Behavior Analysis in the Era of Medicalization: The State of the Science and Recommendations for Practitioners

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ABSTRACT

Recent decades have witnessed an increase in biological explanations of common disorders such as depression and anxiety, a phenomenon termed “medicalization” (Conrad, 2007). Behavior analysts may find it difficult to implement non-drug treatment with a populace that has become inundated with biological explanations and a preference for medication as the treatment of choice. Research frequently cited in support of medicalization includes studies of drug effectiveness, as well as family studies and studies of brain structure and function. Methodological and interpretation difficulties within those bodies of research are described and recommendations are made so that behavioral practitioners may function optimally within the culture of biological causation.

Keywords: Drug effectiveness, medicalization

Recent decades have witnessed the rise of genetic and biochemical explanations of behavioral difficulties, within both the professional and popular cultures (Flora, 2007; Joseph, 2003; Lane, 2007; Valenstein, 1998). Termed “medicalization” (Conrad, 2007), it is a phenomenon not to be ignored by therapists whose expertise lies within the field of behavior analysis. Significant numbers of clients now appear at the first therapy session already convinced that their problems or those of their family members are biological in nature and, thus, that they are in need of medication. Often there is little or no empirical evidence for such assumptions by any given client (Lacasse & Leo, 2005; Valenstein, 1998). Rather, the client’s thinking has been shaped by a combination of factors that may have included pharmaceutical industry advertising, the popular media, and/or a physician’s comment that the client is suffering from a “chemical imbalance.”

Such client misunderstandings may lead to difficulty in the implementation of behavioral therapies. For example, when clients are convinced that their difficulties or those of their family members (e.g., children) are biologically

caused, they tend to believe that there is less hope for improvement, even with appropriate treatment (Phelan, 2002). A natural result may be faltering compliance with treatment procedures by the client or a caregiver. A second downside is that, once convinced of biological causation, others in the client’s life report feeling greater prejudice against the client, greater fear of the client, and a stronger desire to maintain distance from the client (Haslam, Sayce, & Davies, 2006; Link, Struening, Rhav, Phelan, & Nuttbrock, 1997). Behavioral practitioners report that, at times, they are faced with a task akin to de-programming, or otherwise coping with the client’s erroneous assumptions, at least to the extent that the client’s improvement may be impeded by those assumptions (Wyatt, 2009).

Various disorders are increasingly conceptualized in biological terms even when there is either weak, or no, support for that conceptualization. Such disorders include depression, anxiety, attention-deficit/hyperactivity disorder (ADHD), child conduct problems, and schizophrenia (Antonuccio, Danton, DeNelsky, Greenberg, & Gordon, 1999; Terry & Kohlenberg, 2006; Valenstein,

1998; Winston, 2006; Wong, 2006a; Wong, 2006b; Wong 2007; Wyatt 2003; Wyatt, 2006; Wyatt & Midkiff, 2006a; Wyatt & Midkiff, 2006b; Wyatt & Midkiff, 2007). Skinner pointed out the cultural shift many years ago when he noted that human biology had become a convenient “dumping ground” where the cause of any unexplained abnormal behavior was hypothesized to lie (Skinner, 1974).

The culture’s medicalization of behavioral disorders has paralleled its increasing reliance on psychotropic medications, coupled with a corresponding weakening of emphasis on non-drug therapies, at least for many clients and professionals. Prescription of psychotropic medicines increased 20% from 1985 to 1994 in the United States. During essentially the same time frame, prescription of stimulants, which are often used in the treatment of ADHD, tripled and those for mood elevators increased to 20 million (Pincus et al., 1998). Far more children now take psychotropic medications in the United States than in other countries. The number of children taking powerful anti-psychotic drugs increased five-fold, from 500,000 to 2.5 million, in just 5 years (Cooper et al., 2006).

Prescription of stimulant medications in children under the age of 5 increased by 49% between 2001 and 2004, according to drug management company Medco Health (Johnson, 2004). In contrast, a 10-year study revealed that, although 44.4% of psychiatric patients received non-drug therapy in 1996-1997, that number had declined to 28.9% by 2004-2005 (Mojtabai & Olfson, 2008). A dilemma for behavior analysts emerges from such findings; greater reliance on medications tends to weaken clients' motivation to undertake therapies that do not involve medications.

