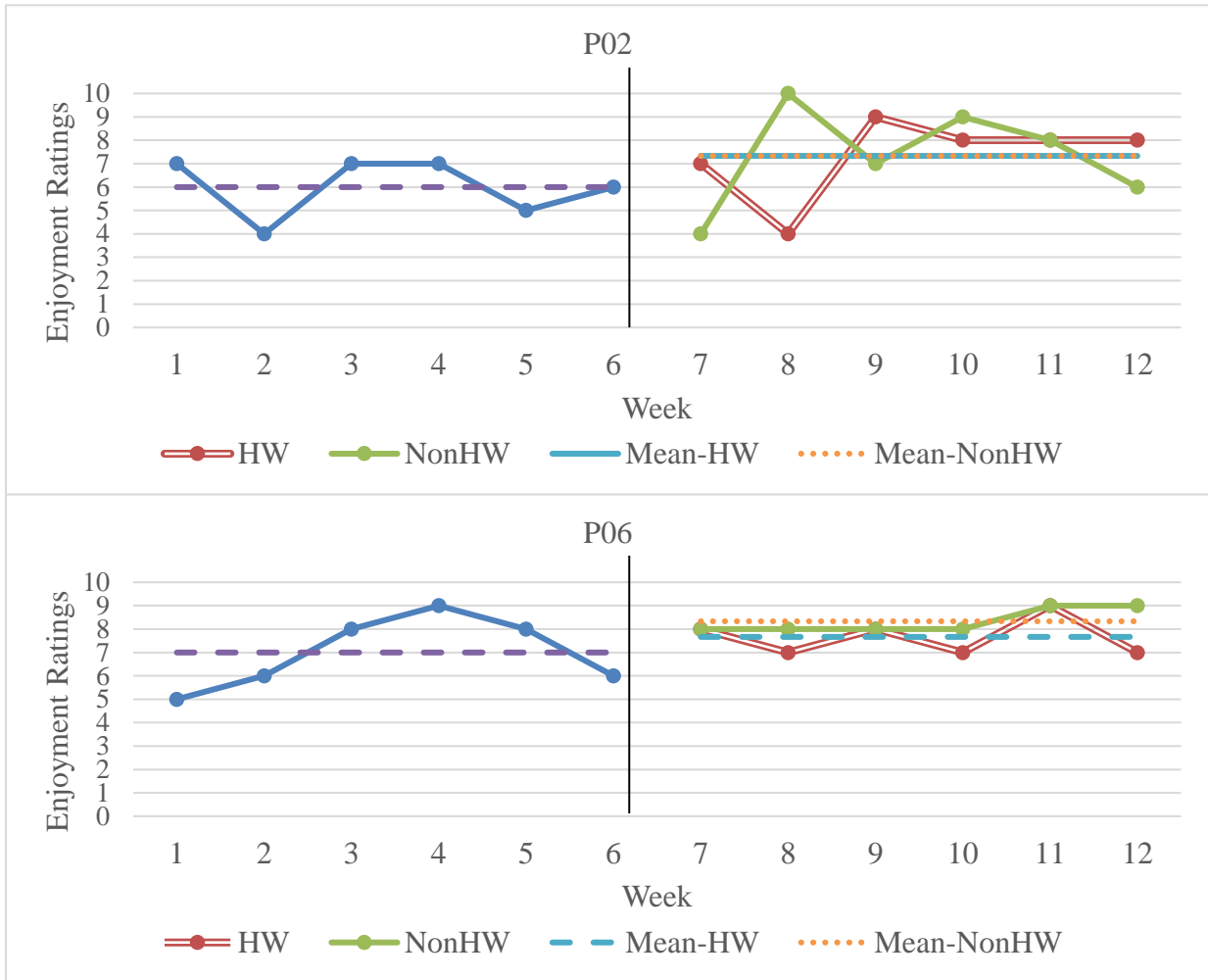
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-Week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-Week Baselines

