The theoretical and conceptual basis for behavior analysis emerged from the fields of experimental psychology, physiology, and philosophy, effectively melding theory with scientific rigor. Behavior analysis has since expanded from controlled laboratories into applied settings, including hospitals, clinics, schools, family homes, and communities. Much of the early research in applied behavior analysis (ABA) included participants with mental health disorders and developmental disabilities. ABA research for persons with developmental disabilities is vibrant and expansive; however, there is a paucity of recent research in behavior analytic assessment and treatment for persons with mental health diagnoses. This article describes how ABA technology can advance mental health services for children and adults utilizing a multidisciplinary approach to link professionals from psychology, psychiatry, and other associated disciplines to optimize patient outcomes. Discussion focuses on historic applications of behavior analysis, opportunities, and barriers in the mental health field, and ways in which ABA can contribute to a multidisciplinary treatment approach.

Keywords: applied behavior analysis, functional behavior assessment, functional analysis, contingency management, acceptance and commitment therapy

The etiology of mental illness is believed to be a complex interaction between genetics, physiology, neurobiology, and environmental factors that lead to psychological, physiological, and/or behavioral changes. When these deviations differ significantly from societal norms and interfere with one’s ability to function in daily life, the person may be diagnosed with a mental disorder (American Psychiatric Association, 2000). Often a licensed physician, psychiatrist, or psychologist assesses an individual, diagnoses a mental disorder, and then designates a treatment plan for that individual. Although an interdisciplinary approach, wherein representatives from various disciplines such as medicine, psychiatry, clinical psychology, neuroscience, education, social work, and behavior analysis convene to devise a treatment plan would be preferable, the logistics and resources required limit this practice to select clinical facilities. We posit that behavior analysis, which includes refined techniques for teaching and motivating adaptive behavior, should be an integral part of a multidisciplinary approach to mental health services. Combining technologies derived from behavior analysis and other disciplines could broaden our understanding of mental disorders, expand the range of available interventions, and improve therapeutic outcomes and client satisfaction.

This article briefly examines early applied behavior analysis (ABA) research with mental disorders, the development of functional behavior assessment and functional analysis of behavior problems, potential contributions of ABA to multidisciplinary mental health services, and recent ABA studies with mental disorders in children and adults. While covering these topics, the present article highlights some of ABA’s technological developments within mental health services and special challenges it has faced.
Evolution of Mental Health Treatment and Behavior Analysis

The treatment of individuals with mental illness changed dramatically during the 20th century as custodial arrangements progressed to a mix of educative and therapeutic programs within mental hospitals, outpatient clinics, and community-based facilities (Braddock & Parish, 2002). The use of psychosurgery and electroconvulsive shock therapy decreased as pharmacology became the treatment of choice for many mental health impairments (Braddock & Parish, 2002; Wong, 2006). A parallel change has been occurring within the field of behavior analysis as its investigations have extended from basic research with nonhuman animals in laboratories to improving socially significant behavior of humans in applied settings (Baer, Wolf, & Risley, 1968, 1987).

Much of the early research within the field of ABA was conducted within state mental hospitals using operant procedures such as token economies, reinforcement procedures, shaping, and extinction for persons with severe mental disorders such as schizophrenia (Ayllon & Azrin, 1965; Ayllon & Haughton, 1964; Ayllon & Michael, 1959). Over the last 50 years, behavior analysis has been successfully applied in mental institutions and community-based facilities to increase social, self-care, vocational, leisure, and recreational skills while concurrently reducing behavioral problems such as delusional speech, bizarre behavior, and aggression (Wong, 1996; Wong, Wilder, Schock, & Clay, 2004). Despite beneficial outcomes, behavior analysis has been successfully applied in mental institutions and community-based facilities to increase social, self-care, vocational, leisure, and recreational skills while concurrently reducing behavioral problems such as delusional speech, bizarre behavior, and aggression (Wong, 1996; Wong, Wilder, Schock, & Clay, 2004). Despite beneficial outcomes, behavior analytic techniques are often underused or supplanted by interventions with limited scientific support (Scotti, Morris, McNeil, & Hawkins, 1996; Wong, 2006). The enhanced prognostic and therapeutic outcomes associated with ABA indicate that this approach could contribute much to the treatment of clients with mental health disorders.

