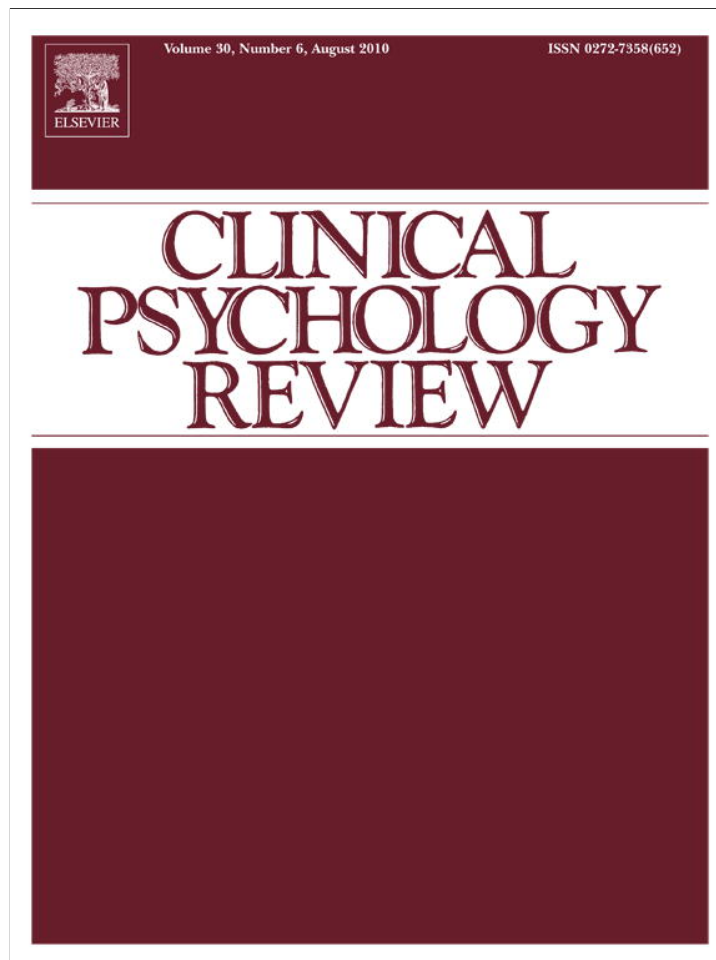


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What is behavioral activation? A review of the empirical literature

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ABSTRACT

Behavioral Activation (BA) for depression is an empirically supported psychotherapy with a long history dating back to the 1970s. To date there have been no systematic reviews of how BA treatment packages and their accompanying components have evolved over the years. This review sought to identify and describe the specific treatment components of BA based on the descriptions of techniques provided in empirical articles on BA and referenced treatment manuals when available. The following component techniques were identified: activity monitoring, assessment of life goals and values, activity scheduling, skills training, relaxation training, contingency management, procedures targeting verbal behavior, and procedures targeting avoidance. The implementation of these techniques is reviewed, along with their empirical support both as stand-alone components and as components of larger treatment packages. Whereas activity scheduling, relaxation, and skills training interventions have received empirical support on their own, other procedures have shown effectiveness as parts of larger treatment packages. Although BA interventions differed in tools used, activity monitoring and scheduling were shown to be constant components across interventions. Possible directions for the future evolution of BA are discussed.

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1. Introduction

Behavioral activation (BA) treatments for depression have a long history, spanning from early pleasant events scheduling of Lewinsohn (1974), to several treatments developed in the 1970s, to BA as a

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component of Cognitive Therapy (CT; Beck, Rush, Shaw, & Emery, 1979), to more contemporary approaches of Martell, Addis and Jacobson (2001) and Lejuez, Hopko, and Hopko (2001). Several recent meta-analyses (Cuijpers, van Straten, & Warmerdam, 2007; Ekers, Richards, & Gilbody, 2008; Mazzucchelli, Kane & Rees, 2009) have comprehensively documented the efficacy of BA treatments. In fact, Mazzucchelli et al. evaluated BA's empirical support in light of standards developed by the American Psychological Association's Division 12 Task Force on Promotion and Dissemination of Psychological Procedures (Chambless et al., 1998; Task Force on Promotion and Dissemination of Psychological Procedures, 1995) and concluded that BA should be designated a "well-established empirically validated treatment."

The specific treatment components of current versions of BA and guidelines for their implementation are available in several manuals, primarily Martell et al. (2001) and Lejuez, Hopko, and Hopko (2001); also see Addis & Martell, 2004; Hopko & Lejuez, 2007; Lejuez, Hopko, Acierno, Daughters, & Pagoto, in press; Martell, Dimidjian, & Herman-Dunn, 2010) and the principles underlying these two interventions also have been clearly outlined (Hopko, Lejuez, Ruggiero, & Eifert, 2003). Research on these current versions of BA, while rapidly growing, however comprises only a small subset of the accumulated evidence for BA evaluated in recent meta-analyses (Cuijpers et al., 2007; Ekers et al., 2008; Mazzucchelli et al., 2009); only 6 of the 52 trials reviewed in these meta-analyses incorporated the Martell et al. (2001) or Lejuez, Hopko, and Hopko (2001) manuals. There has yet to appear a comprehensive catalog and description of BA techniques that have been employed over its entire history.

With this extensive history and empirical support, the term "activation" has entered the mainstream clinical psychology lexicon as a component of depression treatment and often the assumption by those without specific training in BA is that activation consists primarily or exclusively of the scheduling of pleasant activities. For example, the American Psychological Association, on the public information pages of its website, notes that one of the four aspects of effective depression treatment is to help clients "gradually incorporate enjoyable, fulfilling activities back into their lives" (the other three aspects briefly describe problem-solving, interpersonal and cognitive approaches; APA, 2009).

Examining BA's diverse history in more detail, it becomes clear that BA has included variants on the theme of scheduling of pleasant activities but is in fact much more than this and a variety of component techniques and strategies have been employed under the umbrella of BA for depression. This review begins with a short history of BA and a summary of its empirical support. Following this history, the empirical studies analyzed in the three published meta-analyses of BA are reviewed to 1) catalog the various BA component techniques, 2) describe their implementation, 3) review the research on them as components of the larger packages, and 4) review the research on them as stand-alone interventions. The intention is to provide readers with a clear overview of exactly what components make up BA and the empirical support for each component. The review ends with suggestions for implementing the full arsenal of BA techniques to maximize the efficacy and efficiency of the general approach and suggestions for future research directions.

2. History of behavioral activation

Lewinsohn (1974) provided the seminal description of the behavioral theory of depression in which depression is a function of 1) low rates of response-contingent positive reinforcement and 2) inadequate social skill. In 1976, he consolidated a number of previous intervention studies based on this theory into a comprehensive treatment manual (Lewinsohn, Biglan, & Zeiss, 1976). This manual primarily encouraged activity scheduling to address environmental deficits in positive reinforcement and social skills training to address

behavioral deficits in the ability to obtain and maintain reinforcement, but also included a number of other behavioral interventions such as contingency management strategies to maximize session attendance and procedures such as thought-stopping to target covert verbal behavior.

Lewinsohn's model and treatment techniques inspired a number of interventions that were empirically evaluated (e.g., Gardner & Oei, 1981; Maldonado-Lopez, 1982; Taylor & Marshall, 1977; Wilson, 1982; Wilson, Goldin, & Charbonneau-Powis, 1983), including some variants that demonstrated the treatment's strength in diverse settings, such as a group behavior therapy approach for depressed Latinas (Comas-Díaz, 1981) and a treatment for low-income rural women with depression (Padfield, 1976). These treatments, however, varied considerably with respect to whether they were faithful to the entire set of techniques presented in Lewinsohn et al. (1976) or only included some techniques. While research on Lewinsohn's approach was accumulating, others were developing interventions based on alternative behavioral models. McLean (1976) developed a variant that emphasized training in a variety of behavioral, interpersonal and cognitive skills which outperformed a non-specific therapy and medication in a randomized trial (McLean & Hakstian, 1979). Rehm (1977) developed self-control therapy, which was consistent with Lewinsohn's interventions in many ways but also included techniques derived from Kanfer's (1970) behavioral model of self-control, including cognitive techniques.