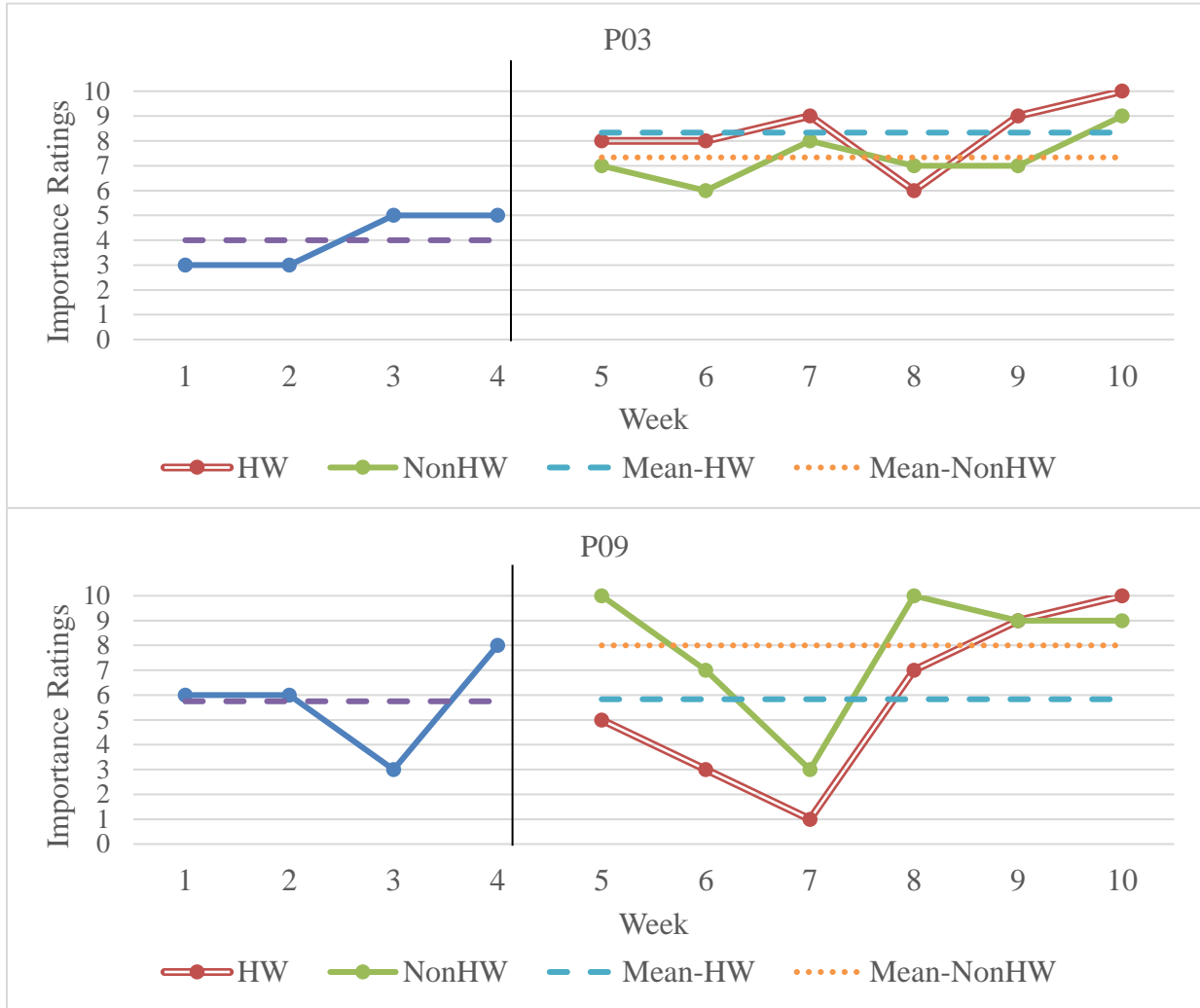


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 19