A central premise of ABA is that focusing on observable behaviors provides an objective and empirically based framework for the assessment and treatment of mental disorders (Scotti et al., 1996; Wong, 1996). By concentrating on behavioral manifestations of mental disorders clinicians can obtain specific and independently verifiable measures of clients’ problems. This method can also facilitate the discovery of functional relations between overt behavior and environmental stimuli, leading to interventions that reengineer aspects of clients’ social and physical surroundings. Assessment of mental health problems is complicated by reliance on self-reports of mental states, often evaluating covert behaviors and unobservable events. Interpreting the roles of mental events and behavioral sequela are a challenging endeavor with multiple confounding variables that must be controlled or ruled out during the course of treatment (MacCorquodale & Meehl, 1948). For example, it can often be difficult to disentangle the sedating and enervating effects of medications from the symptoms of a mental disorder, such as the negative symptoms of schizophrenia (Wildner & Wong, 2007). Current ABA research with mental health disorders uses mixed assessment methods, employing direct observation of overt behaviors as well as interview, questionnaire, and other self-report measures of covert behavior and internal processes to overcome the limitations of singular assessment procedures.

Functional Behavioral Assessment and Functional Analysis

Functional analysis and functional assessment arose out of research treating self-injury, aggression, and disruptive behavior in persons with developmental disabilities (Carr, 1977; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). This line of research differed from prior forms of applied behavior analysis in its intensive efforts to isolate specific consequences maintaining problem behavior (Hanley, Iwata, & McCord, 2003). Interventions that identify and alter consequences maintaining a “targeted” behavior (e.g., determining that a client engages in verbal aggression to escape work demands) are more effective and may have better long-term outcomes than interventions that treat the problem by simply administering arbitrary reinforcers (Ingram, Lewis-Palmer, & Sugai, 2005).

Functional Behavior Assessment (FBA)

Behavior assessment entails descriptive and/or indirect observational techniques to investigate hypotheses about the factors that predict and maintain behavior. Questionnaires, checklists, interviews, and observational data
are scrutinized to identify: motivating operations (i.e., stimuli that alter the effectiveness of consequences and/or alter the frequency of behavior through their effect on consequences), antecedents (i.e., stimuli that reliably predict when reinforcers, punishers, or neutral stimuli will follow a behavior), behavior (i.e., an operational definition of an organism’s interaction with the environment), and consequences (i.e., a stimulus change that follows a behavior of interest). Hypotheses about environmental stimuli thought to educe and maintain problem behavior are incorporated in the client’s treatment plan, which subsequently attempts to dismantle problematic contingencies and erect contingencies that reinforce adaptive responses. Diminishing the impact of motivating operations and/or decreasing the frequency of behavioral cycles through antecedent manipulations often makes the relation between targeted behavior and antecedents ineffective or irrelevant. For example, emotional outbursts that arise when a client is asked to perform a certain task might be diminished by making the task easier and less time-consuming to perform, or by making the task more interesting and enjoyable to do.

**Functional Analysis**

Researchers and clinicians use functional analysis to empirically determine which contingencies maintain the problem behavior. Using a series of brief sessions (5 to 15 min), therapists or confederates respond in a scripted manner (e.g., problem behavior produces either escape from demands, staff attention, or no consequences) to simulate the various contingencies being investigated (e.g., contingent escape, contingent attention, opportunity to be left alone). These analog conditions are systematically presented to observe under which conditions the targeted behavior most often occurs. The systematic manipulations used during functional analysis allow investigators to determine any functional relation between environmental stimuli and target behaviors (Hanley et al., 2003).

**Integration of ABA Into a Multidisciplinary Model**

Behavior analytic methodology can be an invaluable tool for multidisciplinary practice above and beyond its ability to reveal environment-behavior relation. Operational definitions, repeated measures, and within-subject designs can be used to evaluate subtle effects of pharmacological interventions on individual clients, such as dose-response relations and drug-behavior interactions (Poling & Ehrhardt, 1999). This methodology can also be utilized to examine behavior that originates from medical conditions but persists as a result of social contingencies (e.g., symptoms and complaints about an illness that continue because of attention from family members). Psychiatry may benefit from a hypothesis driven prescriptive model that differentiates between pharmacological agents, within a given drug class, based on the function of targeted behaviors (Roberts et al., 2008). Although translational research is needed, Roberts and colleagues (2008) demonstrated that antiepileptic drugs showed differential effectiveness for behaviors maintained by either positive or negative reinforcement (i.e., social attention vs. escape from aversive stimulation).

