Behavioral Gerontology

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Global and national demographics have shifted steadily towards an older population with adults 65 years or older projected to account for 20% of the total U.S. population by the year 2030 (APA Working Group on the Older Adult, 1998). The group aged 85 and older, referred to by researchers as the oldest-old, is growing faster than any other demographic group, with a disproportionate increase for women and minority groups (APA-WGOA, 1998; Belsky, 1999). These adults will need a range of medical and psychological services because they are likely to experience increased health conditions, sensory deficits, and cognitive impairments that are costly, debilitating, and potentially socially isolating (Belsky, 1999). However, the infrastructure for providing these services is projected to be woefully inadequate as “baby boomers” age and demand alternatives to traditional palliative care nursing environments (Molinari et al., 2003). As a result of the growing discrepancy between needs, infrastructure, and research base, enormous research and practice opportunities exist for psychologists interested in working with older adults.

“Behavioral gerontology” refers to the application of behavior analysis and therapy to older adults ranging from basic behavioral research to clinical applications to organizational issues in service delivery agencies (Adkins & Mathews, 1999; Burgio & Burgio, 1986). Behavior analysts have long advocated the use of behavioral interventions and environmental modifications to enhance the lives of older adults (Lindsay, 1964). Prominent behavior analysts have suggested that natural contingencies for older adults support ineffective behavior (Skinner, 1983) and that basic operant principles readily account for aging-related phenomena and for experimental evidence that many skills declines in older adults are reversible (Baltes & Barton, 1977).

Several reviews, book chapters, and handbooks published in the 1970s and 1980s documented the early interest in behavioral gerontology (Baltes & Barton, 1977; Lewinsohn, Teri, & Hartzinger, 1984; Patterson & Jackson, 1981; Wisocki, 1984). In spite of this early growth, many prominent psychologists lament the failure of psychology and the subfield of behavior
analysis to sufficiently learn about the aging process, disseminate acquired knowledge, and directly improve the lives of older adults (Carstensen, 1988; Storandt, 1983). Burgio and Burgio (1986) commented that behavioral gerontology had enormous potential for positive social impact but interest in the field waned and publications were infrequent. Carstenson (1988) echoed these sentiments and advocated for clinical behavioral research with older adults but identified practical concerns (e.g., difficulty finding appropriate and receptive non-aging outlets) as barriers that might lead many to abandon work in the area.

Since the mid-80’s a small stable number of publications on aging has appeared in behavioral journals while behavioral gerontologists have increasingly published works in multidisciplinary aging journals (Altus, Engelman, & Mathews, 2002a, Altus, Engelman, & Mathews, 2002b; Burgio et al., 2002; Hussian & Brown, 1987). These and other publications have attempted to illustrate for non-behavioral audiences the advantages of a behavioral approach to aging. These benefits include avoidance of ageism and focus on environmental factors that promote or suppress behavior, belief in the potential reversibility of decline, and cost-effectiveness and consistency in treatment approach (Dupree & Schonfeld, 1998). This chapter provides a review of the literature on behavioral gerontology from all of these publication sources for behavior analysts who may not be familiar with the area. The chapter is organized in three main content areas (basic research, clinical application, organizational application) with an emphasis on studies published in the past 20 years.

Basic Behavior Analytic Research on Aging

Basic research on aging has been dominated by the study of memory and cognition from an information processing perspective (Birren & Schaie, 2001; Cherry & Smith, 1998) with very little published literature from a behavior analytic perspective. Derenne and Baron (2002) identify basic research as the area of largest disparity between traditional and behavior-analytic study of
aging. The behavior analytic experimental literature on aging is small and focuses primarily on age related changes in classically conditioned responses, response to schedules of reinforcement, signal detection, and formation of stimulus equivalence classes. A few of the most consistent findings are briefly summarized below. Additional research is needed in each of these areas to clarify conflicting findings and to explore the parameters of age-related differences in performance.

A series of studies have documented clear age and dementia related changes in classically conditioned responses. Durkin, Prescott, Furchgott, Cantor, and Powell (1993) documented that two older groups (i.e., 50-63, 66-78) showed impaired acquisition of classically conditioned eye-blink and heart-rate responses compared to two younger groups but greater conditioning than a no-trials control group. Changes in classically conditioned response acquisition appear in later middle age and progress into old age (Woodruff-Pak & Thompson, 1988; Woodruff-Pak & Jaeger, 1998; Finkbiner & Woodruff-Pak, 1991) with even greater changes observed for individuals with dementia. Conditioned eye-blink responses reliably differentiate typically aging individuals from those with cerebrovascular dementia and those with dementia - probable Alzheimer’s type (Woodruff-Pak, 2001; Woodruff-Pak, Papke, Romano, & Li, 1996).

