Behavior and Social Issues, 15, 152-177 (2006).

LEAD ARTICLE

BEHAVIOR ANALYSIS OF PSYCHOTIC DISORDERS: SCIENTIFIC DEAD END OR CASUALTY OF THE MENTAL HEALTH POLITICAL ECONOMY?

Stephen E. Wong[1]
Florida International University

ABSTRACT: Behavior analysis, once a promising approach to understanding and treating severe mental disorders, has been obscured by the biomedical model of mental illness and its ubiquitous psychotropic drugs. The present paper gives a brief overview of behavioral research on psychotic disorders followed by a critical review of the prevailing biomedical model including psychiatric diagnoses, anti-psychotic medications, clinical outcomes, and adverse effects of drug treatment. This paper also examines ideological, political, and economic mechanisms of control that have blocked the application of behavior analysis with severe mental disorders.
KEYWORDS: behavioral treatment, chronic mental patients, schizophrenia, history of behavior analysis, biomedical model, professional competition, pharmaceutical industry

Behavior analysis once offered a bright promise for advancing the understanding and treatment of severe mental disorders. Half a century ago, landmark studies in the experimental and the applied analyses of behavior were being conducted with psychotic patients in the ill-fated state mental hospitals. B. F. Skinner and Ogden Lindsley first replicated the free-operant paradigm with humans using chronic mental patients as subjects (Rutherford, 2003). They constructed an apparatus in which patients could pull a lever to obtain candy, cigarettes, projected slide images, and other stimuli dispensed on variable-interval and fixed-ratio schedules of reinforcement. Cumulative recorders showed the variable-interval schedules produced stable response rates that varied across individual patients, and the fixed-ratio schedules produced the characteristic post-reinforcement pauses commonly seen with infrahuman organisms maintained on this schedule (Lindsley & Skinner, 1954; Skinner, Solomon, & Lindsley, 1954). These response patterns served as stable baselines against which patients' "psychotic episodes,"

[1] Stephen E. Wong, School of Social Work, Florida International University. The author extends his thanks to David Cohen and Patrick C. Friman for their comments on an earlier version of this paper. Portions of this paper were presented at 2003 Annual Convention of the Association for Behavior Analysis, in San Francisco, California. Correspondence concerning this article should be sent to Stephen E. Wong, School of Social Work, Florida International University, wongse@fiu.edu.

brief periods of hallucinatory, destructive, or other disturbed behavior (lasting 20 minutes to several hours), and "psychotic phases," longer periods of psychotic behavior (lasting weeks or months), could be studied (Lindsley, 1960). This groundbreaking research, conducted at the Harvard Medical School Behavior Research Laboratory, in the Metropolitan State Hospital in Waltham, Massachusetts, both broadened the generality of behavioral principles to humans and demonstrated the feasibility of operant conditioning with psychotic patients.

Another behavior analyst, Kurt Salzinger, was among the first to quantify and analyze the verbal behavior of schizophrenic patients in clinical interviews. Despite the seeming tangentiality of schizophrenic speech, Salzinger and Pisoni (1958, 1961) demonstrated that it was partially controlled by interviewer's questions operating as discriminative stimuli, and interviewer's attending responses (utterances such as "mm-hmm," "uhha," or "I see") operating as positive reinforcement. Salzinger and Pisoni (1960) also found that schizophrenic patients' verbal behavior was less resistant to extinction than that of normal subjects. Based partly on this finding, Salzinger and his colleagues posited a theory in which persons with schizophrenia respond primarily to immediate spatial and temporal stimuli, as compared to normal persons that respond to more remote stimuli (Salzinger, 1973; Salzinger, Portnoy, & Feldman, 1966; Salzinger, Portnoy, Pisoni, & Feldman, 1970).