Behavior is indeed the product of complex neurochemical processes, but the behavior-environment interaction should not be overlooked. Scotti and colleagues (1996) described an integrated diagnostic system using functional analysis to augment the Diagnostic and Statistical Manual of Mental Disorders (DSM) classification system, theoretically providing clinicians with a seamless process of classification and support development. Additional research is needed to identify the most efficacious means of integrating ABA within a multidisciplinary approach to mental disorders (Hemmings, 2007), but years of research support the amalgamation of ABA with other evidence-based practices (Poling & Ehrhardt, 1999; Scotti et al., 1996).

As demonstrated by over 50 years of scientific research, behavior analytic techniques (e.g., reinforcement, FBA, functional analysis) offer empirically validated, evidence-based practices for clinicians and researchers working in mental health services. Behavior analysis has shown utility within institutions and across community settings, and it complements the work of other mental health disciplines. The following sections discuss the use of behavioral treatment with children and adults who have mental health issues and present case
examples to illustrate the effectiveness of merging behavioral techniques into a multidisciplinary approach to mental health.

**Children’s Mental Health Issues**

Predominate children’s mental health issues include attention-deficit/hyperactivity disorder (ADHD), obsessive–compulsive disorder (OCD), Tourette’s syndrome (TS), and other clinical conditions categorized as anxiety and mood disorders (American Psychiatric Association, 2000). Although ABA has a rich tradition with children who have developmental disabilities (Matson, Laud, & Matson, 2004), there are fewer applications among those with psychiatric disorders. Explaining this difference, Woods, Miltenberger, and Carr (2006) noted that ABA did not evolve from clinical psychology but instead, “out of experimental psychology laboratories and from settings to which this early laboratory work was first extended for applied purposes” (p. 408). They commented further that ABA relies on measurement of observable behavior and not “private” (covert) events that cannot be detected but constitute key symptoms of many disorders. One additional concern is that many children with mental health issues are treated in outpatient settings where it usually is more difficult to establish experimental control compared to the institutional environments that dominate ABA research.

Documentation of “target” behaviors is a defining characteristic of ABA. Therefore, it is critical to measure the clinical problems that children display as the result of a mental health issue. Various data sources are used to establish a pretreatment baseline and subsequently to verify whether treatment is effective or should be revised in favor of alternative methods. Examples of behavior-specific frequency measures are the number of words spoken by a child with selective mutism (Schill, Kratochwill, & Gardner, 1996), the number of tics displayed by a child with TS (Woods & Luiselli, 2007), and the number of hair-pulling responses by a child with trichotillomania (Byrd, Richards, Hove, & Friman, 2002). Also, duration data can be recorded, such as the amount of time a child with a specific phobia spends in the presence of a feared object or situation (Ricciardi, Luiselli, & Camare, 2006). Finally, behavior analysts have been encouraged to consider self-report of anxiety, beliefs, and other cognitive manifestations as valid clinical indices and dependent measures to evaluate treatment effectiveness (Friman, Hayes, & Wilson, 1998).

An ABA orientation to children’s mental health issues emphasizes FBA as a prerequisite for treatment formulation. The purpose of conducting a FBA is to identify situations that influence clinical presentation, and in turn can be manipulated therapeutically. For example, stressful interactions and intrusive sensations can exacerbate vocal and motor tics in children with TS (Leckman, King, & Cohen, 1999). One FBA approach would be asking the child with TS and significant others such as parents and teachers to list those situations most associated with tics, as well as situations in which tics rarely occur. Armed with such information, a clinician can select several treatment procedures that are “matched” to behavior function.

**Treatment of Children’s Mental Health Issues**

Regarding treatment of children’s mental health issues, ABA typically incorporates antecedent and consequence control procedures. Interventions may concentrate on triggers that set off the behavior, replacement behaviors, consequences that maintain problem behavior or adaptive behaviors, or a combination thereof. Multimodal intervention plans decrease the likelihood of problem behavior through antecedent manipulations, teach alternative prosocial behaviors that may be less stigmatizing, and provide interventionists with reactive strategies to deescalate clients who engage in problem behaviors.