Thus, it is advantageous to behavioral practitioners that they acknowledge and be able to respond to several phenomena. These include the culture's turn to biological explanations, the non-empirical factors that have led to that turn, and the limitations of research frequently said to underlie the biological causation model. The culture's acceptance of drug treatment may be based on factors other than research, such as the profit motives of the pharmaceutical industry and turf protection efforts by organized psychiatry. The two groups continue to push the notion that common disorders are biological in nature and that medication should be the first line of treatment. (For further discussion of the history of the dovetailing interests of psychiatry and the pharmaceutical industry, see Wyatt & Midkiff, 2006.) Finally, behavior analysts will benefit from practical suggestions about how they may deal with both medicalization and clients' notions that medications should be the first option in treatment.

This article describes evidence that often is said to support medicalization of disorders and the use of medications to treat psychological problems, with attention to methodological and interpretation issues that render much of that evidence quite weak. The article will conclude with recommendations to guide behavioral practitioners as they treat common disorders, such as depression, anxiety, and child conduct problems, using functional analytic methods.

What Do We Know of Bio-Causation?

The bio-causation model is, perhaps, the primary plank in the platform on which the house of escalating drug treatment has been built. Given that, it is wise to briefly describe the areas of evidence that are frequently cited in support of the biological model. Behavior analysts should be prepared to discuss that evidence in response to challenges from those who are strongly committed to the biological model. The evidence typically cited in support of biological causation generally falls into two categories: family studies and brain structure/function studies.

Family Studies

Family studies consistently show that the closer the family connection, the greater the shared possibility for mental and behavioral disorders, a phenomenon termed concordance. For decades, this fact has been interpreted as evidence of genetic transmission. It is ubiquitous, seen in most standard textbooks in the field (e.g., Barlow & Durand, 2009; Comer,

2005; Sarason & Sarason, 2002). One of the most compelling and enduring displays in such textbooks is a table developed by researcher Irving Gottesman (1991). The table shows the increasing concordance for schizophrenia to a maximum rate of about 48% for monozygotic (identical) twins, across about 40 studies. However, recently both the table and Gottesman's interpretation of it have come under review, with the conclusion that learning variables may parsimoniously account for each of Gottesman's findings (Joseph & Leo, 2006).

This is not the first time that the genetic hypothesis has been scrutinized and found to be less compelling than one might suppose (Farber, 1981; Watson, 1981; Wyatt, Posey, Welker & Seamons, 1984). Studies of identical twins reared apart, which tend to show concordance rates from 15% to 45% depending on the disorder, are frequently taken as the most powerful evidence of genetic transmission because similar environments are said to have been ruled out as causal. However, thoughtful analysis has led to the conclusion that identical twins, although said to have been reared apart, were reared in rather similar environments that may well have accounted for concordance. Several factors have led to that conclusion. First, monozygotic twins are alike in physical appearance (e.g., highly attractive, average, or relatively unattractive) and in rate of development (e.g. early, average, or late). There is a broad developmental psychology literature showing that physical attractiveness and rate of reaching puberty are related to overall adjustment, mood disorders, behavioral difficulties, social adjustment, delinquency, withdrawal, stress coping, substance abuse, and the like (Brooks-Gunn, 1988; Byrne, Ervin, & Lamberth, 1970; Caspi, Lynam, Morritt, & Silva, 1993; Clausen, 1975; Dick, Rose, Viken, & Kapiro, 2000; Ge, Conger, & Elder, 1991 & 1996; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Jones, 1965; Jones & Mussen, 1958; Landy & Sigall, 1974; Mussen & Jones, 1957; Walster, Aronson, Abrahams, & Rottman, 1966).

Second, according to the authors of the identical twin research, the twins were not really reared apart in many instances, but rather were raised by extended family of the biological parents. In other cases, the twins were not separated until up to 10 years of age, or were placed by adoption agencies that were obliged by contract to locate adoptive families that were similar to the biological families (Wyatt, 1993; Wyatt & Midkiff, 2006). Thus, the notion that causal environmental variables were controlled in these studies is open to question. The genetic and environmental factors appear to have been hopelessly confounded. At present, one may conclude that the family studies, and especially the studies of identical twins reared apart, are of little help in unraveling the nature-nurture debate. Behavior analysts should be aware of that fact.

Studies of Brain Structure and Functioning

Positron Emission Tomography (PET) scans and the images obtained in functional Magnetic Resonance Imaging (fMRI) research have opened new windows into the events taking place inside us when we engage in behavior that is

observable to the naked eye. Hot spots, unusual sizes of ventricles, and the like are predictably different when comparing normals to those reliably diagnosed with various disorders. Similarly, autopsy analyses reveal that, when alive, individuals with depression and other disorders possessed unusual levels of certain neurotransmitters. However, the data so obtained typically are correlational. We do not know whether the physical abnormality preceded or followed the depression, anxiety, schizophreniam, or other disordered overt behavior (Faux, 2002).