Behavioral programs for psychotic mental patients were among the first successful clinical applications of operant conditioning. These early programs demonstrated that, contrary to common belief, environmental events could have a substantial influence on the behavior of persons with psychotic disorders. By systematically presenting antecedent and consequent stimuli for specific responses, caretakers could change the rate of a patient's existing behavior or give rise to behavior not currently exhibited by the patient. Development of behavioral programs tended to follow one of two general paths (Stahl & Leitenberg, 1976). The first was individual programs often designed to lessen idiosyncratic responses, such as bizarre rituals or psychotic speech, in a particular client. The second was comprehensive, facility-wide programs aimed at restoring appropriate social behavior, work behavior, personal hygiene, participation in ward activities, and other desired responses in all clients in the setting. Individual programs were often used in conjunction with facility-wide programs, with the former focusing on problems that the latter did not address or did not address adequately (Carlson, Hersen, & Eisler, 1972).

INDIVIDUALIZED BEHAVIORAL PROGRAMS

In one of the first published examples of applied behavior analysis, Ayllon and Michael (1959) devised individualized programs using extinction (planned ignoring), positive reinforcement, stimulus satiation, and negative reinforcement to reduce inappropriate responses of entering the nursing station, verbalizing delusional statements, refusing to feed self, and hoarding objects in eight chronic mental patients. Ayllon and Haughton (1964) later weakened delusional speech, repetitive requests, and somatic complaints in three women, two diagnosed with chronic schizophrenia and one with

depression. They treated problematic behaviors in these patients by teaching nursing staff to ignore delusional statements, while responding to appropriate speech with attention and consumable reinforcement.

Stahl and Leitenberg (1976) reviewed 23 articles published between 1959 and 1972 on individualized programs for psychotic and chronic mental patients covering a spectrum of clinical issues, including incontinence, refusing to eat, eating excessively, repetitive requests for PRN medication, hoarding objects, "sick talk," physical intrusiveness, aggression, uncooperative behavior, and mutism. Treatment procedures applied in these studies consisted of tangible and social reinforcement, shaping, modeling, planned ignoring, stimulus satiation, delay or withdrawal of reinforcement, and systematic desensitization. Nearly all of the individualized programs produced large improvements in the target behavior, and the remainder produced modest gains. Liberman, Wallace, Teigen, and Davis (1974) reported on individualized programs developed for 31 mental patients on the research unit of a state mental hospital, most of whom had a diagnosis of schizophrenia or psychosis plus a history of multiple and extended psychiatric hospitalizations. From one to six individualized programs were designed for each patient's varied problems, which included delusional and abusive speech, verbal and physical aggression, property destruction, poor personal hygiene and grooming, deficient work behavior, auditory hallucinations, social isolation, inappropriate sexual acts, and manipulative behavior. Behavior procedures consisted mainly of positive reinforcement (social, token, or consumable), shaping, response prevention, contingency contracts, planned ignoring, time out from reinforcement, or some form of mild punishment (e.g., negative practice). Approximately 80% of these programs brought about substantial improvements, and therapeutic gains of several of these programs were demonstrated within controlled single-subject experimental designs.

Liberman, King, and De Risi (1976) demonstrated the feasibility of individualized behavioral programs in a community mental health center with 15 outpatients, most with multiple hospitalizations and prior diagnoses of psychosis. Targeted goals for patients included replacing delusional verbalizations with appropriate speech, increasing social interactions, reducing somatic complaints or sick talk, decreasing "psychotic" writing on walls, increasing completion of household chores, and increasing attendance at the community mental health center. Introduction of behavioral procedures, which consisted of verbal prompts, contingent staff attention, and various types of tangible reinforcement, was associated with substantial improvements in targeted goals for 12 of the 15 patients.

