Behavioral Activation for Depression in Older Adults: Theoretical and Practical Considerations

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Late-life depression (LLD) is a major public health concern that can have devastating effects on older individuals and their families. Behavioral theories predict that decreases in response-contingent positive reinforcement and increases in negatively reinforced avoidance behaviors, often accompanied by aversive life events, result in the selection and maintenance of depression. Based on these theories, behavioral activation treatments for depression are designed to facilitate structured increases in enjoyable activities that increase opportunities for contact with positive reinforcement. We discuss the applicability of behavioral models for LLD, and we briefly review current behavioral activation interventions for LLD with an emphasis on implications for future behavior-analytic research. Behavioral activation has been demonstrated to be effective in reducing depression and increasing healthy behavior in older adults. Potential challenges and considerations for future research are discussed. We suggest that applied behavior analysts and clinical behavior analysts are particularly well suited to improve and expand on the knowledge base and practical application of behavioral activation interventions with this population.
Key words: older adults, depression, behavioral activation, applied behavior analysis, clinical behavior analysis

Late-life depression (LLD) is a significant public health concern, and may have numerous deleterious effects on the health and well-being of older adults and their families (Fiske, Wetherell, & Gatz, 2009). LLD has been associated with increased risk of self-neglect, morbidity, mortality, and suicide, as well as decreased physical, cognitive, and social functioning (Blazer, 2003). Family caregivers of older adults with depression are also at risk for poor mental health (McCusker, Latimer, Cole, Ciampi, & Sewitch, 2007) and increased burden, which in turn may negatively affect rates of recovery in care recipients (Martire et al., 2008).

By 2030, approximately one fifth of Americans are anticipated to be 65 or older (Vincent & Velkoff, 2010), and the number of older individuals with mental health problems is projected to double from 7.5 to 15 million (John A. Hartford Foundation, 2011). Thus, the need for behavioral clinicians and researchers to address problems such as LLD is likely to increase considerably.

Clinically significant depressive symptoms have been found to occur in approximately 8% to 16% of community-dwelling older adults (Blazer, 2003) and in nearly 50% of long-term care residents (Levin et al., 2007); however, these estimates may be low. Depression is likely to be underdiagnosed in older individuals because it is often comorbid with medical illness, and may be compounded by neurological and functional impairment (Fiske et al., 2009; Wilkins, Mathews, & Sheline, 2009). In addition, older adults may be less likely than younger adults to report depressive symptoms because they are perceived as a natural part of aging (Sarkisian, Lee-Henderson, & Mangione, 2003).

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Although antidepressant medication is the most common treatment for LLD (Thakur & Blazer, 2008), this approach may be problematic. Older adults may hesitate to take antidepressants for reasons such as fear of dependency and the attribution of depression to social rather than medical causes (Givens et al., 2006). Antidepressants also carry the risk of harmful side effects for older adults, such as increased risk of falls, gastrointestinal bleeding, and insomnia (Thakur & Blazer, 2008), as well as potentially serious interactions with other medications (Mark et al., 2011). Because older adults are unlikely to seek mental health services (Wetherell et al., 2004), dissatisfaction with antidepressants may lead some to discontinue pursuing treatment. Moreover, medication does not address environmental aspects of depression. As a result, older individuals who take antidepressants may receive inadequate care.

Considering the prevalence and the potentially devastating consequences of LLD, along with the limitations and risks of antidepressant medication, there is a strong need for effective, nonpharmacological treatment and prevention approaches. The purpose of this article is to examine depression in later life within the theoretical and practical context of behavioral models. First, we briefly review the development and application of behavioral theories regarding the onset, maintenance, and treatment of depression. Next, we discuss the applicability of behavioral models to depression in older adulthood. Behavioral activation interventions for LLD are then briefly reviewed, with an emphasis on implications for future behavior-analytic research. We conclude with a discussion of the strengths and potential challenges of behavioral activation for older adults, along with related opportunities for applied behavior analysts and clinical behavior analysts and recommendations for future research.

BEHAVIORAL MODELS OF DEPRESSION: DEVELOPMENT AND APPLICATION

In contrast to medical models that consider depression as a syndrome with an essential composition, behavioral models perceive depression as a multitude of overt and covert behaviors that vary considerably among individuals, consistent with the wide variety of historical and environmental controlling variables (Biglan, 1991; Kanter, Busch, Weeks, & Landes, 2008). A behavior-analytic examination of depression requires the determination of antecedent and consequent events within the individual's current living environment that maintain operationally defined depressed behavior, including overt behavior (e.g., social avoidance, changes in eating patterns), private events (e.g., feeling worthless or anxious), affective responses (e.g., crying episodes), and verbal behavior (e.g., rumination or self-critical statements). Therefore, behavioral conceptualizations of depression view depressive symptoms as depressed behaviors.

Behavior analysts have been concerned with understanding the nature of emotions and their place in a science of behavior since the inception of behavior analysis as a discipline (e.g., Skinner, 1938). It was Charles Ferster, Skinner's close collaborator, who identified a decreased frequency of positively reinforced activity as "the common denominator" among individuals with depression (Ferster, 1973, p. 861). Concurrently, Lewinsohn and colleagues developed the first comprehensive behavioral model of depression. In accordance with other behavioral conceptualizations of depression, this model holds that depression is the result of a loss or lack of response-contingent positive reinforcement (RCPR), often accompanied by stressful or aversive life events that disrupt daily routines and activities (Dimidjian, Barrera,

Martell, Munoz, & Lewinsohn, 2011; Jacobson, Martell, & Dimidjian, 2001; Lewinsohn, 1974). Put simply, individuals with depression engage in fewer overt behaviors that provide pleasure or enjoyment than do individuals who are not depressed. In addition to decreased engagement in activities that result in positive reinforcement, Ferster (1973) noted that individuals with depression engage in a high frequency of behaviors that function to escape or avoid aversive stimuli (e.g., staying in bed all day to avoid attending a social outing). Although avoidance behaviors may temporarily alleviate discomfort, these behaviors can further reduce engagement in activities that provide reinforcement and, in turn, may contribute to depression maintenance. Reductions in reinforcement for nondepressed, healthy behaviors may result in a decreased frequency or extinction of these behaviors, which can lead to feelings of reduced confidence, uncertainty, and helplessness (Skinner, 1974).