Several studies have examined age related sensitivity to reinforcement with somewhat mixed findings. Fisher and Noll (1996) compared discriminations of young and old subjects between concurrent variable interval schedules using a two choice operant task and found slower initial acquisition for older individuals but improved responding with increased exposure to reinforcement contingencies. Tripp and Alsop (1999) compared children, young adults, and older adults on a signal detection task requiring discrimination between two pattern types under various ratio schedules. Older adults demonstrated the slowest reaction times and the lowest bias toward the higher ratio stimuli suggesting decreased sensitivity to frequency of reinforcement. Plaud,
Plaud, and von Duvillard (1999) found slightly different results when investigating the responding of older adults on a computer-based task in which reinforcement magnitude was manipulated (i.e., 1 token vs. 10 tokens; identical schedules) for two possible responses. When the schedules were subsequently changed, older adults altered their responding accordingly indicating that they were sensitive to changes in schedules of reinforcement. However, they also demonstrated a bias toward the response with a history of higher magnitude of reinforcement as would be predicted by behavioral momentum theory. Their pattern of responding was very similar to that of college students in previous studies with the exception that a greater number of older adults demonstrated persisting response bias (i.e., resistance to extinction) even when contingencies were changed.

Two studies have examined the performance of older and younger adults in stimulus equivalence preparations and found generally weaker formation of equivalence classes for older adults. Wilson and Milan (1995) compared groups of older and younger adults and found slower response times and poorer performance on post-tests of equivalence relations for older adults. Perez-Gonzalez and Moreno-Sierra (1999) used single subject analysis to examine equivalence class formation and found slightly better but still impaired formation of equivalence classes in older adults.

Clinical Applications in Behavioral Gerontology

Clinical behavioral gerontologists have focused primarily on mental health problems (e.g., depression), health maintenance, and various problems associated with dementia. In each area, the medical rather than psychosocial model has been dominant perhaps because 85% of older individuals have health concerns warranting regular medical visits (Butler, Finkel, Lewis, Sherman, & Sutherland, 1992) while few older adults have regular contact with psychological professionals (Belsky, 1999). Though the medical model is dominant, evidence exists in each of these areas for the principle of dynamic interdependence (i.e., person and environment interact
reciprocally) and that change in the environment can produce change in behavior even when medical options cannot alter physical or cognitive status. The effectiveness of behavioral interventions in each area is reviewed below.

*Mental Health Problems: Depression and Anxiety*

Depression and anxiety are common mental health problems for older adults (Sorocco, Kinoshita, & Gallagher-Thompson, 2005) that often go undetected due to differing presentation in older adults (i.e., less report of sadness), high co-morbidity, and assumptions that organic rather than psychosocial conditions account for diagnostic indicators such as sleep problems, fatigue, inactivity or agitation (APA, 1998; Zarit & Zarit, 1998). Depression is characterized by sadness, feelings of worthlessness and guilt, lethargy, sleep and appetite disturbances, and loss of interest in activities. Major depression occurs in 1-6% of community dwelling older adults (Mojtabai & Olfson, 2004), 10-15% of medically ill or frail individuals (Dick & Gallagher-Thompson, 1996), and 30% of individuals with dementia (Zarit & Zarit, 1998). An additional 9-30% of community dwelling elders report sub-threshold symptoms that significantly impact quality of life (Blazer, 1993; Thompson, Futterman, & Gallagher, 1988). Generalized anxiety disorder (GAD), the most common anxiety disorder, occurs in approximately 3-17% of older adults and is characterized by worry (Ladouceur, Leger, Duga, & Freeston, 2004; Stein, 2004) with sub-threshold anxiety symptoms occurring for an additional 15-43% of healthy older adults (Mehta et al., 2003).