For example, did a genetic or biochemical abnormality cause the client's overt behavioral problems, or did poor overt functioning (perhaps caused by extreme stress or poor coping skills) result in inner changes in function and/or structure? It is not difficult to describe everyday instances in which behavior brings about changes in bodily structure and/or chemistry. As examples, consider highly stressed individuals who develop ulcers or individuals who lose their jobs, then becomes depressed and cease to engage in physical exercise with a resulting loss in muscle tone and cardiovascular efficiency. Due to the phenomenon known as neuroplasticity, it would not be surprising if there were concurrent changes in the central nervous system, as well (Valenstein, 1998). Although there are exceptions, such as with the discovery of a brain tumor, brain imaging and autopsy studies generally do not reveal causes of behavioral disorders. These technological advances provide the appearance of a scientific causal basis for a given disorder and have undoubtedly contributed to the medicalization phenomenon among the populace.

In light of the limitations of this research, numerous academic sources have included cautions about the etiology of psychological disorders. A chapter of an extensive report by then U.S. Surgeon General David Satcher began, "The precise causes of mental disorders are not known" (U.S. Department of Health and Human Services, 1999, p. 49). The *Introductory Textbook of Psychiatry* stated, "Much of the current investigative research in psychiatry is directed toward the goal of identifying the pathophysiology and etiology of major mental illnesses, but this goal has been achieved for only a few disorders..." (Andreason & Black, 2001, p. 23). Similarly, the *Textbook of Clinical Psychiatry* cautioned, "Although reliable criteria have been constructed for many psychiatric disorders, validation of the diagnostic categories as specific entities has not been established" (Hales & Yudofsky, 2003, p. 43).

Nonetheless, the belief in bio-causation has grown at a rapid pace. For example, 38% of the public viewed depression as a medical illness in 1997, but that figure had climbed to nearly three quarters of the population by 2007 (Ten-year retrospective, 2007). In contrast to public perceptions, researchers who have studied the hypothesized causal link between serotonin

levels and depression – an idea that has been heavily promoted in drug advertisements – are dubious regarding such a link (as cited in Lacasse & Leo, 2005):

- "Although it is often stated with great confidence that depressed people have a serotonin or norepinephrine deficiency, the evidence actually contradicts these claims," Elliot Valenstein (1998), Professor Emeritus of Neuroscience.
- "A serotonin deficiency for depression has not been found," Joseph Glenmullen (2000), clinical instructor of psychiatry, Harvard Medical School.

In light of the limitations of this research, numerous academic sources have included cautions about the etiology of psychological disorders.

- "Some have argued that depression may be due to a deficiency of NE (Norepinephrine) or 5-HT (serotonin)... However, this is akin to saying that because a rash on one's arm improves with the use of a steroid cream, the rash must be due to a steroid deficiency," Psychiatrists Pedro Delgado and Francisco Moreno (2000), in the *Journal of Clinical Psychiatry*.
- "I spent the first several years of my career doing full-time research on brain serotonin metabolism, but I never saw any convincing evidence that any psychiatric disorder, including depression, results from a deficiency of brain serotonin," David Burns (Lacasse & Gomory, 2003), winner of the A. E. Bennett Award given by the Society for Biological Psychiatry for his research on serotonin metabolism.
- "Indeed, no abnormality of serotonin in depression has ever been demonstrated," Psychiatrist and former Secretary for the British Association for Psychopharmacology, David Healy (2004).
- "We have hunted for big simple neurochemical solutions for psychiatric disorders and have not found them," Psychiatrist Kenneth Kendler (2005), co-editor-in-chief of *Psychological Medicine*.

Wayne Goodman, Chair of the Psychopharmacologic Advisory Committee of the U.S. Food and Drug Administration noted that the chemical imbalance theory of depression is a "useful metaphor," but one that should not be employed when doctors talk to patients (Ross, 2008).