**Antecedent Manipulations**

Interventions may adjust the antecedent conditions so that the contextual variables that set the occasion for a target behavior are eliminated and the adaptive replacement behavior is more likely to occur. As an example, a child with OCD who has checking rituals may experience heightened anxiety and negative thoughts that lead to compulsive actions and resulting anxiety relief. Eliminating these behavior provoking “prechecking” thoughts and feelings would be a
legitimate antecedent treatment strategy. Small environmental manipulations such as changing clinical environments from the austere may increase follow-up visits. Identification and amelioration of motivating operations may increase compliance to treatment regimes. For example, if a client’s sleep problem is identified and treated, the client would be more likely to attend counseling sessions as the reinforcing properties of avoiding group sessions are diminished.

Consequence Manipulations

Consequence variables are events and environmental interactions that follow a clinical problem. Often these behavior contingent consequences can be positively or negatively reinforcing so that the effect is to strengthen (maintain) the problem. In the previous example of a child with OCD, performing a checking ritual diminishes anxiety, thereby functioning as negative reinforcement. One focus of treatment in such a case would be eliminating this source of reinforcement, perhaps by teaching the child to resist performing a checking ritual and having a parent or therapist provide positive consequences as a reward for success (Wetterneck & Woods, 2006). Behavior analysis has identified several methods of preference assessment (e.g., Deleon & Iwata, 1996) which are easily be adapted to children with mental health issues, diminished cognitive capacity, and/or low speech production. For example, clinicians may use preference assessment results to reward dietary changes to help diminish the impact of constipation, a common side effect of pharmacological agents.

Case Study: Lucy

The combination of antecedent and consequence treatment procedures with data acquired through self-report and direct measurement is illustrated in a study by Whitton, Luiselli, and Donaldson (2006). The participant, Lucy, was a 7-year-old girl diagnosed with generalized anxiety disorder (GAD) and specific phobia that concerned fear of vomiting. Her developmental history was significant for excessive worry, chronic anxiety, and complaints of stomach discomfort. Because she feared vomiting, Lucy had significant eating inhibition and weight loss.

Following an initial intake session at a hospital-affiliated child clinic, several measures were recorded during a 2-week baseline phase and a 14-week course of treatment. Each day, Lucy’s mother documented the frequency of stomachache complaints and the duration of each episode. Maternal ratings of stomachache severity ranging from 0 (no signs of distress) to 10 (maximum signs of distress) also were scored based on observable behaviors such as perceived pain, crying, and clinging. Lucy completed the Trait Anxiety subscale of the State–Trait Anxiety Inventory for Children (STAIC-T; Spielberger, 1973) 1 week before initiating treatment (baseline), 1 week after terminating treatment, and 5 months after treatment. The Trait Anxiety subscale contains 20 self-report items that assess general anxiety-proneness and was used as a self-report measure to assess further Lucy’s response to treatment. One additional measure was Lucy’s body weight recorded by clinic nursing staff at baseline and approximately 3-week intervals during and following treatment.

Treatment with Lucy was implemented by a therapist in three phases during 14 weekly to biweekly sessions. Phase I emphasized psychoeducation about anxiety, how to recognize and label accurately physiological signs of distress, and how stopping anxiety early would prevent it from building. Sessions in Phase II featured training in behavioral coping skills through distraction and relaxation. Lucy was taught to employ distraction by performing an enjoyable activity when she was anxious or feared vomiting. She learned how to induce relaxation through simple breathing exercises and abbreviated muscle “calming.” In Phase III, treatment addressed cognitive coping strategies, including correcting misinterpretations of bodily sensations, challenging unrealistic automatic thoughts, and employing counterthoughts to replace anxiety provoking self-talk. The therapist also introduced graduated, imagined exposure by having Lucy visualize the onset of vomiting in a variety of social contexts and using coping strategies to reduce her level of distress.

Another component of treatment was having Lucy’s parents implement contingency management procedures to help her reduce anxiety and stomachache-related distress. They were trained in active ignoring of Lucy’s “attention seeking” maladaptive behaviors and were taught to identify
their own reactions that might reinforce the behaviors (e.g., talking at length with Lucy about the discomfort or “soothing” her). The therapist then guided them in creating an alternative plan for responding to Lucy’s complaints with simple prompts to use the coping strategies she had learned in therapy. To avoid inadvertent reinforcement of stomachaches at bedtime by attention from her father (who often talked with or read to Lucy at night if she was “sick”), periods of “father–daughter time” were scheduled each evening so that they were not contingent on Lucy’s reports of distress.