Cognitive behavior therapy (CBT) is an empirically supported intervention for both depression and anxiety for older adults (Arean, 2004; Stanley, Diefenbach, & Hopko, 2004) with evidence for individually administered CBT (Arean, 2004; Gallagher-Thompson & Thompson, 1996) and group-based CBT (DeVries & Coon, 2002). CBT generally involves education about depression/anxiety, self-monitoring of negative or anxious thoughts and emotion states, replacement of dysfunctional beliefs and self-statement with functional ones, scheduling of
pleasant events, and skills training (e.g., problem solving, coping, relaxation; Dick & Gallagher-Thompson, 1996; Dick, Gallagher-Thompson, & Thompson, 1996; Gatz et al., 1998). Several appealing features of CBT are the brevity and structure of interventions (Dick et al., 1996; Secker, Kazantzis, & Pachana, 2004), the availability of therapist manuals to guide treatment (Stanley et al., 2004) and the general acceptability of the intervention to elder consumers (Zeiss & Breckenridge, 1997). Recently, modifications to CBT make it especially suitable for older adults including altered use of homework (Kazantzis, Pachana, & Secker, 2003) and enhancement with learning and memory aids (Mohoman et al., 2003).

Several recent studies illustrate the benefits of CBT over therapeutic-contact control groups, non-specific therapies, and desiprimine. Stanley and Novi (2000) reviewed the effects of CBT for generalized anxiety disorder (GAD) in older adults. They identified 6 controlled-group comparisons and found relaxation training, cognitive restructuring, and multi-component CBT interventions superior to a wait list control. In a subsequent empirical study, Stanley et al. (2003) compared CBT to weekly phone contact and found significantly better improvement in reported worry and anxiety, depressive symptoms, and improvement in quality of life with CBT with most gains maintained at a year. Barrowclough et al. (2001) compared weekly in-home CBT to in-home supportive counseling and found improvement with both and greater improvement and better maintenance for the CBT group. Finally, Thompson, Coon, Gallagher-Thompson, Somer, and Koin (2001) found that CBT alone and CBT plus desiprimine were equally effective for depressed older adults and were superior to desiprimine alone. The combined therapy was most effective for patients who were more severely depressed.

**Health Maintenance: Diet, Hydration, and Continence**

Compliance with health or medication recommendations is referred to as treatment regimen adherence and the degree of compliance is typically a primary determinant of overall
health status (Meichenbaum & Turk, 1987). Nonadherence estimates for medication regimens by older adults range from 43-62% (Meichenbaum & Turk, 1987) even with education and the threat of dire consequences such as blindness or death. Recommendations involving lifestyle change and long-term risk produce the poorest adherence in spite of their potential for long-term improvement in quality of life. For example, poor diet and dehydration contribute to risk for cancer, diabetes, and heart disease, delerium, urinary tract infections, and medication toxicity (Ho, Lee, & Meyskens, 1991; Kannel, 1986; Sanservo, 1997; Warren et al., 1994). Yet older adults who are particularly susceptible to these problems consistently show little to no change in compliance with psycho-education (Sands & Holman, 1985). However, other interventions involving prompts and behavioral contingencies for diet and hydration have proven effective.

Stock and Milan (1993) compared the effects of two behavioral intervention packages on dietary practices of elderly adults in a retirement community. Baseline involved prompts (i.e., identification of healthy selections) while the first intervention involved enhanced prompts (e.g., media, buttons, verbal reminders) with feedback (i.e., graphed percentage of healthy items) and praise upon report of a personal selection. The second intervention incorporated a token-based lottery system with immediate and delayed reinforcers contingent upon healthy selections. The first intervention increased healthy selections from a baseline mean of 24% to 65% with marginal increase (68% healthy selections) with the addition of the lottery, and diminished effects upon return to the baseline condition.

Prompt systems have proven effective in increasing healthy fluid consumption for older adult in nursing homes but no studies have targeted community-dwelling elders. Spangler, Risley, and Bilyew (1984) had nursing aides present a cup and offer nursing home residents a choice of beverages every 1.5 hours resulting in clinically and statistically significant improvements in urine specific gravity measures of hydration. Simmons, Alessi, and Schnelle (2001) manipulated the
frequency of systematic prompts and beverage choices and found that 80% of nursing home residents increased their average daily fluid intake with systematic prompts alone. The addition of choice of beverage produced an additional 21% increase in fluid intake and a decrease in the number of beverage refusals.