Effectiveness of Psychotropic Medications: Some Examples From the Literature

Although some medications, such as anti-anxiety drugs, may well be effective in the short term, there is increasing concern that others are less helpful. For example, a review of 38 studies of anti-depressants with familiar names such as Prozac, Zoloft, Paxil, Serzone, Celexa and Effexor was revealing (Kirsch, Moore, Scoboria, & Nicholls, 2002). The studies, conducted between 1987 and 1999, showed a mean 10-point improvement in mood on the 50-point Hamilton Depression Scale for those taking the drugs and an 8-point improvement for those taking the placebo. One must ask whether the mean two-point advantage for the drugs amounts to significant advantage for the patient in everyday life. A drug company is required to produce only two studies that show a drug to perform better than placebo, notwithstanding the number of studies to the contrary, in order to obtain FDA approval. The Eli Lilly company had to conduct five studies of Prozac in order that two would produce positive results (Khan, Leventhal, Khan, & Brown, 2002).

A review of 19 double-blind studies of top-selling anti-depressants found that the placebo effect accounted for approximately 75% of patients' improvement (Kirsch & Saperstein, 1998). The reviewers asserted that the remaining 25% percent improvement could have been the result of an enhanced placebo response due to drug side effects that enabled subjects to distinguish between placebo and an active drug, or other factors. Another review of 29 published and 11 unpublished studies found that the anti-depressant Paxil was better than placebo at improving symptoms of acute, moderate-to-severe major depression, but that Paxil's unpleasant side effects caused such high discontinuation rates that the drug overall was not better than placebo (Lundberg, 2008).

Likewise, there are relatively high discontinuation rates for anti-psychotic medications. By 18 months, 64% to 82% of patients taking Trilafon, Zyprexa, Seroquel, Risperdal or Geodon have discontinued those medications (Lieberman et al., 2005). That is particularly disturbing, given that many patients taking those particular drugs are told that they must take them forever. Ironically, critics of behavioral approaches are sometimes quick to point out that they do not show optimal generalization across time and settings (e.g., Wakefield, 2006). It is now clear that the same may be said of many psychotropic medications. Thus, the potential beneficial effects of medications must be weighed against their discontinuation rates and their questionable effectiveness, as well as against their negative side effects.

The pharmaceutical industry now underwrites about 75% of all drug studies that appear in prestigious journals such as *Annals of Internal Medicine*, *Journal of the American Medical Association*, *Lancet*, and the *New England Journal of Medicine* (Smith, 2005). Thus, the industry is in a position to exert

substantial control over what is published. For example, there are reports of medical journal articles having been written by employees of pharmaceutical firms, then published as if authored by academicians. There are accounts of funding being pulled from drug studies with negative preliminary results. Editor-in-chief of *The New England Journal of Medicine* Marcia Angell commented on these and other phenomena when she pointed out that the financial ties between drug makers and physician-researchers have become so strong that drug companies often design the studies, analyze the results, write the articles, and decide whether to publish them (Angell, 2008).

In fact, a review of 85 studies of 12 anti-depressants found that 37 of 38 with positive results were published, whereas only 3 of 36 with negative results were published (Turner, Matthews, Linardatos, Tell, & Rosenthal, 2008). Moreover, 11 studies with negative or questionable results were written as if the drug had been effective. When results of FDA anti-depressant trials conducted between 1985 and 2000 were obtained under the Freedom of Information Act, more than half failed to show an advantage of the drug over placebo (Kahn et al., 2002).

Pharmaceutical companies at times hire ghostwriters to author their studies (Barnette, 2003). One company, Merck, produced a pseudo-journal as a marketing tool. The *Australasian Journal of Bone & Joint Medicine* published only reprinted and summarized articles that were favorable to Merck's products and included no disclosure of company sponsorship (Wyatt, 2009). The economic reinforcers for the pharmaceutical industry are enormous. Thus, it is unlikely that the industry's tactics will soon change.

Issues Related to Drug Study Methodology

It is also important for behavior analysts to understand some unique challenges related to the study of medication effectiveness. Chief among them is the problem of generalizing from the subject group to the general population. Many potential participants are routinely excluded from drug trials. Pregnant women, lactating women, and women of childbearing years who are not using contraceptives are excluded from studies of new drugs for obvious and important reasons. Also typically excluded are those who have suffered any mental disorder apart from that under study, patients with serious medical illnesses, those with significant lab test results, those with electrocardiogram (EKG) abnormalities, those receiving anticoagulant, those with positive drug screens or suicidal ideas, and those who have ever received behavioral therapy or electroconvulsive shock treatment (Wyatt & Midkiff, 2006; Zimmerman, Chelminski, & Posternak, 2004). Such exclusions leave groups of study participants who are less than representative of the patients who may eventually take the drug. One researcher reported that 86% of the patients whom he saw clinically would have been excluded from studies of anti-depressants, yet he had prescribed the drugs for 93% of them (Wyatt & Midkiff, 2006).