Collectively all of the treatments included in these studies have been labeled activity scheduling or BA treatments by various reviewers (e.g., Cuijpers et al., 2007; Ekers et al., 2008; Mazzucchelli et al., 2009). These meta-analyses evaluated the effectiveness of these treatment packages as a group and found that they performed quite well in randomized trials, better than wait-list and no-treatment controls and—despite singular but influential results such as Shaw (1977)—equivalent to CT across acute treatment and follow-up periods (Cuijpers et al., 2007; Ekers et al., 2008; Mazzucchelli et al., 2009).

Despite this empirical support, in line with the zeitgeist of the late 1970s and early 1980s, behavioral treatment packages fell out of favor. Two studies of Lewinsohn's approach were noteworthy with respect to this fall. First, Shaw (1977) published a small but influential comparison that suggested the superiority of cognitive techniques over behavioral techniques. Second, Lewinsohn and his students completed an influential component analysis that demonstrated no differential effectiveness between activity scheduling, skills training, and cognitive techniques (Zeiss, Lewinsohn, & Muñoz, 1979), leading Lewinsohn himself to integrate the components into a cognitive-behavioral rather than purely behavioral approach (Lewinsohn, Muñoz, Youngren, & Zeiss, 1986).

The primary cognitive-behavioral approach to replace traditional behavioral approaches in popularity was, of course, CT by Beck et al. (1979). CT emphasized cognitive restructuring techniques but included a chapter on behavioral techniques that detailed activity monitoring and scheduling interventions focused on both increasing feelings of mastery and pleasure, and social skills training, all framed within a cognitive change model. CT became the most widely researched and employed of the empirically supported treatments for depression (DeRubeis & Crits-Christoph, 1998). While the hegemony of the cognitive model remained undisputed for many years, research on behavioral treatments continued, including continued research on self-control therapy (Rehm et al., 1981; Rehm, Kaslow, Rabin, 1987; Rokke, Tomhave, & Jovic, 1999) and a variant of BA modified for depressed elderly individuals (Gallagher, Thompson, Baffa, Piatt, Ringerling, & Stone, 1981; Gallagher & Thompson, 1982; Thompson & Gallagher, 1984; Thompson, Gallagher, & Breckenridge, 1987).

Jacobson et al. (1996) renewed emphasis on behavioral techniques with a component analysis of CT that, like Zeiss et al. (1979), found no

evidence for differential effectiveness of behavioral versus cognitive techniques. Unlike Zeiss et al., however, Jacobson et al. employed an additive design in which cognitive techniques were added to behavioral techniques, allowing for the conclusion that adding cognitive techniques to BA does nothing to improve outcomes at the end of acute treatment and a two-year follow-up (Gortner, Gollan, Dobson & Jacobson, 1998). This led Jacobson to conclude that BA techniques were superior on the grounds of equal efficacy but improved efficiency and ease of training.

Because the BA condition in Jacobson et al. (1996) was little more than the behavioral component of CT, Jacobson and colleagues wanted to create a proper behavioral approach, restoring and updating the behavioral theory of depression and articulating a full treatment model (Jacobson, Martell, & Dimidjian, 2001). The new model developed (Martell et al., 2001) expanded Lewinsohn's theory by adopting a functional contextualistic perspective (Hayes, Strosahl, & Wilson, 1999) on depression, employed basic activity scheduling to overcome deficits in positive reinforcement, and emphasized the need to block avoidance behavior and activate competing behavior in the face of avoidance contingencies (Ferster, 1973). This approach to BA also included some skills training suggestions, contingency management, and allowed for some discussion of cognitive variables such as rumination with linked techniques targeting rumination. The authors emphasized the flexible, idiographic application of techniques rather than a structured, session-by-session format.

Dimidjian et al. (2006) compared this version of BA to CT, Paroxetine and a medication placebo in a large randomized trial and results were encouraging for BA. Whereas all treatments performed similarly for mildly depressed clients, BA and Paroxetine outperformed CT for moderate-to-severe depression, and BA evidenced a lower drop-out rate than Paroxetine. The superiority of BA over CT for more severely depressed clients appeared robust across several analytic strategies (Coffman, Martell, Dimidjian, Gallop, & Hollon, 2007). Furthermore, when treatment responders were followed for 2 years, BA performed equivalently well to CT and Paroxetine over follow-up, and better than clients discontinued from medication treatment (Dobson et al., 2008).

Several smaller trials of this version of BA have been supportive, including a group BA compared to a wait-list control in a public mental health setting (Porter, Spates, & Smitham, 2004), and uncontrolled trials of BA for post-traumatic stress disorder symptoms in a veteran sample (Jakupcak et al. 2006), depressed Latinas (Kanter et al., 2010), and obese, depressed clients (Pagoto, Bodenlos, Schneider & Spates, 2008).

Also in response to the component analysis of CT by Jacobson et al. (1996), Lejuez, Hopko and Hopko (2001) independently developed a brief BA treatment for depression (BATD) that employed activity scheduling and other behavioral techniques within a framework that applied matching law (Hernstein, 1970) to understand depression. In this view, depression is a function of both increased reinforcement for depressive behaviors (e.g., staying in bed, crying, stating feelings of depression or sadness) and decreased reinforcement for non-depressive, healthy behaviors. BATD therefore aims to change this ratio in favor of greater non-depressive behaviors with a structured protocol incorporating activity monitoring, values assessment, activity scheduling and some contingency management procedures. For a theoretical comparison of BA and BATD, see Hopko, Lejuez, Ruggiero, and Eifert (2003). Lejuez et al. (in press) have recently updated the BATD manual.

Several trials of BATD have also been supportive, including a randomized trial on an inpatient unit (Hopko, Lejuez, LePage, Hopko & McNeil, 2003), a randomized trial of BATD and smoking cessation techniques for smokers with elevated depressive symptoms (MacPherson et al., 2010), a trial of BATD with inner-city illicit drug users with elevated depressive symptoms (Daughters et al. 2008), and an evaluation of a single-session BATD intervention for depressed college

students (Gawrysiak, Nicholas, & Hopko, 2009). In addition, a number of successful case studies of BATD have been published, including 6 depressed cancer patients (Hopko, Bell, Armento, Hunt, & Lejuez, 2005), 3 community mental health patients (Lejuez, Hopko, LePage, Hopko, & McNeil, 2001), two cases of comorbid anxiety and depression (Armento & Hopko, 2009; Hopko, Lejuez, & Hopko, 2004), a suicidal, depressed client with Borderline Personality Disorder (Hopko, Sanchez, Hopko, Dvir, & Lejuez, 2003), and a depressed adolescent (Ruggiero, Morris, Hopko, & Lejuez, 2007).