The 1970's also witnessed a flurry of studies in which psychotic speech was conceptualized as operant behavior and modified by changing environmental contingencies. This research had theoretical ramifications because within the psychiatric diagnostic scheme these verbalizations were regarded as key symptoms of schizophrenic thinking. In contrast, behavioral researchers, who accorded these responses no special significance, were able to consistently modify them by ignoring inappropriate verbalizations and by positively reinforcing appropriate verbalizations with staff attention, coffee, and snacks (Liberman, Teigen, Patterson, & Baker, 1973); therapist attention (Moss & Liberman, 1975); parent attention (Pinkston & Herbert-Jackson,

1975); access to a preferred work assignment (Anderson & Alpert, 1974); and tokens (Patterson & Teigen, 1973; Wincze, Leitenberg, & Agras, 1972). Although this approach was usually successful in reducing psychotic verbalizations, a few patients failed to respond to tokens as reinforcers and gains of those who responded did not automatically generalize to extra-therapy settings (Wincze et al., 1972).

FACILITY-WIDE BEHAVIORAL PROGRAMS

The token economy (Ayllon & Azrin, 1965, 1968; Atthowe & Krasner, 1968; Schaefer & Martin, 1966) was a major technological advance extending the operant conditioning of one response in one patient to the simultaneous conditioning of multiple responses in multiple patients. The token economy restructured the ward environment by creating contingencies in which a variety of high-probability, rewarding responses were made available by performing low-probability, adaptive responses. Patients purchased edibles, material objects, access to preferred activities, or other desired stimuli with tokens earned by engaging in appropriate work, self-care, ward activities, and socialization (Carlson, Hersen, & Eisler, 1972; Kazdin, 1974, 1977). Although introduction of tangible positive reinforcement was the most prominent feature of token economy programs, these therapeutic systems also changed the fundamental nature of social interactions between staff and patients. When implementing token economies, direct care staff shed the custodial caretaker role and donned an educator role by specifying desired behaviors to be performed, verbally prompting and modeling these responses, praising patients for performing desired behaviors, and gradually raising criteria for future performance. Token economy systems were aimed primarily at initiating and strengthening behaviors contributing to activities of daily living, but they also indirectly reduced inappropriate behavior by replacing it with appropriate behavior (Ayllon & Azrin, 1968, p. 23; O'Brien & Azrin, 1972).

The effectiveness of token economies for increasing adaptive functioning in chronic patients in mental hospitals was demonstrated in several within-subject experiments (Ayllon & Azrin, 1965; Lloyd & Garlington, 1968; Nelson & Cone, 1979; Winkler, 1970) and in an intensive six-year, controlled between-groups study (Paul & Lentz, 1977). Favorable outcomes with token programs were also reported for a group of male residents assigned to a community based program serving as an alternative to hospitalization (Henderson & Scoles, 1970) and for young psychiatric patients in a short-term hospital facility (Hersen, Eisler, Smith, & Agras, 1972). While token economy programs usually produced sizable gains in the adaptive behavior of most patients treated, a small percentage of subjects (3% to 20%) did not respond to the therapeutic contingencies. These treatment failures were most likely due to ineffective positive reinforcers, faulty application of the program, or inflated token values or token earnings (Kazdin, 1983, as cited in Glynn, 1990).

Some researchers questioned the outcomes of token economy programs and what components were responsible for their effectiveness. One study of a token economy applied with a group of chronic, mostly schizophrenic, patients found that token

reinforcement had no effect on patients' participation level (Allen & Magaro, 1971). Another study of a token economy implemented with chronic patients in a partial hospitalization program failed to show differential results for phases in which tokens were dispensed contingently versus non-contingently (Turner & Luber, 1980). However, the first of these two studies gave no description of the back-up reinforcers available within the program; and the second listed nine categories of back up reinforcers, with only one of these categories including consumable items ("coffee breaks") and two of the remaining categories consisting merely of late arrival or early release from the day program. Another study that compared matched groups of chronic schizophrenic patients assigned to either a token economy program or a control group with social reinforcement, feedback, and non-contingent tokens found no difference between the groups on a battery of standardized clinical measures (Hall, Baker, & Hutchinson, 1977). Although the failure of Hall et al. (1977) to detect generalized changes with standardized measures was not a favorable finding, these investigators did not monitor the responses upon which token reinforcement was made contingent, so this study overlooked the specific behavioral changes that should have been produced by a reinforcement system.