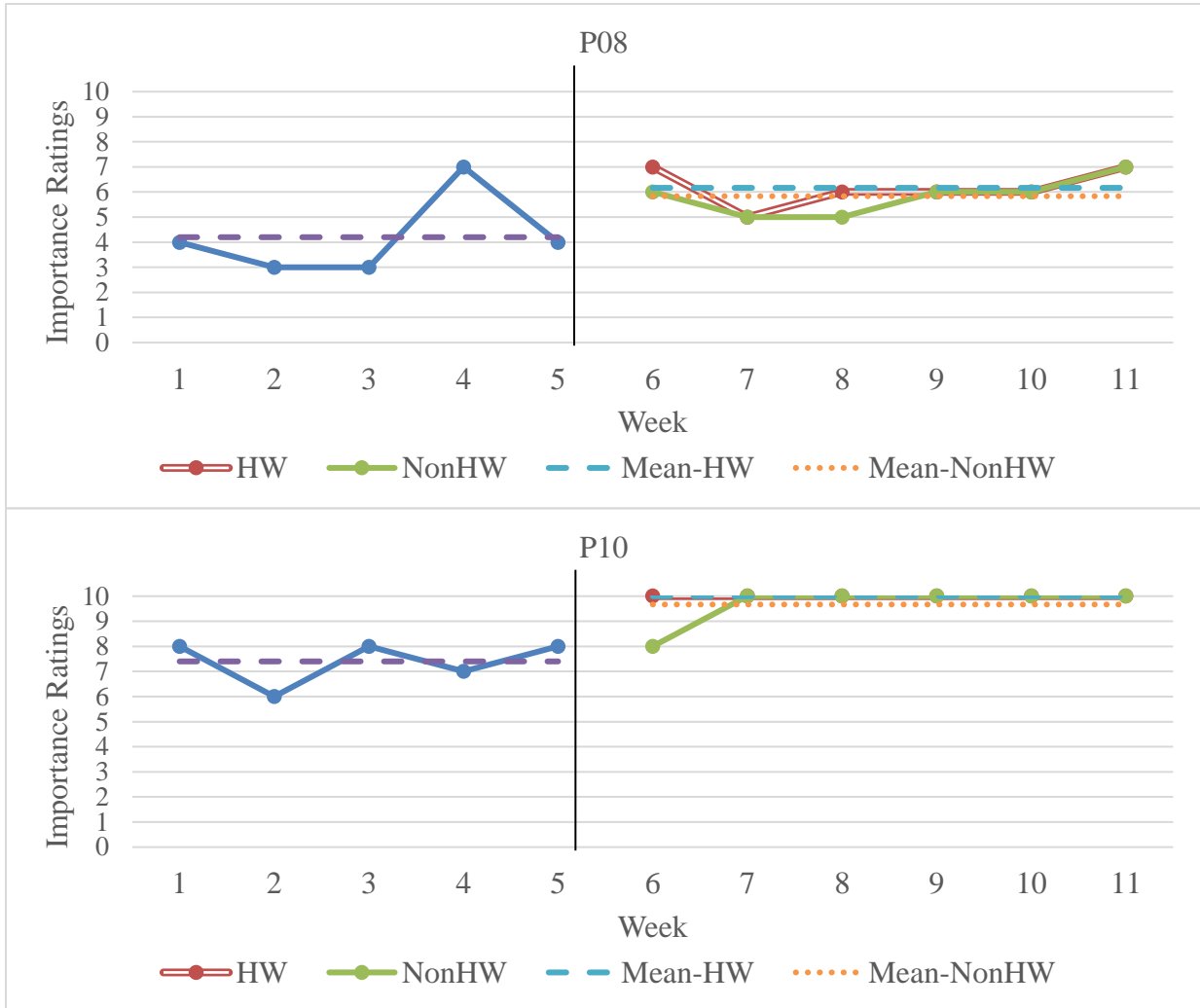
Importance Ratings for Mood-based Participants Across Study Phases