3. Identifying behavioral activation techniques

To identify the full range of BA techniques included in trials of BA, first the three comprehensive meta-analyses of BA by Cuijpers et al. (2007), Ekers et al. (2008), and Mazzucchelli et al. (2009) were reviewed. These analyses conducted comprehensive database searches to identify trials of BA, resulting in the identification of 44 trials across the three reports. Eight of these trials were excluded from the current analysis because they were unpublished dissertations (Barlow, 1986; Besyner, 1979; Cole, 1984; Graf, 1977; McKendree-Smith, 2000; Pace, 1978; Skinner, 1984; Weinberg, 1978). Including unpublished dissertations in empirical meta-analyses makes sense but because the current purpose was to catalog BA techniques, including unpublished dissertations did not make sense because any unrepresentative techniques in these studies would not be expected to impact the performance of BA in the clinical field. One study was excluded because it did not sufficiently describe techniques and did not reference a manual or article that did (Gaston, Marmar, & Thompson, 1988). Three trials were excluded because they were incorrectly characterized as BA interventions by the original meta-analyses. These excluded trials included Emanuels-Zuurveen and Emmelkamp (1996) which investigated a CBT approach with cognitive restructuring techniques from Beck et al. (1979), not BA; Hammen and Glass (1975) which was an experimental investigation of the effects of pleasant events scheduling on mood changes in college students, not a treatment study; and Scogin, Jamison, & Gochneaur (1989) which investigated Lewinsohn's self-help CBT approach, *Control your Depression* (Lewinsohn et al., 1986), not BA. This resulted in 32 trials. This methodology did not identify variants of BA that have been developed and published but have not been submitted to empirical testing; these variants are excluded from the current review as well. All trials included in this review are labeled with one asterisk in the reference list. One meta-analysis (Mazzucchelli et al., 2009) included several trials of self-control therapy (SCT; Rehm, 1977) in the analysis, which arguably is not a form of BA. We have included SCT in this review and discuss its similarities and differences with other forms of BA in the discussion.

Next, each trial was reviewed for information about the BA intervention used. A variety of theoretical and empirical articles, and treatment manuals, were cited in reference to BA interventions employed. Lewinsohn's seminal theoretical and empirical review of the behavioral theory of depression (1974) and later treatment manual (Lewinsohn et al., 1976) were frequently mentioned, but several other intervention manuals were also referenced (Beck et al., 1979; Gallagher et al., 1981; Lejuez, Hopko & Hopko, 2001; Martell et al., 2001; McLean, 1976; Rehm, 1977). These manuals were obtained. In some reports, references to Lewinsohn's previous theoretical and empirical reports were made along with a description of the treatment in the report with no additional manual reference; in those cases, the description was copied and used as the basis for the review. The second author then reviewed the manuals and descriptions obtained and categorized all interventions; this review was checked independently by the first and third authors with no disagreements.

Table 1 presents the 6 manuals and the categories of interventions identified in each manual. It is important to note that many trial

Table 1
Behavioral activation treatment manuals and their component techniques.

	AM	Values	AS	Skills	Relax	CM	Verbal	Avoid
Lewinsohn et al. (1976)	X		X	X	X	X	X	
Rehm (1977)	X	X	X			X	X	
Beck et al. (1979)	X		X	X				
McLean (1976)	X		X	X		X	X	
Gallagher et al. (1981)	X		X	X	X			
Martell et al. (2001)	X	X	X	X		X	X	X
Lejuez, Hopko & Hopko (2001)	X	X	X			X		

Note. AM = activity monitoring; Values = values and goals assessment; AS = activity scheduling; Skills = skills training; Relax = relaxation; CM = contingency management, Verbal = procedures targeting verbal behavior, Avoid = procedures targeting avoidance.

descriptions were explicit in describing the interventions employed and the interventions described did not always correspond with those of the manual referenced. For example, Lewinsohn et al. (1976) discussed the use of techniques targeting verbal behavior but many trials citing Lewinsohn et al. did not include this component. Specific variations from trial to trial are discussed in the text below.

Overall, eight overarching categories of BA interventions were derived from this process. These categories included activity monitoring, activity scheduling, contingency management (including managing rewards from others as well as self-reinforcement procedures), and a focus on values assessment. In addition, relaxation techniques were identified as having been incorporated into a minority of BA packages reviewed and are thus included herein. A variety of somewhat overlapping skills training techniques were identified, variously labeled communication skills, assertiveness, social skills as well as problem-solving and non-social skills training. These components are collectively labeled as skills training in the current review. Also, a set of techniques aimed at reducing avoidance behavior in depression has been developed and emphasized by Martell et al. (2001) and these are labeled as “procedures targeting avoidance” in the current review. Finally, techniques targeting what early BA approaches referred to as covert verbal behavior also were identified. This group of techniques is included in the current review and labeled “procedures targeting verbal behavior”.

Finally, a variety of ancillary BA techniques were identified. This included procedures that are considered common to all psychotherapies (e.g., Ilardi & Craighead, 1994), including establishing the therapeutic relationship and providing a rationale for treatment. Other ancillary techniques identified included agenda setting, maximizing the effectiveness of homework assignments, and teaching clients to anticipate and effectively deal with difficult life events post-treatment (e.g., relapse prevention). These ancillary strategies are not included in this review because they are not a focus of any treatment in this review and are seen as secondary to BA's mechanism of action.

4. Behavioral activation techniques

The review is organized roughly according to how techniques might be applied over treatment with a given client, beginning with assessment techniques (activity monitoring and values assessment), followed by activation techniques (activity scheduling and procedures targeting avoidance), and concluding with a range of procedures that function to increase the likelihood of successful completion of activation.

4.1. Activity monitoring

Almost every variant of BA reviewed contained a form of activity monitoring, prescribed early in treatment. Typically, activity monitoring serves two functions: to provide information on baseline activity levels and related moods to inform specific activation

assignments, and to demonstrate to the client the treatment rationale that there is a meaningful relation between activity and mood. In some cases detailed procedures were employed to track the relation between activity and mood, including graphs and printouts of the relations that were provided to clients (Zeiss et al., 1979). Early forms of BA (e.g., Fuchs & Rehm, 1977; Gallagher & Thompson, 1982; Lewinsohn et al., 1976; Zeiss et al., 1979) required clients to monitor activities as per the full Pleasant Events Schedule (PES; MacPhillamy & Lewinsohn, 1982), a list of 320 items identified as related to non-depressed mood, or a shortened version either alone or in conjunction with more idiographic activity schedules or charts to monitor behavior. Later forms of BA (e.g., Lejuez, Hopko, & Hopko, 2001; Martell et al., 2001) moved away from the PES as a monitoring device and used simple weekly activity charts, first seen as part of the behavioral techniques of CT by Beck et al. (1979). Martell and colleagues discussed several different aspects of behavior that can be assessed with an activity chart, including general activity level, avoidance behaviors, moods associated with different activities, experiences of mastery and pleasure associated with different activities, the breadth or restriction of activity, and consistency with values. Lejuez and colleagues added that activity monitoring provides a baseline measurement of activity to compare to as treatment progresses.

Thus, in BA, activity monitoring is not conceptualized as a behavior change intervention by itself, rather it is an assessment to support behavior change, and it is seen as a necessary precursor to behavior change efforts. Nevertheless, research indicates that activity monitoring may positively impact outcomes on its own. Activity monitoring as a stand-alone technique has been demonstrated to decrease problematic behaviors including smoking (McFall, 1970), binge eating (Latner & Wilson, 2002), and ruminative thoughts (Frederickson, 1975). Within cognitive and behavioral therapies, activity monitoring has successfully been used to facilitate cognitive restructuring (Hiebert & Fox, 1981; Rapee, Craske, & Barlow, 1990) and to decrease depressive symptoms and increase activity (Harmon, Nelson, & Hayes, 1980; O'Hara & Rehm, 1979; Reaven & Peterson, 1985). However, Graf (1977) found that activity monitoring plus scheduling performed better than activity monitoring alone, and many intervention studies have used self-monitoring as a control condition against which larger treatment packages have performed superiorly.