Supporting the behavioral conceptualization of depression, Lewinsohn and colleagues (Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1972) found a significant association between self-reported mood and pleasant activities, with depressed individuals engaging in fewer activities and finding fewer activities pleasant than did nondepressed individuals. On the basis of these findings, Lewinsohn and colleagues developed a comprehensive behavioral treatment that focused on following a schedule of activities described by the client as pleasant or enjoyable (Dimidjian et al., 2011). Branching from this work, Jacobson and colleagues conducted a component analysis of cognitive behavioral therapy (CBT) and found that the behavioral component alone was as effective as the entire CBT package in both the treatment of depression and the prevention of relapse (Gortner, Gollan, Dobson, & Jacobson, 1998;

Jacobson et al., 1996). Jacobson and colleagues subsequently developed a behavioral activation treatment model that stressed the importance of individual needs and goals, and used components such as activity and mood monitoring, guided activity scheduling, value-based behavioral goal setting, and procedures to counter engagement in avoidance behaviors (Martell, Addis, & Jacobson, 2001). Consistent with Ferster (1973), Jacobson and colleagues emphasized the use of functional analysis procedures (perhaps more properly called functional assessment, in that functional relations are identified via client self-report) to determine environmental antecedents and consequences that may contribute to the onset and maintenance of depression.

Following the component analysis of CBT by Jacobson and colleagues, Lejuez, Hopko, and Hopko (2001) developed a behavioral activation treatment for depression (BATD) that was based on the matching law (Herrnstein, 1961, 1970). Applied to depression, the matching law asserts that the relative frequency of reinforcement for depressed behavior compared to nondepressed behavior is proportional to the relative value of reinforcement provided for these behaviors. Therefore, depression is maintained because (a) rates of reinforcement for nondepressed behavior are relatively low or nonexistent; and (b) rates of reinforcement for depressed behavior are relatively high compared to those for nondepressed behavior. BATD includes an activity hierarchy in which selected activities are ranked according to difficulty and progressively completed. In addition to negatively reinforced avoidance behaviors, BATD examines positive reinforcement for depressed behavior (e.g., sympathetic social attention; Lejuez, Hopko, Acierno, Daughters, & Pagoto, 2011; Lejuez et al., 2001).

Contemporary approaches to behavioral activation include contingency management, skills training

for individuals who lack the ability to engage in nondepressed behaviors that will obtain reinforcement in the living environment, and procedures that target verbal behavior, with activity monitoring and scheduling being the most frequently used components (Kanter et al., 2010). Because deficits in RCPR are central to behavioral models of depression, procedures to increase RCPR are a common focus of behavioral activation treatments. The effectiveness of this parsimonious approach has resulted in the recognition of behavioral activation as meeting criteria for a well-established treatment for depression, as determined by the American Psychological Association (Mazzucchelli, Kane, & Rees, 2009). In the treatment of adults with major depression, a randomized placebo-controlled trial found that behavioral activation is as effective as antidepressant medication and more effective than CBT during acute treatment (Dimidjian et al., 2006), comparable to CBT in the prevention of relapse, and more enduring and cost effective relative to antidepressant medication across a 2-year follow-up period (Dobson et al., 2008). Providing additional empirical support for behavioral models of depression treatment, daily diary studies have found that depressive symptoms are associated with less frequent engagement in social and physical activity (Hopko & Mulane, 2008), and that cognitive and behavioral avoidance is associated with increased risk for depression through decreases in RCPR (Carvalho & Hopko, 2010).

Because a comprehensive overview of behavioral activation is beyond the scope of the present paper, we refer interested readers to several excellent reviews on behavioral activation's history and current application (Dimidjian et al., 2011; Kanter et al., 2010), empirical evidence (Mazzucchelli et al., 2009; Mazzucchelli, Kane, & Rees, 2010), and assessment strategies (Manos, Kanter, & Busch,

2010). For the current discussion of behavioral activation and LLD, *behavioral activation* may be defined as a structured treatment approach that aims (a) to increase engagement in adaptive behaviors and enjoyable activities; (b) to decrease engagement in behaviors that maintain depression or increase the risk of depression; and (c) to target factors that restrict access to reinforcement or maintain aversive control (Dimidjian et al., 2011).

BEHAVIORAL PERSPECTIVES ON LLD

Behavioral models of depression may be useful when considering the inherent challenges of older adulthood. Later life is associated with difficult losses in many domains that once provided sources of reinforcement, including the death of spouses or other loved ones; the loss of occupational, familial, and social roles; reduced cognitive and physical health; and impaired daily functioning. Fiske et al. (2009) reported that half or more cases of geriatric major depression present as a new condition beginning at age 60 or later (late onset depression). As Fiske et al. pointed out, although this may be partly affected by biological factors, a less studied possibility is that late onset depression represents "a response by individuals with certain longstanding vulnerabilities to the occurrence of a unique configuration of stressful life events and losses" (p. 365). Similarly, others have suggested that the development of LLD may be afffected by environmental factors characteristic of older adulthood (e.g., Pope, Watkins, Evans, & Hess, 2006; Thakur & Blazer, 2008; Wilkins et al., 2009). Skinner (1987) maintained that decreases in positive reinforcement occur as a result of biological and environmental changes in late life, which can contribute to depression:

In old age, behavior is not as strongly reinforced. Biological aging weakens reinforcing consequences. Behavior is more and more likely to be followed by aches and pains and quick fatigue. Things tend to become "not worth doing" in the sense that the aversive consequences exact too high a price. Positive reinforcers become less common and less powerful. … When the occasion for strong behavior is lacking or when reinforcing consequences no longer follow, we are bored, discouraged, and depressed. But it is a mistake to say we suffer from feelings. We suffer from the defective contingencies of reinforcement responsible for the feelings. (pp. 153–154)

Loneliness and social isolation that may occur as an older individual's social network decreases can further contribute to depression (Adams, Sanders, & Auth, 2004). Particularly for older adults with functional impairment, formal or informal caregivers may become primary sources of social interaction. However, interactions with these individuals may have the unintended effect of increasing depressive symptoms. Martire, Stephens, Druley, and Wojno (2002) found that high levels of spousal assistance were associated with greater depression in older women with physical limitations who valued functional independence. Examining interaction patterns between older adults and their caregivers, Baltes and Wahl (1992, 1996) found that dependent behaviors often result in social reinforcement from caregivers, while independent, healthy behaviors are typically ignored in both institutional and community settings. Thus, as dependent behaviors tend to increase in frequency, independent behaviors (e.g., self-care activities) may occur infrequently, if at all. As a result, older adults may experience reduced feelings of control, self-efficacy, and mastery, which have been associated with depression in later life (Jang, Bergman, Schonfeld, & Molinari, 2006; Yang, 2006).

Illness and disability have also been associated with increased risk of LLD (Huang, Dong, Lu, Yue, & Liu, 2010; Watson et al., 2006), perhaps particularly when these conditions result in functional impairment (Zeiss, Lewinsohn, Rohde, & Seeley, 1996). Functional limitations impair an individual's ability to engage in activities that were once enjoyed, which results in a loss of RCPR. For instance, sensory impairment can lead to reductions in the frequency and quality of enjoyable activities (e.g., driving, watching television, social interaction). Depression is common among older adults with visual impairment (Casten, Rovner, & Tasman, 2004) and hearing loss (A. T. Lee, Tong, Yuen, Tang, & Vanhasselt, 2010), and related restriction of engagement in valued activities is associated with greater depression (McDonnall, 2009; Rovner & Casten, 2002).

Some older adults may engage in avoidance behaviors that restrict participation in activities feared to pose a health risk. Fear of falling and related activity restriction are prevalent among older adults who live in the community (Boyd & Stevens, 2009) and in long-term care facilities (Gillespie & Friedman, 2007), and can result in the reduction or elimination of activities that once provided positive reinforcement. In addition to potentially negative effects on health and functioning (Deshpande et al., 2008; Scheffer, Schuurmans, Van Dijk, Van der Hooft, & De Rooij, 2008), such avoidance behaviors have been associated with anxiety symptoms (Van Haastregt, Zijlstra, Van Rossum, Van Eijk, & Kempen, 2008), which are common among depressed older adults (King-Kallimanis, Gum, & Kohn, 2009), may further increase risk of morbidity and mortality (Diefenbach & Goethe, 2006), and may further reduce quality of life (Diefenbach, Tolin, & Gilliam, 2012). Although fear of falling has been associated with lower activity levels and increased depression and anxiety (Painter et al., 2012), activity engagement may attenuate adverse effects on well-being related to this fear (Chou, Yeung, & Wong, 2005).

Although activity restriction (e.g., Williamson & Shaffer, 2000) and infrequent participation in social and leisure activities (e.g., Adams et al., 2004; C. T. Lee et al., 2012) are associated with depression in older adults, engagement in activities is related to greater psychological well-being (e.g., Gautam, Saito, & Kai, 2007; Jenkins, Pienta & Horgas, 2002; Pressman et al., 2009) and may mediate the negative impact of functional limitations on depression (Benyamini & Lomranz, 2004). The empirically demonstrated inverse relation between activity engagement and mental health outcomes in later life adds further support to the applicability of behavioral models for the development and treatment of LLD.

RESEARCH ON BEHAVIORAL ACTIVATION FOR LLD

Behavioral activation interventions have been found to be effective with a broad range of population groups in treating depression (e.g., Cuijpers, Van Straten, & Warmerdam, 2007; Mazzucchelli et al., 2009, 2010). Although few studies have examined behavioral activation with older adult populations, such approaches are gaining increasing attention (Dimidjian et al., 2011). In this section we briefly describe findings from the current literature on behavioral activation for LLD. A total of 17 studies were identified using PUBMED and PsycINFO databases, with the search terms *behavioral activation*, *activity scheduling*, and *pleasant events* in combination with *depression* and *older adults* or *elderly*. Studies in our review included (a) participants with a mean age of at least 60 years and (b) a primary treatment focus on reducing depression through structured increases in enjoyable or meaningful activities. The methodological quality of current studies was found to vary broadly in a manner that precluded meaningful quantitative

analysis; thus, we focus on a narrative review of primary findings and their implications for future behavior-analytic research.

Participant and Setting Characteristics

Current studies indicate that behavioral activation can be implemented in a variety of settings and services for older adults. Studies in the community included outpatient clinics (Acierno et al., 2012; Bottonari, Roberts, Thomas, & Read, 2008; Gallagher & Thompson, 1982; Lazzari, Egan, & Rees, 2011; Rokke, Tomhave, & Jocic, 1999; Thompson, Gallagher, & Breckenridge, 1987; Turner & Leach, 2009) and the client's home (Quijano et al., 2007; Teri, Logsdon, Uomoto, & McCurry, 1997; Yon & Scogin, 2009). Studies in residential care settings included assisted living (Cernin & Lichtenberg, 2009; Dozeman et al., 2011), nursing homes (Meeks, Looney, Van Haitsma, & Teri, 2008; Meeks, Teri, Van Haitsma, & Looney, 2006), a short-term rehabilitation unit (Sood, Cisek, Zimmerman, Zaleski, & Fillmore, 2003), and inpatient psychiatric care facilities (Clignet, Van Meijel, Van Straten, Lampe, & Cuijpers, 2012; Snarski et al., 2011).