Urinary incontinence becomes more common with age due to muscle weakness, decreased mobility, memory loss, and communication difficulties (Burgio & Locher, 1996). Older adults may restrict fluid intake in an effort to avoid accidents (Simmons et al., 2001) leading to dehydration and the related problems described above as well as potential social stigma and increased care requirements in nursing homes. Several interventions have proven effective in targeting incontinence, including psychoeducation/behavioral training, prompted voiding schedules, and the use of discriminative stimuli.

Behavioral continence training consists of education about mechanisms of bladder control and specific recommendations, in-session practice contracting and identifying relevant muscles, and assigned practice in contraction exercises (Burton, Pearce, Burgio, Engle, & Whitehead, 1988). This intervention produced an 82% reduction in incontinence compared to a 79% reduction for community dwelling participants in a behavioral training plus bladder-sphincter biofeedback condition. Burgio et al. (2002) replicated the comparison between behavioral training and biofeedback assisted behavioral training and also found equal reductions (69% and 63%, respectively) compared to a 58% reduction for participants in a self-administered procedure based on written instructions. These studies indicate that relatively brief behavioral training is sufficient to produce substantial reductions in incontinence without the need for biofeedback.

Two alternative interventions have proven promising for individuals residing in nursing home facilities. Prompted voiding schedules involve education, scheduled restroom visits with assistance, positive reinforcement for dry intervals and continent voids, and encouragement to
resist urinary urges between scheduled visits (Fantl, Wyman, Harkins, & Hadley, 1990; Jeffcoate, 1961). According to Fantl et al. the scheduled visits should begin at either a 30-minute or 60-minute interval and increase by 30 minutes with each adjustment until the patient reaches a three-to four-hour interval with consistent dryness. In their review, Fantl et al. reported 47% to 100% increases in continence with this procedure, while Burgio, Engel, McCormick, Hawkins, & Scheve (1988) reported a 32% increase in continence using the same protocol.

Overdependence: Ambulation & Activities of Daily Living (ADLs)

Independent ambulation and self-care (i.e., grooming, bathing) result in less care demands, increased privacy, and enhanced quality of life; but naturally occurring contingencies in many residential care settings support dependence rather than independence (Baltes, 1988). Overdependence may result when well-meaning caregivers provide unnecessary levels of assistance (Engelman, Mathews, & Altus, 2002) in an effort to be helpful and protective or as a result of failure to recognize individual strengths when serving multiple elders. Caregivers may want to hasten the process if an elder proves slow in ambulating, dressing, or bathing or the caregiver may fear a fall or other injury if the elder operates independently (Engelman et al., 2002). Temporary injury or illness may lead to persistent over-assistance or limits to ambulation, which can increase risk of falls. Increased falls leads to further restriction in ambulation and self-care routines and activities that require standing or walking (Burgio, Westley, & Voss, 1989; Suzuki, Ohyama, Yamada, & Kanamori, 2002).

Several studies have demonstrated the benefits of targeting increased independence directly with non-labor intensive interventions that actually decrease staff effort while maintaining elder safety. Burgio, Burgio, Engel, and Tice (1986) increased elder ambulation by training nursing home staff to prompt ambulation and praise successively more independent ambulation (e.g., less staff assistance, no walker). All 8 participants increased independent ambulation with
immediate change for 6 who rarely walked independently prior to intervention though they had the physical capacity to do so. In a second study, Burgio, Westley, and Voss (1989) also used prompting and praise for increased ambulation with an added component of restriction of access to wheelchairs. Three wheelchair bound elders attending a day center program were restricted from wheelchair use by removing the chair upon arrival and returning it when they left for the afternoon. The combination of wheelchair restriction, prompting, and praise effectively increased ambulation for all 3 participants, with an increase from a mean of 4.05 meters walked per day in baseline to 88.48 meters during intervention.

Two studies illustrate the effects of training nursing home staff in the use of a simple system of least prompts (SLP) procedure (i.e., verbal, gestural, physical) in increasing independence in ADLs. Engelman et al. (2002) trained three staff in the SLP procedure using instruction, modeling, rehearsal and feedback. All participants were dependent on staff assistance completely in baseline but became more independent in intervention. One resident became completely independent with the procedure. In a second study, Engelman et al. (2003) investigated brief caregiver training in SLP to target independent dressing. Staff increased their use of prompts from a median of zero in baseline to a median of two during the intervention and increased their use of praise from .05% to 22%. Elders became more independent in dressing with no increase in the time required to complete the dressing routine.