A deeper examination of token economies would also consider the sociopolitical barriers to operating behavioral programs in mental hospitals. First of all, mental hospitals are medical institutions with distinct sources of funding, legal and quasi-legal regulations, and administrative frameworks that may be unsupportive, obstructive, or even antithetical to behavioral programs (Moss, 1983, 1993). Second, professional work is highly competitive, so mental health professionals currently employed in the hospital setting are likely to view the entry of behavior analysts as an intrusion into their jurisdiction and area of expertise (Abbott, 1988; Moss, 1983). Third, hospital line staff, such as nurses and nursing aides, are the persons primarily responsible for implementing behavioral programs. However, these personnel rarely receive either professional training or extra incentives for performing these tasks, so they are likely to view these duties as an additional burden. Given these considerations, it is not surprising that researchers have reported problems in setting up and sustaining token economies in psychiatric settings (Corrigan, Kwartarini, & Pramana, 1992; Corrigan et al., 1998; Hall & Baker, 1973; Mosk, Kuehnel, Freeman, Collier, & Turley, 1988). But even these authors have noted that the limits on behavioral programs appeared to be structural and not technical in nature. In other words, difficulties in implementing and maintaining behavioral programs in psychiatric settings seem to be due to social and pragmatic factors and not due to problems inherent in treating severe mental disorders with behavioral procedures.

DECLINING INTEREST IN BEHAVIORAL PROGRAMS

Although insurmountable technological barriers to behavioral programs for psychotic disorders were not reported in the research literature, this approach began to lose momentum and popularity after less than two decades of use. One indicator of this shift was a drop off in the number of published articles on behavioral treatments for chronic mental disorders after the late 1970's (Scotti, McMorrow, & Trawitzki, 1993).

The 1980's revealed a corresponding decline in the number of token economy programs in mental hospitals in both the United States and Great Britain (Glynn, 1990). A survey of 152 Veterans Administration Medical Centers (which in Fiscal Year 1983, treated 46,360 schizophrenic inpatients with an average stay of 98 days) showed that only 6.6% of these facilities had token economy/social learning programs, and only 1.01% of all psychiatric patients treated in the VA were offered this form of therapy (Boudewyns, Fry, & Nightingale, 1986). Trends such as these prompted Alan Bellack, then President of the Association for the Advancement of Behavior Therapy, to lament that his field had lost interest in schizophrenia, a clinical problem that had formerly been a major focus (Bellack, 1986). This pattern has carried on into the present and reviews of psychological and psychosocial treatment of schizophrenia published in the last decade make little mention of token economy programs (Barton, 1999; Lauriello, Bustillo, & Keith, 1999; Mueser, Torrey, Lynde, Singer, & Drake, 2003; Penn & Mueser, 1996; Scott & Dixon, 1995). With the exception of social skills training, other forms of behavioral programs are virtually ignored. Why did behavior analysis and related behavioral approaches to treating this disorder fail to develop and thrive? Why did biomedical interventions, particularly psychotropic medication, become the prevailing treatment for severe mental disorders? Is this prevalence based on sound scientific research and technology or something else? I will try to address these questions by briefly examining some of the assumptions underlying the current biomedical model and some of the historical and contextual factors that lead to its dominance. This discussion will take us into the critical psychiatry literature (see, for example, Boyle, 1990; Breggin, 1991; Cohen, 1990; Cohen, 1994a; Pam, 1990; Ross & Pam, 1995), a realm of discourse with which most behavior analysts are unfamiliar. By critically analyzing the biomedical model we can evaluate the adequacy of this perspective and consider the need for alternate approaches, including the behavioral model.