Another concern is the methodology known as the wash-out phase, which is common to drug studies. This procedure precedes the actual study. In it, all potential participants are given a trial of a placebo. Those who respond to the placebo are excluded from the study. The remaining individuals are then divided into the drug and placebo groups, and the study is conducted. Thus, the deck has been stacked in what seems an indefensible manner, although drug researchers claim that the washout phase strengthens the results by better accounting for placebo effects. Nevertheless, results that show the drug to be better than placebo remain questionable (Antonuccio, Danton, & DeNelsky, 1995; Wyatt & Midkiff, 2006).

Advice for Behavior Analysts

We live in a culture that thirsts for simple explanations and painless solutions. The magical and mentalistic explanations of earlier eras have largely fallen away only to be replaced with biology as causation and medication as the first option in treatment. The evidence to demonstrate genetic or biochemical causation is often weak or non-existent for the vast majority of common presenting problems, such as depression, anxiety disorders, and problems in child conduct (Lacasse & Leo, 2005; Valenstein, 1998; Wyatt & Midkiff, 2006). Moreover, the evidence that medications bring about improvement in either the short term or long term is surprisingly weak. Behavior analysts may ask what may be done to optimize their efforts as they practice within this context. Several recommendations follow.

First, it is important for practitioners to learn more about the history of, and the reinforcers for, adoption of a biological causation model. They may accomplish this by reading one or more of the excellent resources on this subject, such as the book reviewed by Frans van Haaren in this issue of *BAP* or a special issue of *Behavior and Social Issues* (Mattaini, 2006). The rewards for adopting the bio-causation model are powerful. Psychiatry maintains its grip on patient care and its esteem within the medical disciplines. The pharmaceutical industry makes huge profits. Patients feel absolved of responsibility, as that onus shifts to the doctor, and treatment shifts from skill development and manipulation of reinforcement contingencies to the simple task of taking medication. It is unfortunate that pills trump skills for many individuals.

Second, practitioners should learn more about the tactics of the pharmaceutical industry. Payoffs to doctors, downplay of dangerous side effects, overly glowing reports of drug effectiveness, and ghostwritten reports are taints that even leaders in the medical profession have begun to describe (Angell, 2002, 2008). It may be necessary for behavioral practitioners to educate agency personnel, community members, and perhaps individual clients about the drug industry's methods. The state of Pennsylvania has hired consultants to visit doctors to combat drug makers' sales representatives and has launched "ask your doctor" campaigns (Henderson, 2007). A number of medical schools now teach their students ways to resist drug sales pitches (Caruso, 2006; Hopper, Speece, & Musia, 1997). Although it is best to take a positive stance by showing what behavioral approaches may accomplish, thoughtful public presentation of the activities of the pharmaceutical industry would seem to be a responsibility of behavior analysts, at least in some instances.

Third, practicing behavior analysts should develop a working knowledge of psychotropic medications so that they are able to present relevant information to clients, as needed. Typically, these fall into five categories: anti-depressants, anti-anxiety medications, anti-psychotics, anti-mania drugs, and those used to treat ADHD. It is important to be knowledgeable about the uses of these drugs and data on their effectiveness, along with their contraindications and potentially harmful side effects. Much of this information can be found in textbooks such as those adopted for university courses in abnormal psychology (e.g., Barlow & Durand, 2009; Comer, 2007).

Fourth, behavior analysts should acknowledge that medications may be useful. Avoid a "drugs never helped anybody" approach. In fact, at times medications are helpful. The traumatized individual may benefit from a brief course of anti-anxiety medication. Some overly active children may become more attentive with use of stimulant drugs. Psychotic patients may be calmed by anti-psychotic medicines, although the notion purveyed by some that anti-psychotic medications alone "emptied the state hospitals" (e.g., Wakefield, 2006) has been debunked (Wyatt & Midkiff, 2006). Such acknowledgement avoids the impression that the behavior analyst is closed to the obvious and permits objective discussion of the negatives.