Behavioral Disturbances Related to Dementia

Clinically significant behavioral disturbances occur in 50% of outpatient dementia clinic clients and 75% of nursing home patients. Problem behaviors are also the most common precipitating factor for institutionalization (O’Donnell et al., 1992; Plaud, Moberg, & Ferraro 1998). Behavioral excesses (e.g., aggression, wandering) are targeted more commonly for intervention than deficits because they are problematic for caregivers (Plaud et al.).
Pharmacological interventions are used to address behavioral disturbances (Carstensen & Fisher, 1991; Fisher & Swingen, 1997), however, behavioral problems often persist despite antipsychotic use with medication-induced risk of falls, extrapyramidal symptoms, sedation, and cognitive decline (Talerico, Evans, & Strumpf, 2002). Over-reliance on neuroleptic medications prompted creation of the Federal Nursing Home Reform Act, part of the Omnibus Budget Reconciliation Act of 1987 (VandenBos & DeLeon, 1998). OBRA ’87 stated that elders should be free of unnecessary and inappropriate physical and chemical restraints and prohibited medication use for behavior modification without prior attempts at less restrictive interventions such as behavioral interventions. Behavioral interventions have several advantages over pharmacological interventions in that they emphasize increasing functional repertoires and access to reinforcers, minimize the need for chemical or physical restraints, and do not decrease mobility of already compromised repertoires of individuals with diminished cognitive abilities (Fisher et al., 2000; Fisher & Swingen, 1997).

Behavioral interventions for problem behavior typically involve environmental modification or active skill building (Fisher, Harsin, & Hayden, 2000; Teri, 1996). Recent studies have focused on functional assessment of the environmental contingencies that function as a reinforcer for problem behavior and incorporation of that information into individualized function-based treatments. Function-based interventions typically involve direct manipulation of the environment to establish relevant discriminative stimuli, decrease the relevant establishing operations for problem behavior, or to provide the relevant reinforcers (e.g., social interactions, escape from aversive situations, sensory stimulation) independent of the occurrence of problem behavior (Carr, Coriaty, & Dozier, 2000).

Aggression. Up to 86% of individuals with dementia display physical aggression that can contribute to placement in long-term care facilities, use of chemical and physical restraints, and
caregiver burnout (Bourgeois, Schulz, & Burgio, 1996; Burgio & Bourgeois, 1992; Cohen-Mansfield, Marx, & Rosenthal, 1989; Cohen-Mansfield, Werner, Culpepper, Wolfson, & Bickel, 1996; Raskind, 1999). The most commonly identified function for aggression in elderly adults with dementia is escape from a situation perceived as threatening or unpleasant with common antecedents including task demands, verbal prompts, and physical contact by care providers during ADLs (Burgio & Bourgeois, 1992; Cohen-Mansfield et al., 1996; Fisher & Swingen, 1997; Patel & Hope, 1993). A recent study by Baker, Hanley, and Mathews (2006) illustrates the use of a function-based intervention for aggression associated with bathroom routines. Following a staff conducted functional analysis suggesting escape-maintained aggression during bathroom routines, noncontingent escape (NCE) resulted in near-zero levels of aggression.

Earlier studies using behavioral but non-functioned based interventions to manage aggression illustrate that punishment procedures may be used more commonly when no functional analysis is incorporated. Rosberger and MacLean (1983) used differential reinforcement and timeout to address the aggression of an elderly woman with dementia. Staff differentially praised appropriate interaction attempts while aggression resulted in removal from activities and physical restraint. Aggression occurred 3 to 16 times per day in baseline decreasing to near zero levels during intervention. Vaccaro (1988) used a multi-component behavioral intervention for aggression during 1-hour group activity sessions with 6 elderly adults. Tangibles and social praise were provided in a 10-minute DRO contingency. Aggression resulted in loss of the potential reinforcer as well as a verbal reprimand and a 10-minute time out during which the participant left the group and watched from a remote area. Aggression decreased from a baseline mean of 25.5 per hr to 7.8 per hr in intervention with simultaneous decrease in a generalization setting.