Several studies demonstrated the successful implementation of behavioral activation interventions by non-mental-health professionals such as case managers (Quijano et al., 2007), occupational therapists (Sood et al., 2003), residential care staff (Cernin & Lichtenberg, 2009; Dozeman et al., 2011; Meeks et al., 2006, 2008), and family caregivers (Teri et al., 1997). Acierno et al. (2012) showed that individuals with varied levels of training and expertise (ranging from recent graduates of bachelor programs in psychology to experienced social workers) were able to implement behavioral activation. Moreover, behavioral activation interventions delivered via telephone (Acierno et al.; Quijano et al., 2007) or

videoconferencing (Lazzari et al., 2011) were also effective. These findings suggest considerable simplicity and flexibility in implementation, which has important implications for future research and practice.

The age of participants in these studies ranged from 62 to 84 years. They presented with major or minor depression, and comorbid anxiety was assessed in five studies (Acierno et al., 2012; Dozeman et al., 2011; Meeks et al., 2006; Thompson et al., 1987; Turner & Leach, 2009). Few studies included older adults with cognitive impairment (Snarski et al., 2011; Teri et al., 1997), chronic medical illness (Dozeman et al., 2011; Meeks et al., 2008; Quijano et al., 2007), chronic pain (Acierno et al.; Meeks et al., 2006; Quijano et al., 2007), or diagnoses of psychiatric disorders such as schizophrenia (Snarski et al., 2011); thus, there is limited evidence for the effectiveness of behavioral activation with such individuals. Conclusions are also limited for individuals of more advanced age (85 years and older) and older adults with severe depression.

It will be important for future research to consider constraints and opportunities associated with settings and client characteristics and the potential impact of these variables on behavioral activation. For instance, activity engagement depends on the availability and accessibility of social and tangible resources. In community settings, factors such as location (e.g., urban or rural areas) and transportation may enhance or restrict activity options. Similarly, activity engagement in residential care settings may be affected by factors such as institutional schedules and staffing levels. In terms of client factors, chronic health conditions often involve physical symptoms of fluctuating intensity that may periodically reduce the reinforcing effectiveness of engagement in some activities (e.g., social events); thus, activities that can be enjoyed during periods of poor health (e.g., listening to music or reading) should also be planned and scheduled. For clients with cognitive impairment, it may be necessary to plan prompts for activity engagement that are more frequent or more salient than for clients without cognitive impairment.

Dependent Measures

The majority of studies used self-rating scales to assess depression, anxiety, and other measures such as grief, quality of life, and health-related functioning. Although these measures may be meaningful in assessing progress, self-reports may be limited in terms of reliability. Several studies used ratings from other individuals such as family caregivers (Teri et al., 1997), clinicians (Rokke et al., 1999), and two independent evaluators (Gallagher & Thompson, 1982). In addition to client self-report, inclusion of ratings from independent observers or individuals who have frequent contact with older clients may improve the reliability of these measures.

Although activity engagement is integral to the implementation of behavioral activation, few studies included dependent measures of activity participation. Turner and Leach (2009) assessed self-reported participation daily in 15-min intervals across four broad response classes consisting of self-care, housekeeping and errands, paid or volunteer work, and hobbies or recreation. This study also collected data from a pedometer as an objective measure of the client's physical activity. Several studies assessed self-rated engagement in terms of frequency and pleasantness of activities (Meeks et al., 2006, 2008; Rokke et al., 1999; Thompson et al., 1987; Yon & Scogin, 2009) and frequency and duration of social and physical activity (Quijano et al., 2007). Only two studies included staff-reported activity participation and direct observation of activity participation and

affective responses (Meeks et al., 2006, 2008). Future research that includes more objective measures of activity engagement, as well as social and functional outcomes, may enhance internal validity and generalizability of treatment effects.

Intervention Components

Activity selection and scheduling. Several studies described the use of measures such as activity inventories (Cernin & Lichtenberg, 2009; Meeks et al., 2006, 2008; Sood et al., 2003; Teri et al., 1997), activity lists included in treatment manuals (Clignet et al., 2012; Dozeman et al., 2011), and lists of community activities and resources (Acierno et al., 2012) to provide suggestions for planning activities. Other studies used collaborative activity selection based on individual goal setting (Bottonari et al., 2008; Lazzari et al., 2011; Quijano et al., 2007; Rokke et al., 1999; Snarski et al., 2011; Turner & Leach, 2009; Yon & Scogin, 2009). Scheduled activities based on client-rated levels of difficulty were also used (Acierno et al., 2012; Clignet et al., 2012; Lazzari et al., 2011; Snarski et al., 2011). Acierno et al. (2012) incorporated social aspects into selected activities as often as possible, and included identifying activities that were negatively reinforcing (e.g., chores that reduced stress when finished) and activities that were incompatible with avoidance behavior.

In all of the current studies, little or no information was provided about the selected activities, such as how they may have differentially affected levels of engagement or other dependent measures, whether they were readily accessible, and whether activity schedules were followed as planned. A few studies included activity-related information such as time of day, duration, and location of activities (Turner & Leach, 2009), whether activities were completed in or out of the client's room (Meeks et al., 2006), and staff-recorded group rates of completed and attempted activities (Meeks et al., 2008). Future studies that include objective measures of activity engagement can strengthen conclusions about both the effectiveness of activity schedules and the function of the selected activities as reinforcement for individual clients.