4.2. Assessment of goals and values

Although most BA treatments (and most other psychotherapeutic approaches) begin with some discussion of the client's goals for treatment, a minority of BA variants, primarily BATD by Lejuez, Hopko, and Hopko (2001) and to a lesser extent BA by Martell et al. (2001) and self-control therapy by Rehm (1977), specifically assess client goals and values in order to guide activation assignments. Notable here is BATD, which included a values assessment procedure simplified from that of ACT (Hayes et al., 1999), which has been incorporated into treatment by other recent BA authors as well (Gaynor & Harris, 2008; Houghton, Curran, & Saxon, 2008; Kanter, Busch, & Rusch, 2009; Uebelacker, Weisberg, Haggarty, & Miller, 2009; Veale, 2008). In BATD, a simple and structured values assessment protocol is provided. In this protocol, the client reflects on a list of potential valued life domains (e.g., family relationships, social relationships, education/training, physical/health issues, and spirituality) and is guided by the clinician to identify and clarify values of importance, resulting in specific statements of values. These stated values then suggest specific activation assignments that are in line with the value. For example, the value statement “I value being a good father” suggests activation assignments such as spending more time with one's children or fixing a child's broken toy. Gaynor and Harris (2008) adapted this values protocol for their study of values-based

behavioral activation for depressed adolescents and created a “Things I Can Do to Behave Consistently with My Values” chart.

Other variants of BA have incorporated discussion of goals and values related to activation to a lesser extent. Martell et al. (2001) called for these discussions but did not offer an explicit protocol and did not emphasize this to the degree emphasized in BATD. SCT also included a stage of developing goals and sub-goals to guide activation. For example, Fuchs and Rehm (1977) provided the example of a client who identified “pursuing my interest in cats as a hobby” as a goal with a sub-goal of going to the library for books about cats. A few early versions of Lewinsohn’s approach (Lewinsohn, Weinstein, & Alper, 1970; McLean & Hakstian, 1979) also explicated the importance of defining a client’s behavioral goals for treatment independent of broader generic discussions of treatment goals. In general, discussions of goals and values in BA function to identify important activation targets and as such these discussions can be seen as an additional assessment strategy, employed early in treatment in conjunction with activity monitoring to guide activity scheduling.

Because values may be seen as an issue of cognition and not behavior, a brief digression on the behavioral view of values is in order, as recently the concept has received some attention in the behavioral literature. Values, functionally, are seen as reinforcers and the process of identifying and verbally stating values may be seen as orienting the client toward broadly and ideographically defined positive reinforcers (Bonow & Follette, 2009). For example, “I value being a good father” does not specify a specific behavior but rather suggests a broad set of “good-father” behaviors which may be experienced as reinforcing if employed. Statements of values also may establish and augment available reinforcers verbally (Bonow & Follette, 2009; Plumb, Stewart, Dahl, & Lundgren, 2009). In other words, having stated a value, the statement itself may function as a reinforcer for value-relevant behavior. For example, stating “I value being a good father” in relevant contexts may render specific behaviors reinforcing simply because they are verbally evaluated as being consistent with being a good father, even if additional environmental support for the behavior is not forthcoming.

In BA these augmenting functions of values may be used to motivate and sustain activation behaviors when it is expected that reinforcers for activation behavior will not immediately occur (Kanter et al., 2009). For example, values interventions may be useful in activating weight-loss related behavior, exercise, or efforts to quit smoking because these activation behaviors result in the experience of immediate and powerful aversive states that otherwise would be avoided, and the activation behaviors are not immediately reinforcing in and of themselves (Plumb et al., 2009). Thus, when values are strongly held, as verbally-derived reinforcers they may sustain behavior in the face of competing, aversive consequences that otherwise would extinguish the behavior and evoke avoidance. When the positive consequences associated with an activation behavior are only expected to occur over the long-term, but the immediate consequences associated with the behavior are aversive (such as with exercising or quitting smoking), values may function as a verbal bridge over the immediate aversive consequences to the long-term positive consequences. This function of values—to generate alternative, value-guided behavior instead of experiential avoidance—is key to ACT (Hayes et al., 1999) and is consistent with BA’s procedures (Kanter, Baruch, & Gaynor, 2006) even though most of the theoretical writing on values has come from an ACT perspective (e.g., Hayes et al., 1999).

Values-based interventions are receiving increasing empirical support, both indirectly due to increased empirical support and attention for ACT interventions and directly through analog experimentation (see Plumb et al., 2009, for a review). There is, however, little empirical support for values assessment interventions outside of ACT, and how they contribute to BA’s effectiveness is currently unknown.

4.3. Activity scheduling

Activity scheduling is a hallmark of behavioral treatments for depression and was included in all trials reviewed herein with the exception of Lewinsohn et al. (1970) which focused purely on a social skills training approach. Activity scheduling has taken many different forms but the function remains the same—to increase contact with available sources of positive reinforcement in the environment (with the exception that SCT provides a somewhat different rationale for this). Typically, homework assignments are given by the clinician, in one form or another (e.g., written on activity charts, in day planners, other forms created for this purpose, or simply verbally specified) for the client to engage in specific behaviors intended to increase contact with positive reinforcers.

Early forms of BA (e.g., Gallagher & Thompson, 1982; Gallagher et al., 1981; Lewinsohn, 1974; Lewinsohn, Antonuccio, Steinmetz, & Teri, 1984; Lewinsohn et al., 1976; Lewinsohn, Muñoz, Youngren & Zeiss, 1978a, 1978b; McLean, 1976; Rehm, 1977; Zeiss et al., 1979) as well as some recent variants (e.g., Gallagher-Thompson et al., 2000, which targeted depressed caregivers of elderly patients) focused primarily on pleasant events scheduling in order to increase the rate at which clients engaged in mood-related pleasant activities, as determined by daily activity monitoring and mood ratings. Early behavioral approaches to activity scheduling often involved a modified version of the PES (MacPhillamy & Lewinsohn, 1982) either alone (Lewinsohn & Libet, 1972; Zeiss et al., 1979) or in conjunction with schedules created based on client’s activities over the course of the week (Lewinsohn et al., 1976). In one instantiation of SCT, Fuchs and Rehm (1977) modified the PES to 20 broad items that were used as a guide to activity monitoring and scheduling. At times, activity scheduling also included a broad focus on scheduling social activities in general (Lewinsohn et al., 1978a,b). Some research indicated that scheduling events specifically associated with improved mood was better than scheduling non-mood-related events (Graf, 1977).

Later versions of BA tended to move away from focusing on the pleasantness of activities scheduled to other criteria for determining activation targets. Lewinsohn et al. (1976) encouraged pleasant events scheduling and also scheduling “pinpointed” activities. First seen in CT by Beck et al. (1979), pleasure and mastery ratings of completed activities were used to distinguish pleasant events from events that resulted in a sense of mastery (e.g., Jacobson et al., 1996; Martell et al., 2001; Emanuel-Zuurveen & Emmelkamp, 1996). As stated above, BATD (Lejuez, Hopko, & Hopko, 2001) emphasized scheduling activities in line with the client’s values. As discussed below, BA by Martell et al., in addition to activity scheduling consistent with Beck et al., also encouraged scheduling specific behaviors as alternatives to avoidance and rumination, and emphasized the importance of ideographically determining activities to schedule based on functional analyses of avoidance behavior. In general, although clearly discussed in early writings on BA, later versions of BA appear to be more proficient at scheduling functionally important activities that are not regarded as pleasant or enjoyable.

CT by Beck et al. (1979) also emphasized the importance of graded task assignments that take into account the client’s current repertoire of skills relevant to the specific behaviors assigned, thereby maximizing the likelihood of success especially in the context of common symptoms of depression, such as fatigue and feelings of hopelessness. BA by Martell et al. (2001) picked up this theme and also encouraged graded task assignments and their initial procedures are largely consistent with Beck et al. (they also added several important procedures discussed below). Martell et al. encouraged verbal or imaginal rehearsal of assigned tasks, including role-playing, to identify obstacles to task completion and maximize the chances of successful task completion. They also emphasized the importance of building routines in which important tasks are completed regularly over time.