Wandering. Wandering is typically defined as excessive pacing without purpose or ambulation into unsafe areas with estimates ranging from 3-59% for all elderly adults (Burns,
Jacob, & Levy, 1990; Reisberg et al., 1987). Wandering occurs at all levels of cognitive impairment but is more common with greater impairment (Chenoweth & Spencer, 1986; Teri, Hughes, & Larson, 1990). It increases the likelihood of getting lost or injured, having conflict with others (i.e., entering others rooms), and losing a placement and presents serious health concerns due to excessive calorie expenditure, dehydration, and exposure to the elements (Cohen-Mansfield et al., 1996; Hussian, 1988). Simple environmental manipulations such as reducing clutter and locking doors that lead to unsafe areas (e.g., cleaning supplies) can insure a safe environment for wandering and minimize the likelihood of establishing an attention function because caregivers do not have to shift their attention suddenly to the elder following episodes of wandering (Peskind & Raskind, 1996). For example, Hussian and Davis (1985) used a stimulus control procedure to teach 3 dementia patients to wander only in safe areas by pairing different colored stimuli with specific consequences in relevant areas (i.e., orange/safe = food reinforcer; blue/unsafe = loud aversive noise). Posting the colored stimuli successfully decreased wandering into inappropriate areas.

When secure wander areas are not feasible, alternative environmental interventions such as visual barriers and Wanderguards® may prove beneficial. Visual barriers operate on the premise that many individuals with dementia perceive two-dimensional patterns as three-dimensional barriers without the need to create a real barrier (Hussian & Brown, 1987). Hussian and Brown effectively reduced exit-seeking with a simple grid of masking tape in front of doors. Namazi, Rosner, and Calkins (1989) used seven different visual barriers (e.g., cloth across a door handle, other doorknob patterns, various floor grid patterns) and found that cloth barriers were the most effective in preventing patients with Alzheimer’s Disease from existing through an emergency door. Feliciano, Vore, LeBlanc, and Baker (2004) effectively used a visual barrier and extinction to decrease client entry into a staff office area with safety hazards. Wanderguards® are small
transponders worn by the elder that emit an alarm when an individual attempts to exit a door. The alarm may function as an aversive stimulus punishing the behavior of approaching the door and establishing the door as a discriminative stimulus for punishment. However, the alarm may result in a shift to monitoring and interaction following the alarm rather than continuous monitoring, which could result in attention-maintained wandering if the right establishing operations are in effect.

Common behavioral functions of wandering include access to or escape from sensory stimulation (e.g., sights, smells, sounds) and access to attention or preferred items (Cohen-Mansfield et al., 1996; Heard & Watson, 1999). One study has examined the function of wandering directly with subsequent development of function-based interventions. Heard and Watson (1999) conducted functional analyses that identified maintaining variables of attention for 2 participants, access to tangibles for 1 participant, and sensory stimulation for 1 participant. The relevant functional reinforcer then was incorporated in a DRO intervention for each participant with substantial reductions in time spent wandering.

**Disruptive Vocalizations.** Disruptive vocalizations refer to loud repetitive requests and self-talk, screaming, negative remarks, and use of obscenities (Cariaga, Burgio, Flynn, & Martin, 1991; Cohen-Mansfield, 1986). Unlike aggression and wandering, disruptive vocalizations pose no immediate threat to safety but produce constant irritation for caregivers that may lead to social isolation, nursing home placement, or chemical restraint (Burgio & Bourgeois, 1992). Conversely, moderate decreases in behavior often produce meaningful social impact by allowing prolonged community placement or eliminating the need for restraint because safety is not an issue. For example, Green, Linsk, and Pinkston (1986) taught spousal caregivers to reinforce appropriate statements socially and ignore inappropriate verbalizations for 2 elderly community-dwelling men
facing impending nursing home placement. The behavior change was sufficient to result in continued community placement and the effects were maintained at a 6-month follow-up.