Fifth, it is important to avoid slipping into the vortex of

medicalization. In the world of psychiatric hospitals, community behavioral health centers, and insurance reimbursement, it is easy to adopt the language and perspectives of others whose ideologies are firmly rooted in non-empirical, heavily biological interpretations and treatments. Traditional diagnostic terminology is descriptive, not explanatory, for the most part. Thus, a term such as “hyperactivity” describes something that a child does, rather than something that he has. The same may be said for the many permutations of terms such as depression and anxiety. The list has become large. Descriptive labels such as “intermittent explosive disorder” and “dysthymic disorder” tell us that clients have tantrums and that they chronically feel depressed, respectively. However, it is illegitimate to elevate such terms to explanations of the very phenomenon that they merely describe, even though that is done routinely by those whose use of language has become careless.

Sixth, the behavior analyst should frequently consult with behavioral colleagues. Participate in on-line discussions. Read behavioral journals. Join organizations such as the Association for Behavior Analysis-International or one of its affiliates. Attend its meetings. Such connections are helpful in maintaining perspective, keeping current on the literature, and developing a supportive social network.

Seventh, for each client, have at the ready a data-based description that shows how a behavioral approach improved functioning of clients with similar difficulties in functioning. As behavioral practitioners grow in experience, it becomes more probable that such descriptions can be found within their working histories. Until then, practitioners may draw examples from the literature.

Eighth, avoid overuse of behavioral jargon, except when in the presence of other behavior analysts. Terms such as “discriminative stimulus” and “variable-ratio schedule” may be turn-offs to the unwashed. At the same time, one should avoid overuse of laypersons’ terms, as has happened with cognitive scientists who have adopted terms such as memory, storage, and recall and now routinely employ those terms in scientific contexts. Thus, one must walk a fine line so that the use of professional vocabulary does not confuse others or become boring. Paul Chance (2009) suggested that, “One should speak so that the person sitting next to you on the bus would understand it.” That seems good advice, although it may require a great deal of practice to insure that one does not lapse into overuse of lay terminology.

Finally, it would be helpful if the behavior analyst understood and could quickly and gently refute some of the common myths regarding behavioral approaches that are relevant to medicalization. An overly defensive response is futile, and no response may be deadly. Below are several of the more common criticisms and their refutations (Wyatt, 2001):

- **Myth 1:** Behavior analysts ignore genetic influences. Reality: Behavior analysts understand that genes play a role in behavior. Perhaps the most important contribution is that our genetic structure allows us to change our behavior based on its

consequences. As behavior becomes more complex, the contribution that may be attributed directly to genes becomes smaller and that attributed to our learning histories becomes larger.

- **Myth 2:** Behavior analysts ignore or discount thoughts and feelings. Reality: Thoughts and feelings are important because we all have them. However, they are behaviors, things we do, subject to reinforcement and the like, rather than entities with lives of their own that spontaneously cause observable behavior.
- **Myth 3:** In their treatment approaches, behavior analysts overuse punishment procedures. Reality: Positive reinforcement is the watchword of behavior analysts. Skinner (1971) pointed out the essential difficulty in the use of punishment when he wrote, “The trouble is that when we punish a person for behaving badly, we leave it up to him to discover how to behave well.” (p. 62) Review of any issue of this journal, or of behaviorally focused journals such as the *Journal of Applied Behavior Analysis* will reveal few articles involving punishment procedures and many that involve positive reinforcement.
- **Myth 4:** Behavior analysts ignore the uniqueness of the individual. Reality: All individuals are unique because they have unique genetic structures (except in the case of identical siblings) and because they have unique learning histories.

Conclusions

Many clients come to therapy desiring medication, convinced that their difficulties are genetic or biochemical in nature. It then may become difficult to initiate and maintain interventions that are based on operant and respondent relations.

There is hope, however, that the culture will change. A number of individuals have authored progressive books with titles such as these: *Taking America Off Drugs: Why Behavioral Therapy is More Effective for Treating ADHD, OCD, Depression, and Other Psychological Problems* (Flora, 2007); *The Truth about Drug Companies: How They Deceive Us and What To Do About It* (Angell, 2005); *The Gene Illusion: Genetic Research in Psychiatry and Psychology Under the Microscope* (Joseph, 2003); *Shyness: How Normal Behavior Became a Sickness* (Lane, 2007), and *The Medicalization of Society* (Conrad, 2007).

As behavior analysts continue to demonstrate effective therapies, the discipline will advance and the culture will increasingly accept, and even advocate, non-drug, empirically based therapy. In the meantime, it is wise to be alert to the powerful economic forces that now push medications as the treatment of choice. Non-drug therapies such as empirically supported behavioral approaches often will better serve clients, helping them achieve their full potential. Thereby we may optimally serve clients and the culture. That end may be best achieved by understanding the context of behavior analysis in an era of medicalization.

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