Functional assessment and contingency management. Several studies included specific descriptions of indirect functional assessment activities, such as the collaborative identification of avoidance behaviors that may maintain depression (Bottonari et al., 2008; Turner & Leach, 2009), identification of sources of positive reinforcement in the client's living environment that could serve to maintain goal-oriented behaviors (Turner & Leach, 2009), and instruction of caregiver strategies for identifying and altering contingencies that may contribute to depression or associated behavior problems (Teri et al., 1997). Contingency management strategies such as using rumination as a prompt to engage in enjoyable activities (Bottonari et al., 2008) and providing social reinforcement for client efforts and progress (Acierno et al., 2012; Lazzari et al., 2011; Meeks et al., 2006, 2008; Sood et al., 2003) were also used. Future studies can contribute to more precise determination of environmental conditions that may facilitate or compromise the effectiveness of behavioral activation, as well as the effects of behavioral activation on depressed and nondepressed behavior maintained by positive or negative reinforcement.

Consideration of variables that may limit activity engagement. Several studies described variables that may prevent or decrease the likelihood of future engagement in activities, such as lack of appropriate activity materials and ineffective staff prompts (Meeks et al., 2008), low energy and chronic pain (Meeks et al., 2006), and client problem behaviors (Teri et al.,

1997), although specific strategies for addressing these issues were not discussed. Acierno et al. (2012) incorporated therapeutic exposure in the form of scheduling previously enjoyed activities that were avoided due to their association with a recently deceased spouse or romantic partner (e.g., attending church services). Teaching skills that may be needed to enable activity participation may also be useful, such as relaxation techniques to reduce feelings of anxiety (Gallagher & Thompson, 1982; Sood et al., 2003) and strategies for identifying and requesting help from individuals who may provide needed assistance (Clignet et al., 2012). Future studies can further develop effective assessment and management strategies for individual barriers to participation in enjoyed activities. In addition to intervention, these considerations have important implications for the maintenance of treatment effects.

Design

As previously mentioned, the reviewed studies range widely in methodological quality and rigor from a case study without systematic data analysis (Clignet et al., 2012) to a randomized controlled clinical trial (Teri et al., 1997). The majority of studies used AB designs with infrequent measurement (i.e., 2 or 3 data points). However, several studies included design components that enabled the repeated assessment of level, direction, and trends in target behaviors before, during, and after intervention, such as a no-treatment baseline (Lazzari et al., 2011; Meeks et al., 2006; Turner & Leach, 2009; Yon & Scogin, 2009) and a maintenance phase (Lazzari et al., 2011; Meeks et al., 2006; Turner & Leach, 2009). Two studies included multiple baseline designs across participants (Meeks et al., 2008; Yon & Scogin, 2009). The use of single-subject designs in future research can strengthen conclusions regarding the effects of behavioral activation on individual behavior change over time. Designs that permit examination of separate as well as combined effects of intervention components would enable determination of potential differential treatment effects (i.e., multiple treatment interference) that would help to identify necessary and sufficient elements for individual clients.

Effectiveness of Behavioral Activation for LLD

Behavioral activation interventions were associated with significantly reduced depressive symptoms relative to control groups (Meeks et al., 2008; Snarski et al., 2011), treatment as usual, and a wait-list condition (Teri et al., 1997), along with lower posttreatment occurrence of depression compared to a control group (Sood et al., 2003). Behavioral activation was found to be comparable in effectiveness to cognitive therapy (Gallagher & Thompson, 1982; Rokke et al., 1999; Thompson et al., 1987) and problem-solving therapy (Teri et al., 1997). Single-subject design studies demonstrated significant decreases in depression following baseline (Lazzari et al., 2011; Yon & Scogin, 2009) and previous exposure to cognitive therapy (Bottonari et al., 2008), decreases in depression and anxiety (Turner & Leach, 2009), and significant increases in positive affect (Lazzari et al., 2011; Meeks et al., 2006).

In addition to significant decreases in the primary dependent measures, significant reductions were observed in self-reported measures of pain, interference of physical or emotional health with social activities (Quijano et al., 2007), and role limitations due to physical or emotional causes, with significant increases in self-reported physical and social functioning (Acierno et al., 2012). Other reported functional gains include significant increases in self-care activities, housekeeping, and time spent outside the

home (Turner & Leach, 2009), and significant increases in out-of-room activity by a nursing home resident (Meeks et al., 2006). Maintenance of treatment gains was reported at 1 month (Lazzari et al., 2011) and 4 months (Turner & Leach, 2009) after behavioral activation treatment.

Although Dozeman et al. (2011) did not observe significant improvements after behavioral activation in their assisted living sample, Cernin and Lichtenberg (2009) found decreases in depression and significant increases in subjective global mood among assisted living residents. However, Dozeman et al. used a nondepressed sample, whereas Cernin and Lichtenberg included residents with mild to moderate depression. Moreover, in the study by Dozeman et al., facility staff who served as intervention coaches spent an average of 48 min across two visits with each resident, and only 21% of participating residents completed the intervention. Conversely, Cernin and Lichtenberg used a target goal of three 30-min sessions per week across a 3-month period, and had an implementation rate of 68%. This comparison suggests that baseline client characteristics (e.g., depression severity), frequency of client contact, treatment duration, and treatment completion rates affect outcomes during behavioral activation; therefore, these factors are important to consider in the design and application of future interventions.