PSYCHIATRIC DIAGNOSES

Psychiatric diagnoses are a cornerstone in psychiatry's network of ideological, political, and economic control over mental health services. The American Psychiatric Association (APA) holds the copyright on and publishes the official diagnostic system, now in its sixth iteration as the DSM-IV-TR (APA, 2000). DSM diagnoses affect clients' relationship with major social institutions by determining their legal status, eligibility for services, disability benefits, and supposedly appropriate treatments. For professional classifications that hold such great social and institutional significance, DSM diagnoses are peculiar in that the reliability and validity of many of its categories are unverified.

Reliability

Categorical classification of mental states or traits is a rudimentary form of mental measurement. Recognizing that measures must be reliable in order to be valid, clinical and educational psychologists usually strive to establish the reliability of their mental

measures before releasing them for use with the public. By comparison, psychiatric researchers were relatively slow to note the low reliability of DSM diagnoses and to acknowledge that this was a problem. It was not until the mid-1970's that specific diagnostic criteria and structured interviewing protocols were put forth as means of raising the reliability of diagnoses in the upcoming DSM-III (Kirk and Kutchins, 1992, 1994). Nevertheless, NIMH-sponsored, multi-site field studies of the DSM-III conducted in the late-1970's revealed that the reliability of many DSM-III diagnoses was still poor. For example, the reliability coefficient kappa for schizophrenia, the quintessential psychotic disorder, was only .58 (Kirk and Kutchins, 1992; Cooksey & Brown, 1998), well below the DSM researchers' own criteria for acceptability. Within the context of formal research projects reworked DSM-III-R criteria for schizophrenia produced somewhat higher interrater reliability, with kappa values for current diagnosis ranging between .49 and .69; however, psychiatric researchers deemed even these higher coefficients to represent only "fair" levels of interrater agreement (Williams, et al., 1992)

The mission of raising the reliability of DSM diagnoses is an ongoing process that continues with the current version of the manual. Members of the DSM-IV Work Group charged with revising criteria for schizophrenia and other psychotic disorders reviewed research-derived, structured diagnostic interviews to find protocols that would yield better interrater reliability. They recommended that future versions of the DSM omit previously venerated Schneiderian symptoms of schizophrenia (audible thoughts and voices arguing) and place greater emphasis on other symptoms (e.g., "negative symptoms" such as flat affect and poverty of speech) that tend to have higher interrater reliability. They also advised that unreliable prodromal (early signs) and residual symptoms of schizophrenia that were in the DSM-III-R be deleted from the DSM-IV (Andreasen & Flaum, 1994). These recommendations were adopted in the DSM-IV and the DSM-IV-TR. While such revisions will probably increase the reliability of this diagnosis, they illustrate how the label "schizophrenia" arises from deliberations and decisions of professionals as much as any objective, mental or physical condition of patients.

Validity

In addition to problems of reliability, the validity of DSM diagnoses is questionable because there is no "gold standard" of mental disorders to which DSM diagnoses can be compared and validated. DSM diagnoses are not based on any known pathophysiology or etiology, but rather are syndromes defined by the presence or absence of an arbitrary set of symptoms (Andreasen, Flaum, & Arndt, 1992). As described earlier, groups of experts, consisting mainly of psychiatrists, determine what constellation of symptoms constitutes a syndrome. The rapidly increasing number of diagnoses in successive versions of the DSM (Blashfield & Fuller, 1996) is one reflection of how these syndromes are socially constructed. DSM diagnoses have also been shaped by political pressure from external groups. This sort of pressure from gays and lesbians caused the diagnosis of homosexuality to be removed from the DSM, and the opposite kind of pressure from

Vietnam War veterans caused the Post-Traumatic Stress Syndrome to be included as a new diagnosis (Kutchins & Kirk, 1997).