3-week Baselines



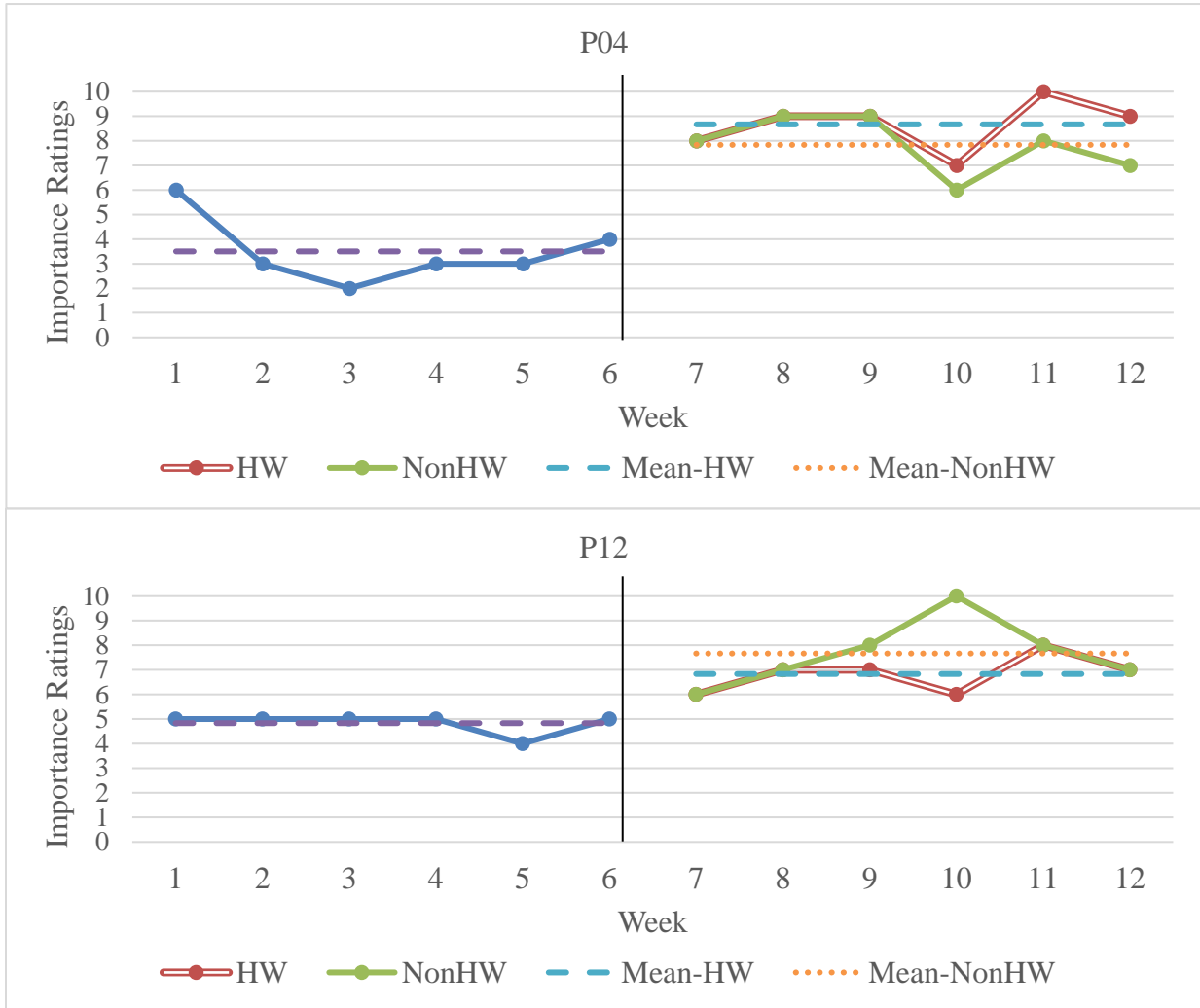
COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-week Baselines