Common functions of disruptive vocalizations are access to social attention and increased stimulation. Buchanan and Fisher (2002) illustrated the use of functional analysis of disruptive vocalizations and found that repetitive vocalizations in 2 elderly nursing home patients were attention maintained with a possible secondary function of increased stimulation. They effectively reduced the frequency of disruptive vocalizations using non-contingent presentation of the identified reinforcers (i.e., attention, music). Based on the possibility that disruptive vocalizations might provide increased stimulation for some individuals, Lund, Hill, Caserta, and Wright (1995) used interactive videotapes to provide an alternative source of stimulation. A “video respite” system was used on a large scale in 10 nursing home units with staff ratings indicating a decrease in both wandering and verbal agitation when using the videotapes. Similarly, Burgio, Scilley, Hardin, Hsu, and Yancey (1996) used two “white noise” audiotapes depicting soothing sounds to decrease verbal agitation in nursing home residents. The nursing home staff provided tape players and headphones with the tape identified as the most effective for that individual during periods of heightened verbal agitation producing an average reduction in verbal agitation of 23%. Providing access to the audiotapes contingent upon agitation could have lead to increases in agitation if white noise functioned as a reinforcer, but these results suggest that other unidentified behavioral processes (e.g., stimulus competition, punishment, etc.) were at work.

*Memory Problems.* Memory deficits are the hallmark feature of dementia and can lead to communication difficulties, social isolation, wandering, failure to take medication, and agitation (Golden & Chronopolous, 1998). Behavioral interventions for memory deficits typically involve use of memory aids, which are discriminative stimuli (i.e., pictorial, textual prompts) for increased independence and communication.
Several studies illustrate the use of simple memory aids with older adults with dementia. Nolan, Mathews, and Harrison (2001) placed portraits with large print nameplates in hallways to aid adults with dementia in finding their own rooms in a residential setting. Correct, independent room finding increased from a mean of 34% in baseline to 85% during this simple intervention. Bourgeois (1993) used memory aids to enhance conversational content and social skills in adults with dementia. Six individuals were placed into dyads and given memory aid wallets for one dyad member. The wallets included 18-35 pictures about their daily schedule, family, and other life facts. The memory aids increased on-topic and novel utterances for both members of three of four dyads. Though these memory aids are not technology based, electronic memory aids are becoming increasingly popular. Recently, Cohen-Mansfield et al. (2005) surveyed 100 healthy older adults about the use of electronic memory aids. Their results indicated that 58% of older adults would use an electronic memory aid for tasks such as personal self-care tasks, and reminders for medication, appointments and important dates and that they would like the device to be small and portable.

Disengagement. Inactivity or disengagement is common for residents in institutional settings and can lead to skill loss and increased risk for falls and other mental health problems (Suzuki et al., 2002). However, relatively simple behavioral interventions have proven effective in increasing levels of engagement of older adults in nursing homes (Altus et al., 2002a; Engelman, Altus, & Mathews, 1999; Jenkins, Felce, Lunt, & Powel, 1977). For example, Jenkins et al. increased engagement with a simple intervention of increased presentation of leisure materials and prompts for engagement. Staff presented a choice of four leisure activities several times during two-hour periods twice a day with praise and interaction contingent upon engagement. The number of participants in the lounge area tripled during intervention and the number of residents engaging in activities increased as well.
In two studies, Mathews and colleagues targeted engagement in nursing homes across several contexts. Engelman, Altus, and Mathews (1999) used a “resident check-in” procedure that required staff to make personal contact with each resident every 15 minutes, provide praise for specific behaviors, and offer a choice of at least two activities if a participant was not engaged. The check-in procedure increased appropriate engagement of 5 participants from 41% of intervals in baseline to 81% of intervals in intervention with a corresponding increase in the variety of activities. Altus, Engelman, and Mathews (2002b) targeted increased engagement in the form of participation and conversation during mealtime. “Family-style meal time” involved changing mealtime routines to enhance participants’ involvement and communication compared to the baseline procedure of prepared plates typical in nursing homes. The “family-style” meal presentation combined with staff prompts and praise for appropriate behaviors substantially increased participation from 10% to 65% of intervals and conversation from 5% to 18% of intervals.

Recently, Camp, Orsulic-Jeras, Lee, and Judge (2005) evaluated the effects of a Montessori-based intergenerational program on the engagement of adults with dementia using a crossover group design. The program consisted of 20-minute sessions in which dyads of adults aged 50-95 with a diagnosis of dementia and children aged 2.5-5 years worked on Montessori activities. Results indicated that the adult participants showed increases in constructive engagement and pleasure as well as decreases in passive engagement (e.g., watching) and non-engagement.