DSM diagnoses are frequently mentioned in the media and everyday conversations, and within those contexts they transform from categories with relatively low reliability and uncertain validity into real, concrete things. Newspaper and magazine articles, television programs, and casual discussions about these purported mental illnesses probably affect our thinking more than the actual DSM manual. For example, widely publicized studies have reported evidence that schizophrenia is associated with a defective gene, the excess or shortage of a particular neurotransmitter (e.g., dopamine), enlarged ventricles (fluid filled spaces) in the brain, and even a viral infection. The NIMH website for schizophrenia (NIMH, 2002) also affirms that mental disorders are fundamentally biological (and not social or environmental) disturbances, proclaiming unequivocally: "Schizophrenia is a chronic, severe, and disabling brain disease."

But a closer look at the biopsychiatric literature reveals inconsistencies in this perspective. Unlike other bona fide diseases there is no consistent physical marker or physiological anomaly associated with schizophrenia (Siebert, 1999). While research showing correlations between schizophrenia and genetic makeup receive much press and airtime, little attention has been given to the fact that subsequent studies have failed to replicate these correlations (Conrad, 2001). Despite assertions about biological causes of this disorder, the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) noted, "No laboratory findings have been identified that are diagnostic of schizophrenia" (APA, 1994; p. 280). In broader terms, the Surgeon General's Report on Mental Health (U.S. Department of Health and Human Services, 1999) has stated, "The precise causes (etiology) of most mental disorders are not known…" (original parentheses). Finally, a recent press release by the American Psychiatric Association (2003) conceded, "…brain science has not advanced to the point where scientists or clinicians can point to readily discernable pathological lesions or genetic abnormalities that in and of themselves serve as reliable or predictive biomarkers of a given mental disorder or mental disorders…"

Of course, the fact that certain psychiatric diagnoses have low interrater reliability and that expert committees devised them do not negate the existence of these disorders. Nor does the present lack of replicable data linking mental disorders to brain anomalies preclude the possibility that future research will discover such links. However, the previous paragraphs call attention to two significant discrepancies: First, despite the DSM's repeated revisions, formidable heft (900-plus pages in its current form as the DSM-IV-TR), and impressive detail and complexity, the empirical data supporting its categorizations are weak. Second, scientific evidence establishing a biological basis for these problematic behaviors has yet to be realized. Nevertheless, this system of labels and its implicit causal model completely dominate current mental health services and research.

Why does psychiatry represent schizophrenia and other mental disorders as being brain diseases without first obtaining definitive evidence? Medical sociologists and other critics of the new biopsychiatry point out that this perspective portrays mental disorders

as somatic problems and therefore the appropriate domain of medical practice, and that it rationalizes psychiatry's hegemony over the other mental health professions (Cohen, 1993; Cooksey & Brown, 1998). During the 1960's when psychiatry was closely aligned with psychoanalysis, psychologists and social workers competed with psychiatry for the opportunity to provide psychoanalysis and other forms of verbal psychotherapy. As psychiatry shifted to biomedical models of mental illness—requiring somatic treatments that only medical practitioners could legally administer—psychiatry regained its standing as the premier mental health profession. This ideological shift also gave psychiatry a rich and powerful ally: The pharmaceutical industry.

PSYCHOTROPIC MEDICATIONS

The new biopsychiatry relies on psychotropic medication as its primary form of treatment. "Conventional antipsychotic" medications (neuroleptics such as chlorpromazine; trade name -- Thorazine) were the first drugs to be used for this purpose, and they are the antipsychotics drugs on which we have the most outcome data. But, despite widespread administration of these drugs over five decades, the outcome data on the main conditions they are used to treat are not impressive. These drugs also have disabling and harmful effects that have been minimized for much of the past century.

Drug Treatment Outcomes

Psychiatric research has evaluated the therapeutic efficacy of neuroleptic medications based on their ability to forestall "relapse," a loose term that can refer to an exacerbation of symptoms or rehospitalization. Results of over 1,300 outcome studies published since the mid-1950's reveals that 21% of schizophrenic patients on maintenance drug therapy relapse as compared to 55% on placebo (Cohen, 1997). Given the bias of scientific journals for publishing positive results (Dickersin, Chan, Chalmers, Sacks, & Smith, 1987) this probably represents an optimistic estimate of the impact of these drugs. By subtracting the relapse rate for neuroleptics from that for placebo treatment, we may compute a "net" drug effectiveness rate of 34%. Undoubtedly, preventing relapse in one third of treated patients is a significant effect; yet, it is probably inadequate justification for past assertions that these drugs were essential or past practices of prescribing these drugs universally.