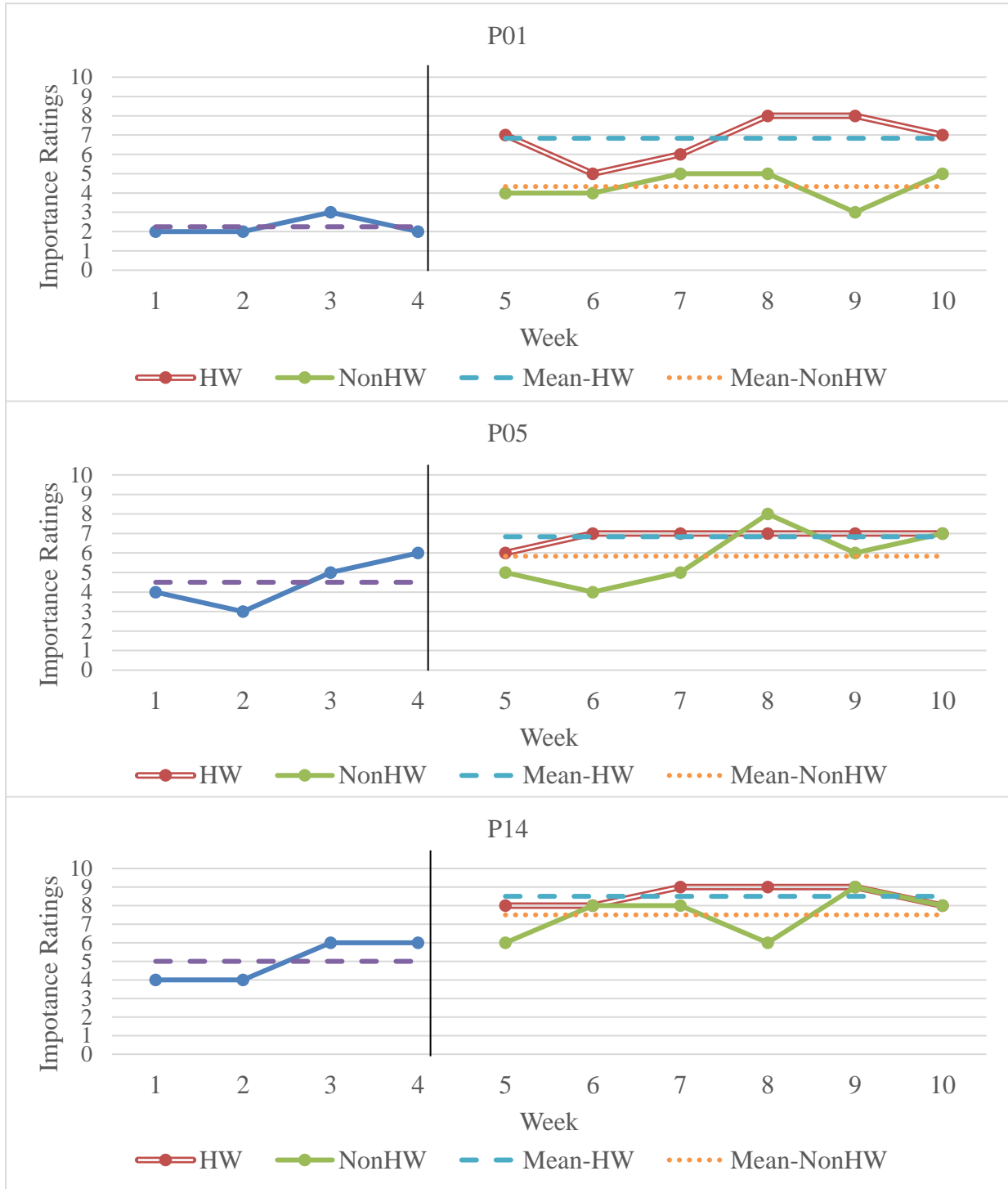


COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

Figure 20

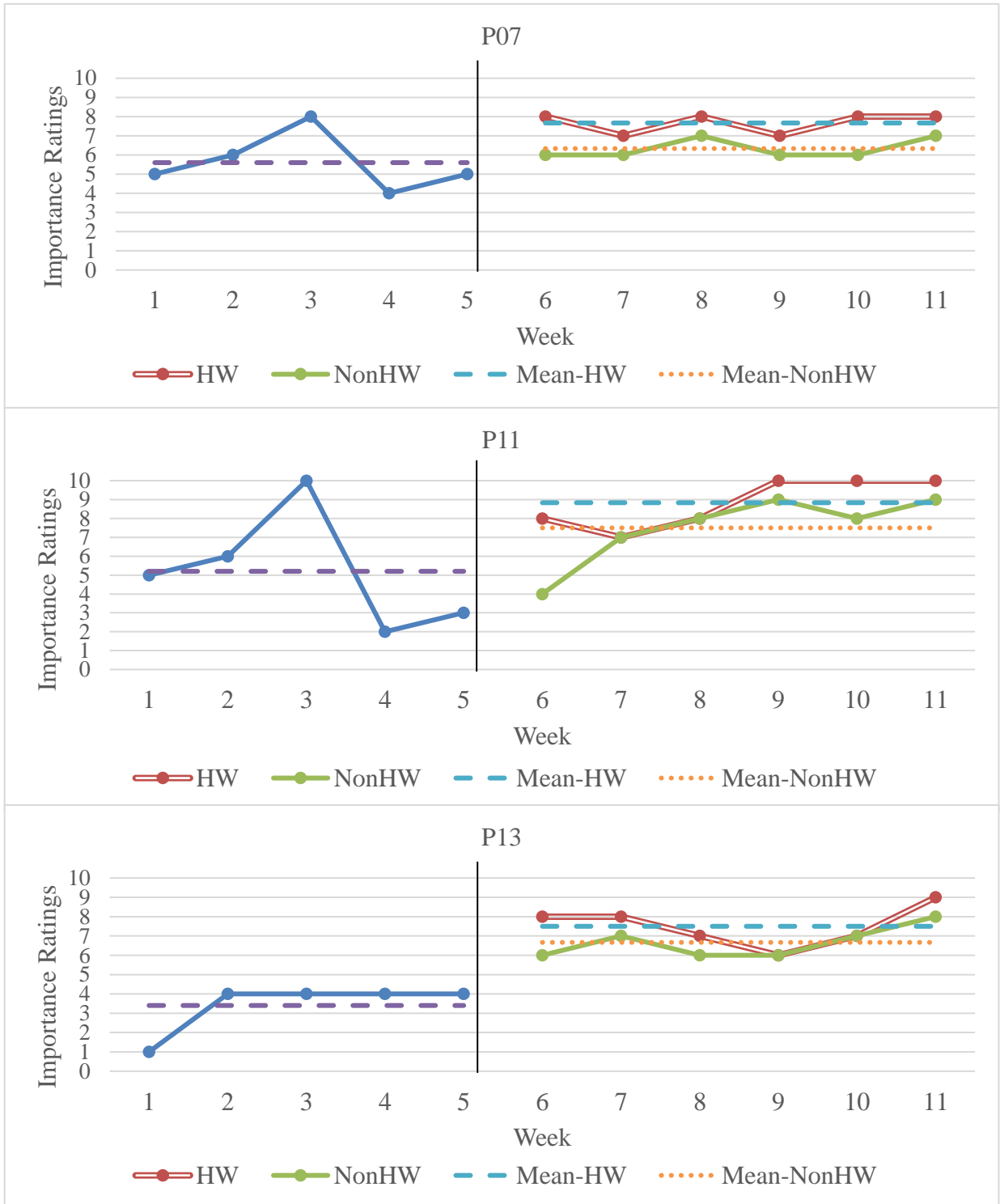
Importance Ratings for Value-based Participants Across Study Phases

3-week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

4-week Baselines



COMPARING BEHAVIORAL ACTIVATION PROTOCOLS

5-week Baselines