With treatment, Lucy showed significant clinical progress. Frequency of stomachaches ranged from 18 to 20 each week at baseline, but decreased steadily in response to treatment, with only 2 incidents reported during the final month of therapy sessions. The severity of stomachaches also decreased contemporaneously with the reduction in frequency. The average maternal rating of stomachache intensity was between 5.0 to 5.1 in the baseline phase and 1 or less by the end of treatment. Duration of stomachaches exceeded 500 min on average each week at baseline, decreased progressively during treatment, and occurred less than 10 min each week posttreatment. Lucy’s weight at the first week of the baseline phase was 41.2 pounds, and at her final treatment session she weighed 43 pounds. Her mother reported that as treatment progressed, Lucy began eating larger portions of food at all meals and no longer complained about “being full” or feared vomiting. A nurse’s report at the clinic indicated that the weight Lucy gained was appropriate for her age and the length of time. Finally, on the Trait Anxiety subscale of the STAIC-T, Lucy endorsed more anxiety than 34% of females her age before treatment, and 8% at posttreatment. At the last treatment session, her mother indicated that Lucy was less anxious in a variety of situations. For example, she explained how Lucy no longer expressed worry about being left with a babysitter in contrast to her usual increased anxiety anticipating this event.

The case report by Whitton et al. (2006) is an example of clinical behavior analysis, an emerging specialty within ABA that addresses traditional mental health problems (Woods et al., 2006). As it applies to children, clinical behavior analysis is practiced by psychologists, consultants, and other mental health professionals within office, hospital, and school settings. ABA is at the core of clinical behavior analysis, building on decades of research that has produced innovative assessment, treatment, and single-case evaluation procedures. The extension of ABA to children’s mental health issues represents a vibrant area of clinical inquiry and one that embraces collaboration with medical, psychiatric, and related disciplines.

Effective Strategies for Supporting Adults Who Have Mental Health Issues

The range of behavior analytic techniques and spectrum of mental health disorders to which they have been applied are too broad to be adequately covered in this article. A partial example of this is the successful treatment of muscle tics, nervous habits, and stuttering in outpatients by behavior analysts using awareness training and habit-reversal procedures (Miltenberger, Fuqua, & Woods, 1998). To give some sense of the breadth of behavior-analytic applications in mental health services for adults, we will briefly surmise the theoretical and therapeutic model emerging from operant learning research.

**Contingency Management**

Early ABA studies in mental health were direct applications of the operant paradigm modifying antecedent and consequent stimuli in the hospital environment to restore patients’ functional behaviors (Ayllon & Azrin, 1965, 1968) and to reduce psychotic responses (Ayllon, 1963; Ayllon & Michael, 1959). Contingency management programs were typically implemented by direct care staff who taught and strengthened adaptive behaviors, such as self-care and vocational skills, with verbal prompts, modeling, positive reinforcement (e.g., praise, tokens), and shaping through reinforcement of successive approximations. Hospital staff simultaneously decreased psychotic responses, such delusional speech and bizarre rituals, with extinction (e.g., planned ignoring) or mild punishment (e.g., token fines, brief timeout from reinforcement). Programs were usually evaluated by monitoring the frequency of target behaviors and replicating treatment effects within single-subject reversal or multiple-baseline designs.
The token economy is a group contingency management program that restructures the living environment to resemble an economic exchange system (Ayllon & Azrin, 1965, 1968). Desired performances in the setting are subclassified and defined (e.g., self-care tasks, household duties, and social interactions), and staff members dispense tokens to clients for performing these actions throughout the day. Tokens operate as conditioned reinforcement, or mediating stimuli, which clients can later exchange for primary and conditioned reinforcers in the form of snacks, grooming supplies, recreational items, preferred activities, and other sought-after goods. Individual contingency management programs are another therapeutic approach usually focused on idiosyncratic problems not adequately addressed by the group contingency program. Individual programs (e.g., utilizing personalized reinforcers, one-to-one training, or behavioral contracts) have been designed to improve a wide spectrum of inappropriate behaviors including physical intrusiveness, verbal and physical aggression, social isolation, and elective mutism, to name a few (Liberman, Wallace, Teigen, & Davis, 1974; Stahl & Leitenberg, 1976).