BATD (Lejuez, Hopko, & Hopko, 2001) took graded task assignment into account with a very structured activity scheduling protocol including various forms to guide the clinician and client in creating a graded activity hierarchy. This hierarchy functions similarly to a hierarchy in exposure treatments for anxiety disorders by ranking activities by level of difficulty (e.g., Brown, O'Leary, & Barlow, 2001; Franklin & Foa, 2008). The goal is to generate a diverse set of activities across the full spectrum of difficulty level, such that the client may gradually and steadily progress up the hierarchy by completing increasingly difficult activities.

Behaviorally speaking, the typical activity scheduling intervention may be seen as a form of stimulus control, a mainstay of the behavioral literature for several decades. In general, stimulus control techniques supply prompts in the environment for improved behavior or remove prompts for problem behavior and have been applied successfully for addictive behaviors (e.g., Witkiewitz & Marlatt, 2004), autism (Green, 2001; McEachin, Smith, & Lovaas, 1993) and insomnia (King, Dudley, Melvin, Pallant, & Morawetz, 2001), among other problems (Poling & Gaynor, 2003). Activity scheduling is seen as a form of stimulus control as it adds prompts into the client's environment in order to evoke the target behavior at a higher rate. Essentially, the prompt is the homework assignment which functionally constitutes a rule or instruction to engage in a specific behavior. These homework instructions often specify the behavior of interest in formal detail, including the what, when, where, and how of the behavior (e.g., play basketball at 2 pm on Saturday with friends in the park for 1 h). This may be specified on an activity chart, on a specific BA form created for this purpose, on a day planner, and so on. The homework assignment functions as an arbitrary antecedent, introduced into the client's environment, designed to evoke new behavior. Thus, relevant questions for the BA clinician include where the client will keep the homework assignment and when the client will look at the homework assignment.

Martell et al. (2001) also described the use of other forms of stimulus control to evoke new behavior, for example a plan for a client who wanted to exercise more to set out a gym bag with appropriate clothing the night before in order to increase the likelihood of completing the activity (p. 96). Recently, more technologically advanced methods have been suggested to assist with reminding clients to complete homework assignments, such as the use of cellular phones (e.g., Boschen & Casey, 2008). Kanter et al. (2009) note that specific stimulus control procedures may be helpful particularly in cases when clients initially forget to complete the scheduled activities.

Variants of activity scheduling began to gain empirical support in the late 1970's (Barrera, 1979; Zeiss et al., 1979) and it is possible that such techniques are as effective as other empirically supported approaches to depression (Cuijpers et al., 2007; Ekers et al., 2008) in the absence of more complex techniques. Although activity scheduling is well supported empirically (Cuijpers et al., 2007), there is no empirical support for any incremental utility provided by the nuances of activity scheduling suggested by various BA authors, such as emphasizing mastery or the function of events rather than pleasantness, the use of supplemental stimulus control techniques, or the use of graded tasks or structured hierarchies. In fact, although the notion of graded task assignments has intuitive appeal, research on exposure protocols in anxiety does not unequivocally support the use of graduated exposures (Craske, Kircanski, Zelikowsky, Mystkowski, Chowdhury, & Baker, 2008).

4.4. Skills training

A variety of skills training interventions, including social skills (variously labeled social skills, assertiveness, interpersonal skills, or communication skills) and non-social skills such as problem-solving, were identified in the trials reviewed. In general, skills training interventions have been used when a client does not know *how* to engage in effective behavior. Skills training is suggested for clients

lacking the ability to emit the desired behaviors in a manner that will be reinforced in the environment.

Such skills deficits for depressed individuals often are social in nature (Weissman & Paykel, 1974), and social skills training has been utilized within behavior therapy for depression for several decades (e.g., Bellack & Hersen, 1979). The rationale for social skills training was first provided by Lewinsohn (1974), who noted that for some clients, activity scheduling will fail because, even in the presence of available social reinforcement, the client may not possess the requisite skills for obtaining and maintaining contact with this reinforcement. Although various versions of social skills training exist, they often include techniques such as modeling, role-playing, and providing therapeutic feedback in order to shape new behavior in session, followed by homework assignments to attempt the new behavior after it has been shaped to the point of being deemed sufficiently effective in session (Segrin, 2003). These procedures often include a stimulus control component in that the client is taught to identify the appropriate cues and prompts for specific social behaviors. Zeiss et al. (1979) included assertiveness and interpersonal skills training using a format similar to this (instruction, modeling, rehearsal, and feedback). McLean (1976) included similar procedures targeting marital communication, general social interactions, and assertiveness, and also included provision of information and some contingency management procedures with significant others. Only Lewinsohn et al. (1970) significantly deviated from this pattern, addressing social skills deficits with a group therapy approach that used the peer group and the therapist to reinforce improved behaviors in the group interaction (for this review, this was categorized as a contingency management intervention).

Social skills training procedures are discussed by Martell et al. (2001), but not Lejuez, Hopko, and Hopko (2001). Martell and colleagues address social skills deficits using role-playing of behavioral assignments that involve social interactions, allowing the clinician to model the desired behavior when playing the client and to provide feedback to the client when playing the other individual. They also included in depth discussion of the client's plan for specific social interactions and how the client believes others will respond. Thus, the typical stages of social skills training are discussed by Martell and colleagues, albeit not in the typical step-by-step sequence.

Sometimes non-social skills were targeted in BA treatment approaches through activity scheduling. Kanter et al. (2009) point out that, in the context of BA, social skills problems can be trained to some extent in the session, while non-social skills problems often call for remedial or skill building homework assignments. For example, if the patient requires computer skills to post his or her resume online, the therapist could give an assignment to go to a basic computer class or to check out a computer tutorial from the library. Thus, it is likely that non-social skills training is often encompassed within activity scheduling.

In addition, non-social skills deficits have been targeted with problem-solving interventions. Several forms of BA included a problem-solving component in response to clients with poor everyday decision-making and problem-solving skills as well as difficulties with major life decisions (Gallagher & Thompson, 1982; McLean & Hakstian, 1979). Formal problem-solving treatments have been developed as stand-alone interventions such as those described by D'Zurilla, Nezu and colleagues (D'Zurilla & Goldfried, 1971; D'Zurilla & Nezu, 1982; Nezu, Nezu & Perri, 1989; Nezu & Perri, 1989). Like social skills training interventions, historically these interventions have been seen as variants of behavior therapy for depression, although they clearly are focused in this case on developing a cognitive skill. These interventions vary in form, however in general they teach a structured problem-solving sequence. For example, Nezu et al. (1989) suggest a five step process in which (1) the problem is delineated, (2) alternative solutions to the problem are brainstormed, (3) the alternatives are evaluated, (4) the

steps needed to implement the chosen alternative are identified, and (5) the solution is implemented and evaluated. McLean (1976) employed as part of his BA an optional four-step procedure very similar to the five steps of Nezu and colleagues. In Martell et al. (2001), a step-by-step procedure is not employed but clinicians are encouraged to help clients clarify specific goals, determine the steps necessary to achieve each goal, implement these steps, observe the outcome, and identify and implement alternate behaviors if necessary. Problem-solving procedures following Nezu, Nezu, & Perri (1989) have been used in an adaptation of BATD for depressed cancer patients (Hopko et al., 2008).

The data in support of these skills training components of BA varies. Social skills training as a stand-alone treatment has been associated with decreases in depressive symptoms equivalent to other treatment packages (Bellack, Hersen, & Himmelhoch, 1981, 1983; Zeiss et al., 1979) and is a component of other empirically supported treatment packages such as CT or Dialectical Behavior Therapy (Linehan, 1993). Formal problem-solving interventions have been listed as a “possibly efficacious” empirically supported treatment for depression (DeRubeis & Crits-Christoph, 1998), and although problem-solving therapy and BA suggest different mechanisms of action there is considerable overlap in that both aim to foster active problem solving styles and decrease avoidant problem solving. However, the impact of less structured problem-solving procedures in the context of a larger BA treatment package has not been studied.