PRACTICAL RECOMMENDATIONS

Current studies suggest that behavioral activation is an effective treatment for LLD across a wide spectrum of settings. Behavioral activation is easy to understand, is cost effective, may be delivered via telephone or videoconferencing, and requires minimal training; therefore, it can be implemented in a variety of community and residential services that assist older adults and their families. Behavioral activation can also be adapted for use with individuals who have cognitive impairment and may be effective for older adults with comorbid anxiety. In addition, much of the current research has demonstrated that non-mental-health professionals can be trained to implement behavioral activation for LLD (e.g., Cernin & Lichtenberg, 2009; Quijano et al., 2007; Teri et al., 1997). Further, as previously discussed, research indicates that this approach may be particularly appropriate to address environmental risk factors often experienced by this population. Dimidjian et al. (2011) identified the application of behavioral activation with older adult populations as critical area for future research. Indeed, LLD may be an especially needed application of behavioral activation, because depression is prevalent among older adults and current treatment models for LLD may not consider environmental variables that contribute to the onset and maintenance of depression in late life.

Although behavioral activation interventions for depression are based on behavior-analytic theories and models, the reviewed literature supports the conclusion by Kanter, Callaghan, Landes, Busch, and Brown (2004) that these interventions largely do not employ behavior-analytic methods and analyses. Thus, as proposed by Kanter et al., we suggest that behavior analysts are particularly well equipped to address the gap that currently exists between theory and practice. Because the need for simple, cost-effective, nonpharmacological interventions for LLD is presently high and unlikely to decrease with the growing aging population, and because LLD can have devastating effects on individuals and families, we further suggest that behavioral activation approaches for older adults comprise an especially important and socially significant area of investigation. Specifically, we

propose that behavior analysts could enhance the application of these interventions by (a) identifying environmental contingencies that may support or complicate intervention; (b) using behavior-analytic methods and procedures to address potential challenges and improve internal and external validity; and (c) determining the most effective ways to train individuals who are most likely to have contact with older adults to implement these interventions.

Behavior Change in LLD: Preintervention Considerations

As previously discussed, behavioral models of depression predict that depressed behavior is caused by a loss or lack of positive reinforcement, often exacerbated by negatively reinforced avoidance behaviors that provide short-term relief from potentially aversive situations and decrease the future likelihood of positive reinforcement for nondepressed, healthy behaviors. Therefore, consistent with these models, increasing the frequency of activities that provide positive reinforcement should result in a decreased frequency of depressed behavior. However, some depressed behaviors (e.g., self-critical statements) may be maintained by positive reinforcement. For example, these behaviors may be unintentionally reinforced by social attention from caregivers or family members. Selection and maintenance of these behaviors may be likely for older individuals who have experienced losses of powerful sources of reinforcement (e.g., spousal death, retirement), perhaps especially for those who lack an adequate repertoire to obtain alternative sources of reinforcement (e.g., making new friends, volunteer work, acquiring a new hobby; Dougher & Hackbert, 1994). Older adults with physical or cognitive limitations that necessitate the assistance of others may be highly likely to receive social reinforcement for dependent or passive behavior, may engage in few independent behaviors, and may also be unable to participate in many activities that were once enjoyed; therefore, these individuals may be particularly at risk of developing behavioral patterns that may lead to depression. In such circumstances, increased engagement in enjoyable activities may result in a decreased frequency of depressed behavior, but it is possible that positively reinforced depressed behaviors will persist despite the addition of competing sources of reinforcement. Thus, a more appropriate behavioral model of LLD may be extended to include examination of both positive and negative reinforcement of depressed behavior, consistent with the behavioral model of depression developed by Lejuez et al. (2001) that is based on the matching law.

These considerations highlight the significance of direct and indirect functional assessment of depressed behavior and, if feasible, functional analyses to determine environmental contingencies that may enhance or complicate the effectiveness of behavioral activation interventions with older adults. Including family members and caregivers into treatment plans may also be needed. For example, differential reinforcement may be planned during which reinforcement for depressed behavior is withheld while social reinforcement is provided for nondepressed behavior (e.g., engagement in activities). Such procedures may make behavioral activation more effective, and may increase the likelihood of treatment maintenance. It may also be advisable to consider the contingencies that operate on the client's family members and caregivers. For these individuals, responding to the client's depressed behavior with sympathetic social attention may be reinforced by the client's responses (e.g., when the client smiles or says he or she feels better). Likewise, these individuals may provide assistance to the client

(e.g., with activities of daily living or leisure activities) to a greater degree than necessary, which may result in a premature decrease in the client's healthy, independent behaviors. In addition to providing positive reinforcement for the helping individual, excessive assistance may also provide negative reinforcement through the avoidance of aversive consequences (e.g., the task takes longer if the client were to complete it independently). The client's depressed behavior may also be negatively reinforced by the temporary suppression of another individual's aversive social behavior (e.g., verbal and nonverbal expressions of anger or disapproval; Biglan, 1991). These contingencies may have the unintended effect of maintaining the client's depression, thus potentially compromising the effectiveness of behavioral activation.

Potential Challenges for Implementation of Behavioral Activation

We suggest that at least four main areas represent potential challenges for implementation of behavioral activation interventions with older adults. First, the acceptance of behavioral activation treatment rationale may be necessary for older clients and those involved with their care. Quijano et al. (2007) found that older adults who believed that activity engagement is important for well-being completed more behavioral activation treatment steps than did those who did not perceive engagement to be important. Activities based on behavioral goal setting may be effective in achieving acceptance, because older adults with depression who set goals (e.g., spending more time with family) may be more likely to accept treatment (Weinberger, Mateo, & Sirey, 2009). Education for clients, families, and paid care providers that discusses empirical support for behavioral activation as well as the relation be-

tween activity engagement and well-being in late life may be helpful. Baseline monitoring of activity and mood may also be helpful for initially reluctant individuals, perhaps particularly when data are visually displayed to demonstrate a relation.