The effectiveness of individual contingency management programs have been demonstrated in scores of single-subject design studies (Wong et al., 2004), and the superior outcomes of token economy programs as compared to treatment-as-usual groups have been shown in about a dozen controlled within-subject and between-groups design studies (Dickerson, Tenhula, & Green-Paden, 2005). However, despite positive outcomes associated with these programs, the mental health systems in this country have consistently favored biomedical over learning-based interventions, relying heavily on psychotropic drugs whose limited therapeutic efficacy and serious health risks often go unrecognized (Wong, 2006).

Functional Analysis and FBA

FBA and functional analysis have begun to shape the design of behavioral interventions for severe mental disorders in adults. Schock, Clay, and Cipani (1998) presented a series of seven case studies utilizing functional assessments with clients diagnosed with schizophrenia who displayed delusional speech (e.g., “I am burning up. My uterus is on fire. I don’t have a uterus”) or other seeming irrational acts (e.g., a client becoming physically aggressive with other residents who talked to him). Clients were observed to generate hypotheses about the function of their psychotic responses. In each of these seven cases, a probable cause of the bizarre behavior was identified and removed (the client who claimed her uterus was “on fire” was referred to a physician who diagnosed a pelvic infection and treated her with antibiotics; the client who became aggressive was found to react adversely to long conversations and was taught to tell other residents to “leave me alone”), which resulted in cessation of the client’s problematic behavior.

Thus far, only a few functional analyses have been conducted with persons with severe mental disorders with normal intelligence, but results have been encouraging. Wilder, Masuda, O’Connor, and Baham (2001) analyzed the effects of four contingencies on delusional speech in a middle-aged man with schizophrenia: escape from demand, attention, alone, and control (brief termination of attention following bizarre speech). These investigators found that bizarre speech occurred at a substantially higher rate in sessions with attention as compared to the other experimental conditions. Based on this finding, an intervention consisting of differential reinforcement of alternative (DRA) vocalizations (attention for appropriate speech) plus extinction for bizarre vocalizations was applied and evaluated within a reversal design. The intervention was shown to nearly eliminate the client’s psychotic speech. Results of this study were later replicated with a second client also diagnosed with schizophrenia who displayed bizarre vocalizations in the form of tangential remarks (Wilder, White, & Yu, 2003). Utilizing simplified habit reversal procedures, the client in this second study was also taught awareness training and a response to compete with bizarre vocalizations (“Oh, that didn’t make sense, we were talking about ______”). Following a functional analysis that identified attention as the consequence maintaining the highest percentage of bizarre vocalizations, an intervention comprised of awareness training, competing response training, differential reinforcement of appropriate speech, and extinction of bizarre speech was implemented and shown to reduce this psychotic behavior to near zero levels.
Acceptance and Commitment Therapy (ACT)

The roots of ACT can be traced back to laboratory studies showing that verbal stimuli can override schedules of reinforcement in the control of human behavior (Hayes, Brownstein, Hass, & Greenway, 1986; Hayes, Brownstein, Zettle, Rosenfarb, & Korn, 1986) and relational frame theory elucidating that associations between verbal stimuli largely determine the effect of those verbal stimuli (Hayes & Hayes, 1989). ACT for severe mental disorders further assumes that prominent psychotic symptoms are either avoidance or escape responses, or that they engender problematic avoidance or escape (Bach, 2004; Bach, Gaudiano, Pankey, Herbert, & Hayes, 2006).

Schizophrenic delusions are hypothesized to be escape-like responses that permit clients who are troubled by feelings of failure, fear, and demoralization to blame other people or outside events for their difficulties. In contrast, schizophrenic hallucinations are conceived as disturbing internal stimuli that produce avoidance or escape responses that interfere with the client’s functioning (hearing ridiculing voices causes the client to avoid other people). ACT for psychotic symptoms involves: (1) identifying and abandoning internally oriented control strategies; (2) accepting the presence of difficult and disturbing thoughts and feelings; (3) “just noticing” these private experiences without resisting them or accepting them as literally true; and (4) focusing on overt behaviors with valued outcomes.