4.5. Relaxation training

A small number of BA treatments described relaxation training (Gallagher et al., 1981; Lewinsohn et al., 1976; Lewinsohn et al., 1978a,b; Lewinsohn et al., 1984), primarily as an optional technique used to target sleep difficulties (Lewinsohn et al., 1976); however, Zeiss et al. (1979) used relaxation to “enhance the enjoyability” of pleasant activities engaged in by the client (p. 433). In their review of self-help interventions for depressive disorders and depressive symptoms, Morgan and Jorm (2008) found that nine randomized controlled trials had evaluated progressive muscle relaxation for adolescents or adults with depressive disorders, and that overall, relaxation training may lead to greater symptom reduction compared to a wait-list or minimal control group, but less symptom reduction compared to psychological interventions for depression such as CT. Morgan and Jorm (2008) suggested that perhaps relaxation training is useful in treating depression due to the overlap between depressive symptoms and anxiety.

4.6. Contingency management

Contingency management procedures were included in many of the trials reviewed. Functionally, these procedures are intended to address situations in which approximations towards improved behavior are punished, ignored, or otherwise not reinforced by the environment, or when problematic behavior is maintained by positive or negative reinforcement in the environment. Essentially, the issue is that the environmental consequences are problematic and need to be rearranged to support improved behavior. In BA interventions, consequences arranged through contingency management interventions are public and relatively manipulable—specific rewards are provided by the client or others in response to client behavior, or specific changes in other's behaviors are arranged in response to client behavior. The clinician may also arrange contingencies in session to support improved behavior. A wide variety of contingency management interventions have been described over the years. They appear to be a frequent aspect of treatment, typically of lower priority than activity scheduling.

SCT (Rehm, 1977) assumed that a fundamental problem in depression was that reinforcement for non-depressed behavior was

not forthcoming so the client had to learn self-reinforcement to maintain behavior in the absence of environmental support. The therapy therefore added a self-reinforcement phase to typical pleasant events scheduling during which the clinician and client develop “reward menus” that specify rewards for attaining different point totals. Points, in turn, are assigned based on how difficult or important each scheduled activity is to the client. The client then administers the appropriate rewards based on how many points were earned based on completed activation assignments. Gallagher-Thompson et al. (2000) similarly taught clients to reward themselves for maintaining new activity schedules but did not provide details on the nature of this procedure. BATD (Lejuez, Hopko, & Hopko, 2001) also instructs clients to self-administer rewards on a weekly basis if they have met their goals (i.e., completed activation assignments) for that week. Martell et al. (2001) suggested clients reward themselves for completion of activation assignments that are not reinforcing in and of themselves (such as an arbitrary self-reward like going to a nice meal after being more assertive with a difficult boss). A variant of this was provided by Catanese, Rosenthal and Kelley (1979) which recommended that the client “decrease blue moods by mildly punishing yourself when you do get blue” (p. 301). Essentially these approaches invoke a self-administered token economy for improved or problem behavior. A token economy was formally used (tokens for achievement of BA-related goals exchanged for grounds passes, phone cards, snacks, etc.) in the instantiation of BATD on an inpatient unit by Hopko, Lejuez, LePage, et al. (2003).

Lewinsohn et al. (1970) addressed the issue of not having adequate control over the contingencies in a depressed client's life through a group therapy approach in which group members and the clinician reinforced behaviors consistent with and extinguished behaviors inconsistent with each client's goals in the group interaction. This approach limited target behaviors to social skills that would be likely to occur in group settings. More recently, Kanter, Manos, Busch, and Rusch (2008) suggested techniques for reinforcing active, non-depressed behavior in the therapeutic relationship in BA as per the guidelines of Functional Analytic Psychotherapy (Kohlenberg, & Tsai, 1991).

Lewinsohn et al. (1976) discussed the use of contingencies to achieve several treatment-related goals. These included making the next therapy appointment contingent upon completing tasks assigned in the previous session, and a “credit” system in which the client's therapy bill is adjusted up or down depending on completion of tasks and compliance with therapy procedures. Like SCT, (Rehm, 1977; Fuchs & Rehm, 1977), they also suggested use of a self-reward menu which specifies self-rewards for completion of specific assignments, and they also suggested the use of a formula linking the mean number of daily activities to minutes of therapy time (see Lewinsohn, 1974). Padfield (1976) similarly made therapy time contingent on completion of activities.

Several variants of BA employed formal contracts with friends and family members to reinforce desired behaviors (Comas-Díaz, 1981; Lewinsohn et al., 1976; Teri, Logsdon, Uomoto, & McCurry, 1997). BATD (Lejuez, Hopko, & Hopko, 2001) provides specific guidelines for arranging such contracts. For example, a contract may be drawn between a client and his mother, with the mother agreeing to stop doing the client's laundry and dishes and be more supportive of the client's attempts to engage in the non-depressed behavior. McLean (1976) suggested the use of reciprocal behavioral contracts in which spouses agree to specific and positive changes in behavior in order to increase behavioral productivity and reduce depressed mood. Martell et al. (2001) suggested bringing significant others into treatment to change their responses to the client that may be reinforcing depressed behavior (such as a friend who “covers” for a client at work when she calls in sick).

Contingency management has been used within behavioral interventions for decades, particularly for addictive behaviors,

where it has large effects (e.g., Olmstead, Sindelar & Petry, 2007; Schumacher et al., 2007; Melin, Andersson, & Götestam, 1976), but there is no research specifically on the effectiveness of this component of depression treatment. Behavioral contracts as a specific intervention also have empirical support (Houmanfar, Maglieri, & Roman, 2003), including the use of behavioral contracts to reduce the frequency of targeted depressive behaviors (Brannon & Nelson, 1987).

4.7. Procedures targeting verbal behavior

Although it is often said that behavioral approaches to depression fell out of favor because they did not focus on cognitive mediators of depression (Dobson & Dozois, 2001), it does not logically follow that cognitive content was never targeted by these approaches. In fact, Lewinsohn's early theory (1974) included discussion of negative cognitive content, and several BA variants included methods for targeting covert verbal behavior (Lewinsohn et al., 1976; Lewinsohn et al., 1978a,b; Martell et al., 2001; McLean, 1976). The techniques employed vary substantially.

These methods differ clearly from later CT approaches in that they did not attempt to restructure the content of cognition but rather focused directly on frequency of occurrence, seeking to decrease the frequency of negative covert verbal behaviors and increase the frequency of positive covert verbal behaviors. In this way and consistent with behavioral theory (e.g., Skinner, 1953), verbal behavior was not treated as different in kind from other forms of behavior therefore necessitating a different term (i.e., cognition). Verbal behavior was seen as different only in that it was behavior observed only by the individual engaging in it. Procedures targeting verbal behavior included thought monitoring, substitution of negative with positive thoughts, direct suppression, rehearsal of positive thoughts about oneself, and clinician modeling of positive self-talk (McLean, 1976). Lewinsohn et al. (1976) describe techniques such as Wolpe and Lazarus's (1966) thought-stopping procedure and rehearsal of positive thoughts to target "obsessional thinking."

SCT (Rehm, 1977) emphasizes several cognitive treatment targets, arguably to such an extent that SCT should not be considered a variant of BA. SCT includes three phases: self-monitoring, self-evaluation, and self-reinforcement. In the self-evaluation phase, the SCT model focuses on inaccurate attributions of causality of events, and treatment includes monitoring of inaccurate attributions and training in accurate attributions. During this phase, the SCT model also focuses on overly stringent self-evaluative criteria, and treatment similarly includes monitoring of self-evaluations and training in more realistic standards for success. SCT may be considered a variant of BA because the self-monitoring phase of treatment included fairly typical activity monitoring strategies, and the self-evaluation phase includes an activity scheduling emphasis. The final self-reinforcement phase is primarily a contingency management strategy (as discussed above) but also encourages the use of positive evaluative self-statements as covert rewards for improved behavior (Rehm, Kaslow, & Rabin, 1987).