Organizational Applications

Behavioral interventions are clearly useful for a variety of clinical issues faced by older adults but residential settings often have organizational characteristics that greatly decrease the likelihood of effective use of behavioral interventions. First, functional analyses and individual
behavioral interventions can be cumbersome because long-term care facilities often have such poor staff-client ratios (Harrington, 2001). An employee is responsible for the basic safety, health, and personal care of six to eight individuals during a shift. Any new job duties must fit in with primary care activities (e.g., feeding, toileting, transporting) without substantially increasing work requirements or time constraints. Second, people who directly interact with older adults often are unfamiliar with behavioral procedures. Approximately 80-90% of a nursing home resident’s contact occurs with certified nursing assistant (CNA) staff (Burgio et al., 2002) that are familiar with the medical model but have little exposure to behavior analysis. Consequently, CNAs need training in basic principles as well as consistent implementation of behavioral interventions and data collection procedures. Third, frequent staff turnover means that training must be nearly constant to ensure consistency across staff and a culture shift toward proactive behavioral strategies.

Consistency of implementation is critical because the positive effects of behavioral interventions with individuals with dementia are often only evident when the intervention is in place and accurately implemented with immediate relapse when interventions are removed. Several studies illustrate that independence and skill use that emerged when one person implemented an intervention were not evident with other staff until they used the interventions as well. Mathews and Altus (1997) and Engelman et al. (2002) taught CNAs to use SLP to increase independence in elderly adults. Increased independence in dressing occurred during intervention with a specific CNA but the effects did not occur with other CNAs until they were explicitly taught to use the intervention and used it consistently. Burgio et al. (2002) increased continence using prompted voiding schedules on a specialty care unit but found that continence gains did not maintain when individuals returned to a general care unit. All staff had to be trained to implement
schedules consistently. Thus, effective training using a well-structured systems-wide program with regular practice, feedback and supervision is imperative.

Typical staff training in nursing home settings consists of didactic instruction during a one-day workshop or in-service (Burgio, 1991; Burgio & Burgio, 1990) with 85% of training lasting 1 hour and occurring during or between shifts (Wieland, Wendland, & DeRyke, 1992). Even though lecture or didactic instruction is common, more effective training systems have been established and commonly are used in business settings and other organizational systems. Strategies such as explicit practice with feedback, off-site education, career development, and incentive systems are becoming increasingly popular methods of successful staff training in businesses (Wieland, Wendland, & DeRyke, 1992). Many of these same strategies have been used successfully in long term care for individuals with developmental disabilities but have not been fully incorporated into mainstream nursing home care presenting an enormous dissemination need and opportunity (Burgio, 1991).

Recently, behavioral gerontologists have incorporated effective training and systems management strategies in nursing home settings. For example, Burgio et al. (2002) compared formal staff management (i.e., self-monitoring, feedback, incentives) and conventional staff management (i.e., status quo supervision without feedback or incentives) for maintenance of previously trained behavioral skills in CNA’s. Formal staff management resulted in better skill maintenance than conventional management. Other studies have examined training and feedback strategies when investigating increasing engagement, increasing independence, and increasing continence (Engelman et al., 1999; 2002; 2003) with positive effects.

Summary and Conclusions

Behavioral gerontology has enormous potential for positive social impact; however, several prominent behavior analysts have suggested that behavioral gerontology has not flourished
as a subfield (Burgio & Burgio, 1986; Carstensen, 1988) and has not explored all potential applications of behavior analysis to aging fully (Derenne & Baron, 2002). As an example, there have been relatively few functional analysis studies with elders with dementia compared to the thriving literature on functional analysis with individuals with developmental disabilities (Hanley, Iwata, & McCord, 2003), even though elders with dementia are just as likely to have troublesome behaviors. Behavior analysts interested in aging have almost unlimited potential for research and clinical opportunity due to the growing demand for a range of services by older adults.

Additional basic human operant studies are needed for virtually every aspect of responding that might be impacted by age related changes in human functioning. In the applied area, more studies are needed that incorporate functional assessment and address health and mental health issues in community dwelling elders. Additionally, future applied studies in residential settings must focus on incorporation of electronic technology and organizational strategies to improve overall efficiency and effectiveness of service delivery. Behavior analysts must continue to publish studies in aging journals and journals specific to other disciplines (e.g., nursing, occupational therapy) in order to introduce these groups to the benefits of the behavioral approach. However, behavior analysts also must continue to publish enough studies on behavioral gerontology in flagship behavior analytic outlets to ensure that new behavior analysts become interested in the field.
References