Second, activities or pleasant events must actually provide positive reinforcement. In other words, activities must be sufficiently reinforcing so that engagement in them results in an increased likelihood of engagement in the future. As noted by Skinner, positive reinforcement is what makes activities pleasant and enjoyable: "Positive reinforcers please. We call them pleasant and the behavior they reinforce a pleasure" (1989, p. 83). Nevertheless, activities that are verbally described or identified as pleasant or enjoyable may not predict subsequent levels of engagement. Thus, it may be best to record levels of engagement (e.g., active manipulation of activity materials or interactions with others) during activities in addition to self-reports for initial activity assessment. Monitoring engagement levels during treatment may help to ensure that planned activities continue to be enjoyable. For older adults with cognitive impairment, multimedia versions of activity inventories that include pictorial and textual representations of stimuli may be more reliable than verbal self-report (LeBlanc, Raetz, Baker, Strobel, & Feeney, 2008).

Third, successful behavioral activation treatments require following activity schedules and activity monitoring. These tasks may be labor intensive for clients, care providers, or family members to maintain, and may result in a decreased likelihood of treatment adherence. Therefore, schedules and monitoring procedures should be as simple and straightforward as possible. In addition, care providers and family members may become discouraged when clients resist or rarely initiate participation in activities. Prompting procedures

may be useful for these situations. Positive social attention and personalized prompts designed to describe activities in terms of individual preferences were found to increase social activity attendance in assisted living residents with low baseline levels of participation (Polenick & Flora, 2011). This study also incorporated activity preference assessment and data-collection procedures that were already used by facility staff, which reduced the amount of additional effort required to implement the intervention and monitor progress.

Fourth, there are presently relatively few graduate programs that provide training for the design and application of behavioral activation interventions. Moreover, few programs in clinical psychology and applied behavior analysis provide training opportunities for behavior-analytic practice and research with older adult populations. Although there are several excellent clinical programs that train students from a behavior-analytic perspective, these programs are the exception. We hope that this will change in the future, but we encourage students, researchers, and practitioners who are currently interested in behavior-analytic applications of behavioral activation for LLD to engage in interdisciplinary research and practice opportunities. Collaboration with researchers or practitioners who specialize in gerontology and mental health interventions (e.g., physicians, nurses, psychologists, social workers) can provide abundant opportunities for applied behavior analysts and clinical behavior analysts to become involved in this rapidly growing area of research and practice. We also refer readers to the series of related recommendations outlined by LeBlanc, Heinicke, and Baker (2012) for applied behavior analysts who are interested in expanding their scope of practice to new consumer groups such as older adults. These recommendations include increasing professional competence by reading behavioral and nonbehavioral research relevant to the new population, becoming active in organizations such as the Gerontological Society of America, and pursuing additional training and mentoring from a BCBA with experience in the area. LeBlanc et al. emphasize that it is critical to develop effective communication skills with diverse professionals who work in this area, which involve the use of colloquial descriptions for behavioral procedures and the mastery of terminology specific to the new population. Involvement in activism, volunteerism, and public service activities through organizations such as the local area agencies on aging as well as consulting with adult day centers, continuing care retirement communities, assisted living facilities, nursing homes, and rehabilitation providers may further increase training and employment opportunities.

Directions for Future Investigation

In addition to addressing the preintervention considerations and potential challenges for implementation described above, future research could contribute to the practical application of behavioral activation interventions for LLD by examining issues related to the methodological limitations identified in the current literature review. In terms of activity selection, it may be important to assess differential treatment effects between activities that involve passive engagement (e.g., watching television) and active engagement (e.g., playing card games), and between social and nonsocial activities. Likewise, differences between activities that are described simply as pleasant and activities that are personally meaningful or value based may be important to determine. It will be imperative to identify effective ways to assess and plan activities that incorporate individual interests and preferences, emphasize functional strengths and abilities, and increase contact with available sources of

reinforcement. As noted by Turner and Leach (2009), scheduled activities may function as behavioral cusps if they (a) increase access to new reinforcers, contingencies, and environments; (b) have social validity; (c) facilitate subsequent learning; (d) compete with inappropriate behavior; and (e) provide benefit to others (Bosch & Fuqua, 2001). Thus, planning activities that fit this category may be particularly effective in enabling the individual to further increase and maintain contact with positive reinforcement for nondepressed behavior. For example, an individual who joins a walking group may subsequently visit with friends from the group and may be encouraged to join other activity groups (e.g., art classes) that may result in the development of additional friendships and may lead to independent activity engagement at home (e.g., drawing or painting). The walking group activities may also improve physical fitness, which may lead to engagement in other enjoyable physical activities (e.g., weight lifting). Thus, initial participation in one activity may lead to the availability of multiple new sources of reinforcement. Although this phenomenon would be difficult to measure, attempts to plan these activities could provide valuable information on activities that may help to increase and maintain healthy behaviors that provide positive reinforcement.

The inclusion of independent, objective measures of activity participation would improve internal validity by increasing confidence that clients are engaging in scheduled activities. Measures such as weekly attendance data collected for activities attended either in the community or in a residential care facility could be assessed, along with data recorded by family members or other individuals who interact frequently with the client. Direct, observable change in other dependent measures would also enhance internal validity by demonstrating that these interventions reliably result in objective (as well as subjective) behavior change. In addition to changes in private events, changes in overt behavior and affective responding that are meaningful for the client and his or her family (e.g., interval recording of social interaction during activities, frequency counts of crying episodes, the number of independently completed activities of daily living) could be examined.

It will be important to determine which intervention components are most effective with different populations of older adults. Adding one component at a time while monitoring data would enable ongoing examination of potential differential effects. Kanter et al. (2010) suggested a stepped approach to behavioral activation that begins with activity monitoring, values assessment, and activity scheduling, and implements additional components (e.g., contingency management, procedures that target avoidance behaviors) only if clients do not respond to initial treatment. Such an approach is parsimonious and may provide valuable information in terms of necessary and sufficient components for older adults with various presenting characteristics (e.g., cognitive or physical impairment, comorbid anxiety). Although a planned reversal of the intervention may not be practical or ethical, it would be important to assess changes in private events, overt behaviors, or affective responses during periods of time when the client does not engage in enjoyable activities. If it can be empirically demonstrated across multiple individuals, behaviors, and settings that levels of stable baseline measures reliably improve only when behavioral activation is applied, the internal and external validity of these interventions would be greatly strengthened.