Results of a controlled study with 80 inpatient participants (Bach & Hayes, 2002) showed that ACT produced lower symptom believability and half the rehospitalization rate of a treatment-as-usual group. Results of another controlled study with 40 inpatients (Gaudiano & Herbert, 2006) showed that ACT produced higher symptom improvement at discharge and lower 4-month rehospitalization rates, the latter result not achieving statistical significance. Although only preliminary evidence exists to support use of ACT with severe mental disorders, data showing the effectiveness of ACT with a variety of other disorders suggests its potential utility with psychotic behavior (Hayes, Masuda, Bisset, Luoma, & Guerrero, 2004).

ACT offers novel techniques for helping clients troubled by private events labeled as psychotic symptoms. By reinterpreting their experience of delusions and hallucinations and by refocusing on productive activity, clients can respond to these internal stimuli in a healthy fashion. A caveat for ACT, however, is that therapists using this technique should be wary of giving social reinforcement for fabricated self-reports of hallucinations (which presents a conundrum because, ultimately, hallucinations are private events and are not independently verifiable) or encouraging acceptance of correctable adversities that the client may have expressed in veiled, metaphorical terms (Schock et al., 1998).

Conclusions and Future Directions

Although ABA is best known for its achievements in the habilitation of persons with developmental disabilities, this approach has a long history in the treatment of severe mental disorders. Some of the first published examples of ABA were studies that increased appropriate behavior or reduced aberrant behavior of chronic mental patients in psychiatric hospitals. In recent years, ABA interventions for severe mental disorders have grown to include refined functional analyses of problem behavior as well as sophisticated verbal and self-instructional techniques (e.g., habit reversal, acceptance and commitment therapy). Refinement of assessment techniques are intended to rectify the treatment failures, lack of generalization, and poor maintenance sometimes associated with earlier behavioral interventions.

Given the extensive history of successful contingency management programs for severe mental disorders and other myriad behavioral problems, it would be prudent to provide this as a treatment component and a foundation for other interventions. Some advantages of contingency management programs are that they make clear, explicit expectations of appropriate client conduct (essential for both client instructional and staff management purposes) and they provide positive reinforcement to strengthen and maintain desired client behavior. Considering the developments in functional analysis and functional assessment, it also would be wise to thoroughly investigate the function of problem behavior before attempting to eliminate it. For
example, assessing the function of noncompliance may lead to greater adherence to outpatient medication regimens. If the client’s circumstances permit conducting a full functional analysis, this would be the most conclusive method of ascertaining its meaning or the specific environmental stimuli which predict and maintaining the problem behavior. Lacking a functional analysis, a FBA can uncover valuable information suggesting treatment procedures that properly take into account the client’s motives.

While working with heterogeneous mental disorders ABA has remained a vital and innovative scientific approach. Although most ABA researchers continue to focus on observable, socially relevant responses, current applications of ABA in mental health involve a broader realm of clinical phenomena that has required conceptual and methodological expansions. ABA practitioners now attend to internal and covert processes during assessment and intervention, as in their use of self-report measures of anxiety and imaginary exercises aimed at changing disturbing thoughts. These radical changes call into question some of the fundamental principles of ABA, and only future research will determine whether these departures represent evolutionary advances of the field. Continued research on integrated models is warranted and will further strengthen the use of ABA within mental health while concurrently providing more efficacious therapies.

Although integration of treatment approaches is not completely straightforward because therapies are based on different assumptions and their procedures can be dissimilar, the use of ACT demonstrates how behavior analysis can merge with relational frame theory to create a vibrant approach to mental health issues. The case study of Lucy illustrates how functional assessment can compliment cognitive behavior therapy (CBT). Although challenges in combining varied ABA approaches and clinical practices within mental health are inevitable, the approaches may complement one another raising the likelihood of producing positive and lasting outcomes.

Research reviewed in this article demonstrated that integration of behavior analysis within mental health services will expand clinicians’ armamentarium and provide more comprehensive assessment and treatment. Behavior analytic techniques, such as FBA can be used to identify environmental stimuli that set the occasion for, elicit, or reinforce problematic behaviors. FBA could also reveal social–environmental variables underlying somatic disorders (as in the case of Lucy described earlier) or somatic variables underlying behavioral disorders (as in the case of the woman with a presumed pelvic infection), thereby facilitating multidisciplinary collaboration and selection of appropriate treatments. Retaining the technology that produced early successes, ABA provides empirically validated instructional procedures and practical methods for engineering a client’s environment to promote adaptive behavior (e.g., parent and staff training, token programs) that no other clinical discipline offers.

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