More recently, behavioral theory has begun to view thoughts more contextually and efforts to directly suppress or replace cognitive content as in earlier BA approaches as futile. Martell et al. (2001) focused on rumination as a form of behavior and encouraged clinicians to perform functional analyses of rumination rather than trying to change its content as might a cognitive clinician. Unlike early forms of BA which took a relatively simple approach that emphasized reducing the frequency of negative covert verbal behavior, Martell and colleagues recommended a more functional approach that encouraged clinicians to explore the context in which rumination occurs for specific clients and the consequences that maintain it. Specifically, they viewed rumination as a form of avoidance behavior, maintained by negative reinforcement in the form of temporary reductions in anxiety or related private events. Clinicians are encouraged to help clients identify the specific triggers for rumination

as avoidance, and the negative reinforcers that maintain it (discussed in more detail next), on a case by case basis. This contrast between early approaches which focus on frequency and that of Martell and colleagues which focuses on idiographic function is characteristic of these treatments generally, not just with respect to verbal behavior.

According to Martell et al. (2001), a key issue with respect to rumination is that when it occurs, it results in a loss of contact with the immediate environment. Thus, an alternate behavior to activate is "attending to experience" (p. 124) in which the client refocuses attention on his or her immediate experience of the surrounding environment (see Martell & Kanter, *in press*). Martell and colleagues suggest that attention to the immediate environment allows the client to become a better observer of the antecedents and consequences to his or her problematic behavior, thus developing the skill of performing functional analyses of one's own behavior and more accurately observing the results of attempts at implementing alternative coping.

The empirical basis of specific behavioral techniques targeting verbal behavior, such as thought-stopping, was challenged during the 1970s when such procedures were common, especially for the treatment of anxiety and worry (Tryon, 1979), and little research has surfaced since to improve the situation. In fact, evidence continues to accrue that thought suppression and stopping behavior is implicated in psychopathology and is counterproductive in treatment (Najmi & Wegner, 2008). More recent research, largely of an analog experimental nature, is accruing suggesting that attention-to-experience or mindfulness manipulations, such as suggested by Martell et al. (2001), are effective compared to suppression and stopping manipulations, but these experiments were designed to evaluate components of ACT interventions, not BA interventions (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). The empirical status of the use of cognitive techniques in the treatment of depression, broadly speaking, continues to be controversial, despite years of research on this topic (Longmore & Worrell, 2007; Hofmann, 2008; Worrell & Longmore, 2008).

4.8. Procedures targeting avoidance

Although procedures targeting avoidance are specific to BA by Martell et al. (2001) and not discussed in other BA variants, due to the current prominence of and empirical support for this approach some space is devoted to describing these procedures. Historically, behavioral theory of depression focused on deficits in positive reinforcement while behavioral theory of anxiety focused on excessive negative reinforcement (e.g., avoidance). Early on, however, Ferster (1973) commented that the two are inter-related and this theme was elaborated by Martell et al. who emphasized several related procedures to help clients identify avoidance problems and activate alternate behaviors in the face of strong, competing avoidance tendencies. In Martell et al., activity scheduling to contact positive reinforcement remains the primary technique and these procedures targeting avoidance are added to increase the success of activation. First, based on Ferster's analysis, they present a contextual model of depression that accords avoidance behavior a central role, and offer a clear rationale for clinicians to present to clients to facilitate treatment engagement and treatment progress. Specifically, the authors suggest that often avoidance behaviors in depression are a means of coping with the depressed feelings themselves. Clients become caught in a vicious cycle of depressed feelings and reacting to these feelings with avoidance behavior such as social withdrawal and spending more time in bed which temporarily alleviates the feelings but ultimately creates more of them. Martell and colleagues suggest that treatment should help clients learn to "act according to a goal rather than according to a feeling" (p. 116) or work from the "outside-in" (p. 63) to change behavior without waiting for or needing feelings to change first.

Martell et al. (2001) emphasize teaching clients to functionally assess their own avoidance behavior through use of the acronym TRAP, in which *T* stands for *trigger*, *R* stands for *response*, and *AP* stands for *avoidance pattern*. This acronym is used throughout treatment and activation assignments are built off it, in the form of *alternative coping* behaviors that replace the *AP* of TRAP with an *AC*, resulting in the convenient phrase “Get out of the TRAP and get back on TRAC(K)” (p. 102). This model has two purposes. First, it can be used to guide activation assignments to directly target avoidance behavior. In addition, by teaching clients to functionally assess their worn avoidance, they can self-activate towards alternative coping behaviors without needing a formal assignment.

It should be noted that while the majority of BA treatments do not explicitly target avoidance, the general strategy of acting from the “outside-in” is built into the basic premise of activity scheduling and may be seen as implicit to it (Hopko, Lejuez, Ruggiero, & Eifert, 2003). In BATD (Lejuez, Hopko, & Hopko, 2001), for example, a hierarchy of activation assignments is created based on identified goals that explicitly acknowledges that activation assignments will be difficult to complete, and feelings and other private events are not directly targeted. Empirically, it remains to be established if Martell et al.'s (2001) more explicit focus on avoidance behavior as a means to activation or more traditional straightforward activation approaches that implicitly address avoidance will be distinguishable in terms of feasibility, acceptability, or efficacy.

Focusing on the role of avoidance in establishing or maintaining depressed mood is not unique to BA. The role of avoidance in psychopathology in general is widely recognized. Hayes et al. (1996) have introduced the term *experiential avoidance* to describe behaviors controlled by the avoidance of aversive private events. They suggest that experiential avoidance applies to many diagnostic categories, and the growing empirical support for ACT interventions targeting experiential avoidance across a variety of settings and populations supports this claim (e.g., Dahl, Wilson, & Nilsson, 2004; Dalrymple & Herbert, 2007; Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Gifford et al., 2004; Twohig, Hayes, & Masuda, 2006a; Twohig, Hayes, & Masuda, 2006b; Woods, Wetterneck, & Flessner, 2006). Barlow, Allen, and Choate (2004) have similarly suggested that emotional avoidance is one of three basic therapeutic components necessary for the treatment of depression and anxiety disorders. Although Martell and colleagues' version of BA has received empirical support (Coffman et al., 2007; Dimidjian et al., 2006; Dobson et al., 2008), and the conceptual basis for these avoidance-focused interventions is clear, it is important to note that there is no direct support for these interventions such as there is for other techniques such as activity scheduling.

5. Integration and discussion

The primary points of this review are that BA, as applied over the last 30 years, consistently includes activity monitoring and scheduling but is often more than these and is quite diverse with respect to the specific techniques included and the manner in which these techniques are employed. From an empirical standpoint it is unclear which components, or what combination of components, are necessary or maximally effective at decreasing depressive symptoms. Several of the techniques often employed as components of BA packages have received empirical support as stand-alone interventions for depression (activity scheduling, relaxation, and skills training), although it is clear that some interventions are more effective than relaxation alone (Morgan & Jorm, 2008). Several techniques have received empirical support as major components of treatment packages for other disorders (relaxation, contingency management, and procedures targeting avoidance).

While recognizing the diversity of components, activity monitoring and scheduling are the constant components across all of the forms of

BA reviewed. An important point is that activity scheduling is not synonymous with pleasant events scheduling but targets a variety of activities in the client's life related to pleasure, mastery, goals and values, problems to be solved, areas of avoidance, and so forth, often determined individually between the client and the therapist. Activity scheduling is a relatively simple technique, likely easier to train and implement than the larger treatment packages within which it is often embedded. If the history of randomized component analyses of psychotherapy for depression is to be our guide (Luborsky et al., 2002; Wampold et al., 1997), future component analyses of BA treatment packages will *not* suggest that the larger treatment packages offer any advantage over simple activity scheduling (of course, various criticisms to this approach to deciding component effectiveness exist). Thus, it may be the case that activity scheduling will surface as a primary active ingredient that is responsible for BA treatments' empirical success across various BA treatments. While this is speculation, it is not speculation to suggest that BA clinicians and researchers would benefit from a primary focus on activity scheduling.