It is necessary to acknowledge, however, that real-world variables associated with this population may

complicate the application of behavior-analytic interventions. Biological factors (e.g., levels of hormones or neurotransmitters) as well as comorbid medical illness, disability, and cognitive impairment likely contribute to the onset and maintenance of LLD. Although it is not known how such physical variables affect operant behavior in this population, it is possible that these factors may alter the reinforcing effectiveness of engagement in daily activities in addition to reducing the individual's functional capacity to engage in activities. The unpredictable nature of these variables as well as the likelihood of multiple sources of environmental control may result in unstable baselines for depressed behavior and activity engagement. Thus, implementation of the most powerful single-subject designs may present a formidable challenge. The reliable assessment of objective, independent measures of activity engagement and reinforcement derived from activities may further complicate implementation. Moreover, there are currently no reliable and valid functional analysis procedures for LLD in clinical or residential settings, and such procedures may not be practical to implement.

Given these challenges, one approach for future interventions might be to measure daily levels of overt and covert depressed behaviors concurrently with levels of engagement in scheduled activities along several potentially relevant dimensions (e.g., frequency, duration, location, social or nonsocial, passive or active). Compared to stable baseline measures, which could be determined by a stability criterion (e.g., at least four consecutive scores less than 5 points from the original score on a depression inventory; Yon & Scogin, 2009), an analysis of the temporal relations between depressed behavior and activity engagement could reveal characteristics of scheduled activities that are most effective for individual

clients. Recording the occurrence of uncontrolled variables (e.g., pain, illness, the death of a loved one) would enable examination of their effects on depressed behavior and activity levels, and may also facilitate the identification of scheduled activities that may be effective in reducing depressed behavior and increasing nondepressed behavior despite the experience of such events. If possible, direct functional assessment of the client's behavior in natural settings would be ideal. However, indirect functional assessments would also provide important information regarding the antecedents and consequences that may currently maintain the client's depression, as well as environmental variables that may facilitate or restrict engagement in scheduled activities. Such informant assessments (e.g., behavioral interviews and rating scales) have been frequently used in behavior-analytic research and practice (Lennox & Miltenberger, 1989). Obtaining information about the client's depressed behavior and activity engagement from multiple informants, including the client and other individuals with whom the client has frequent contact, would help to increase the reliability of indirect assessments.

In addition to overt behaviors, affective responses, and private events, behavior analysts could examine the effects of behavioral activation on the verbal behavior of older individuals with depression. For instance, rumination may be negatively reinforced through decreased or avoided engagement with the current environment (Kanter et al., 2008), and self-critical verbal statements may be positively reinforced with sympathetic social attention (Dougher & Hackbert, 2000). However, these verbal processes are likely to increase depression in the long term by reducing opportunities for engagement in positively reinforced healthy behaviors, and they may also result in social avoidance by

others (Biglan, 1991), which could further contribute to depression maintenance. The effects of behavioral activation interventions on these processes, with or without the use of planned contingency-management procedures, could yield important information. For example, in accordance with the matching law, as the relative value of positive reinforcement for healthy behavior (e.g., activity engagement) increases, self-critical verbalizations may decrease as a result of an increased availability of positive reinforcement for alternative behaviors.

Behavior analysts could also examine the potential role of establishing operations during behavioral activation. For instance, antecedent events such as prompts to engage in an activity (Brenske, Rudrud, Schulze, & Rapp, 2008; Engelman, Altus, & Mathews, 1999), activity prompts that include positive social attention (Polenick & Flora, 2011), or the presentation of activity materials in a salient location may momentarily establish the reinforcing effectiveness of activity engagement or social interaction, and may evoke behaviors associated with these events (Michael, 1993). Positive staff engagement has been significantly correlated with levels of interest, pleasure, and participation during activities for older nursing home residents (Meeks & Looney, 2011); thus, the social engagement of caregivers or family members may further increase activity participation and enjoyment. Embedding choice-making opportunities (Fisher, Thompson, Piazza, Crosland, & Gotjen, 1997) within activity scheduling is another area for exploration, in that this may increase the reinforcement value of activities. These strategies may help to maintain activity engagement; therefore, they may enhance both treatment adherence and effectiveness.

Finally, behavior analysts could determine the most effective means of training non-mental-health professionals to implement behavioral activation. Because older adults may be unlikely to seek mental health services or may experience barriers to mental health care (e.g., cost, lack of transportation, and limited mobility; Weinberger et al., 2009), individuals such as nurses, home care workers, residential care staff, and family members may be most likely to be in a position to both recognize depression and assist in facilitating environmental changes that could result in long-term improvements. Maintenance plans that prepare for eventual independent implementation will be essential. Development of ways to empower these individuals with simple, cost-effective intervention strategies may increase accessibility to depression treatment, which may provide lasting benefits for the health and well-being of older adults with depression. Thus, this may be a particularly needed application of behavioral activation for LLD.

The theoretical and practical considerations discussed in this paper suggest that the examination of behavioral activation interventions for LLD is a natural fit for behavior analysts. Admittedly, the complexity of behavior–environment interactions associated with LLD, along with the gap between mainstream medical models and behavioral models, present considerable obstacles. However, we hope that the behavior-analytic community will choose to meet and embrace these challenges. In addition to making substantial contributions to the knowledge base related to behavioral theories and treatments for depression, behavior analysts can contribute their specialized skills to ameliorate a major public health concern that has numerous detrimental consequences on the health, functioning, and quality of life of older individuals and their families, a goal of unquestionably high value and social significance.

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