To the extent that such speculation is true, BATD by Lejuez, Hopko, and Hopko (2001; Lejuez et al., *in press*) offers a relatively straightforward and structured instantiation of activity monitoring and scheduling, unencumbered by additional techniques with the exception of a values assessment procedure to supplement activity monitoring and some contingency management procedures. BATD has received some empirical support (Daughters et al., 2008; Gawrysiak et al., 2009; Hopko et al., 2005; Hopko, Lejuez, LePage, et al., 2003; Hopko et al., 2004; Lejuez, Hopko, LePage, et al., 2001; Hopko, Sanchez, et al., 2003), but it has not been tested in a single trial with the same rigor and sophistication as has BA by Martell et al. (2001), although larger studies are emerging (Hopko et al., 2010). BA by Martell and colleagues also includes activity scheduling but the procedures are less structured and integrated with other techniques, such as those targeting avoidance. Examination of the two treatment manuals leads to the hypothesis that BATD will be easier to train and disseminate than BA by Martell et al. (2001) and potentially as effective. This comparison has not been evaluated, but Hopko, Lejuez, Ruggiero, and Eifert (2003) have offered a detailed theoretical comparison of the two treatments that may be helpful to readers.

Although sometimes lumped together without distinction (for example, reports on BATD that cite research on BA by Martell et al., 2001, as supportive of BATD), it is clear from this review that BA and BATD are not equivalent treatments in terms of technique. The relative merits of BATD versus Martell et al.'s (2001) BA may depend on the setting and the population studied. Although beyond the scope of this review, it should be noted that BA and BATD techniques have been applied to several problems in addition to, or comorbid with depression, and in settings in addition to outpatient mental health. Additional problems targeted by BATD include comorbid depression and substance use (Daughters et al., 2008), depressed cancer patients (Hopko et al., 2005), comorbid anxiety and depression (Hopko et al., 2004), a case of a suicidal depressed individual with Borderline Personality Disorder (Hopko, Sanchez et al., 2003), and a case of an adolescent with depression and a history of child maltreatment (Ruggiero et al., 2007), while those targeted by Martell et al.'s (2001) BA include comorbid depression and obesity (Pagoto, Bodenlos, Schneider & Spates, 2008), post-traumatic stress disorder (Jakupcak, et al., 2006) and comorbid depression and post-traumatic stress disorder (Mulick & Naugle, 2004; Wagner, Zatzick, Ghesquiere, & Jurkovich, 2007). Additional settings in which BATD has been applied include university counseling centers (e.g., Gawrysiak et al., 2009), inpatient hospital settings (e.g., Daughters et al., 2008; Hopko, Lejuez, LePage, et al., 2003) and primary care (e.g., Hopko et al., 2005; Uebelacker et al., 2009). A general theme here may be that BATD has been employed for problems and settings that require more efficiency, whereas the BA of Martell et al. (2001) has been applied more consistently to outpatient mental health settings.

Although clearly more complex than BATD, BA by Martell et al. (2001) has been quite successful in a large randomized trial in an outpatient mental health setting with a depressed sample (Dimidjian et al., 2006; Coffman et al., 2007; Dobson et al., 2008), suggesting that it may be quite powerful with respect to both CT and anti-depressant medications. This version of BA includes activity monitoring and scheduling, some suggestions for informal values assessment, social skills training, contingency management, and procedures targeting rumination and avoidance. It also emphasizes teaching clients to conduct functional analyses of their own behavior. The treatment is relatively unstructured and the clinician is expected to implement techniques based on a functional case conceptualization. Thus, while many techniques are available to the therapist, not all are applied with every client. The emphasis on avoidance in this version of BA is different than prior forms of BA but is bolstered by converging lines of research from other disorders and treatments, particularly ACT. BA clinicians have developed refinements to the treatment package that may result in more structure (Martell, Dimidjian & Herman-Dunn, 2010) and improve both research and training efforts. Even though more complex than BATD, it is likely that BA by Martell and colleagues is still easier to train and disseminate than CT, although this is an empirical question that awaits further study.

What is BA's mechanism of action? Any attempt to precisely define mechanism is obfuscated by the plethora of techniques, each of which may be conceptualized as targeting different mechanisms. Empirically, there is some support for the notion that changes in the type and frequency of activity can lead to improved mood, but this research is relatively imprecise (for a review, see Manos, Kanter, & Busch, 2010). Overall, BA treatments present variations on the theme that activity scheduling functions to obtain response-contingent positive reinforcement from the environment. For example, Fuchs and Rehm (1977) emphasized self-reinforcement because environmental reinforcement was not forthcoming. Lejuez et al. (2001) emphasized the relative rates of reinforcement for depressed and non-depressed behavior, and Martell et al. (2001) emphasized activating individuals to obtain positive reinforcement while blocking behavior aimed at negative reinforcement (avoidance). Other approaches offer subtle variants on these themes, addressing a variety of depressive symptoms (e.g., sleep, overt and covert verbal behavior, social behavior deficits) with a variety of techniques. All of the theories are positive reinforcement-based and thus it may be said that the common theme across BA variants is the importance of natural and stable sources of positive reinforcement for a healthy, non-depressed lifestyle (Kanter et al., 2009; Manos et al., in press).

It may be argued that the variety of techniques reviewed herein suggests that the larger umbrella term should be *behavior therapy* rather than the more specific *behavioral activation*. Indeed, this is consistent with how the set of techniques was described throughout the 1970s and 1980s, until Jacobson et al.'s (1996) component analysis triggered a resurgence of interest in the techniques under the term *behavioral activation*. Personally we prefer the newer term because it is less likely to conjure pejorative associations that have accumulated around the term *behavior therapy*, it is user-friendly and clients are likely to respond positively to the simple rationale with which the term is eponymous. Finally, although a variety of techniques are included under the umbrella term, a compelling argument can be made that the function of the overall set of techniques, as a unit, is to activate behaviors that contact positive reinforcement as discussed above (Kanter et al., 2009).

5.1. A possible structure for BA techniques

How might a clinician sort through the diversity of component BA techniques for a particular client? A simple solution is to learn Martell et al.'s (2001) BA or Lejuez, Hopko, and Hopko's (2001) BATD, for which current training opportunities exist. The current review

suggests, however, that learning only one BA variant may not maximize the potential of BA's full arsenal. An additional significant limitation of the BA variants is that none of them specify how a clinician may decide on which components to implement, at which times, and for which clients. As discussed in Kanter et al. (2009), a logical sequence may be to start with standard assessment strategies, including activity monitoring and values assessment, which leads to a plan for activity scheduling. This sequence essentially duplicates that of BATD and is consistent with BA. If a client does not respond to this initial sequence, additional and more complex techniques may be implemented as needed as specified in this review.

This overall approach has several potential benefits. First, given the primacy of activity scheduling across variants of BA and the empirical support for it, as well as its relatively straightforward rationale and ease of administration, starting with activity scheduling in lieu of more complicated techniques makes sense pragmatically, logistically, theoretically and empirically. Second, this stepped approach may make the BA clinician more efficient, allowing the clinician to reserve more functionally complex components only for clients who do not respond to the initial activation attempt. Third, a stepped approach makes sense for clients, for whom treatment techniques and the dose of treatment may be tailored depending on problems and response.

It may be beneficial for future researchers to consider research on such stepped approaches to BA and necessary components of BA, as well as process research to better understand the mechanisms of action of BA. Currently, while variants of BA have existed for several decades, and it is clear that, as a group, they represent a powerful set of empirically supported interventions, there is much work to be done to clarify and maximize the power of the set of techniques falling under the BA umbrella.

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