Enthusiasm for psychotropic drugs should also have been tempered by the limited benefits they made to clients' adaptive functioning and overall quality of life. Sadly, there is almost no research demonstrating that neuroleptic medication has a positive impact on clients' social relationships or ability to work (Cohen, 1997; Gelman, 1999). (Ironically, improving social and pre-vocational functioning were some of the more prominent successes of behavioral programs [Ayllon & Azrin, 1965, 1968; Hersen & Bellack, 1976; Kale, Kaye, Whelan, & Hopkins, 1968].) The dearth of data showing improvement in client functioning or quality of life is consistent with other known properties of neuroleptic drugs to be reviewed in the following section.

Another finding relevant to the efficacy of psychotropic medication comes from epidemiological studies that have compared the prognosis of persons with schizophrenia in different countries. Data obtained by the World Health Organization have shown that people in developed countries, such as the U.S. and the United Kingdom, in which neuroleptics are routinely prescribed, have a poorer rate of recovery as compared to persons in developing nations, such as India and Columbia, in which psychotropic drugs are not so customarily administered (Jablensky et al., 1992; de Girolamo, 1996). If psychotropic drugs were actually effective in the treatment of psychotic disorders, it is difficult to explain why wide scale application of these drugs does not lead to better outcomes for the treated populations.

Debilitating Drug Effects

Neuroleptic drugs have been presented to the public as therapeutic, selective, "antipsychotic" medications. Notwithstanding this popular image, there is abundant information that these drugs do not act specifically on psychotic symptoms, but instead disrupt a broad spectrum of motor, behavioral, affective, and cognitive functions.

Medical researchers initially explored the usefulness of neuroleptic drugs in the 1950's about the same time that other invasive procedures, such as insulin shock, electroconvulsive therapy, and frontal lobotomy, were advanced to manage the unruly conduct of patients in the crowded state mental hospitals (Braslow, 1997; Cohen, 1988). Neuroleptics were known to interfere with coordinated motor activity, to dull sensations, to cloud higher thinking process, and to produce indifference to internal and external stimuli (Cohen, 1997). Early researchers, like Pierre Deniker, one of the discovers of chlorpromazine, were quite candid about the debilitating effects of neuroleptics. Deniker noted that chlorpromazine brought on a decrease in mental and physical activity, physical stiffness, a "mask like" facial expression, and a weakening of the desire to act. Deniker also observed how the drug's effects closely resembled the aftermath of a brain disease – specifically, the sequela of encephalitis lethargica or sleeping sickness (Gelman, 1999).

Neuroleptic drugs, such as chlorpromazine, do not selectively target a person's psychotic symptoms or disturbed thinking, but rather have generalized suppressive and enervating effects. Glimpses into the altered states induced by "antipsychotic" medications have been provided by a few courageous psychiatrists who took the drugs themselves. Cornelia Quarti, a 28-year-old psychiatrist, one of the first who allowed herself to be injected with a dose of chlorpromazine, reported: "...getting weaker and weaker... painful feelings of imminent death (give) way to a euphoric calm. I still feel that I am dying, but this leaves me indifferent...my speech has become painful...I can't find my words...(I am) very tired and must stay in bed." (text in parentheses added; cited in Cohen, 1997). Another psychiatrist, Samuel Gershon, reported similar incapacitation while under the influence of neuroleptics: "Anyone who takes a drug such as chlorpromazine or haloperidol gets a neuroleptic-induced deficit syndrome: that is, one's head is fuzzy, it feels as if it is packed with cotton, one cannot think straight, and one cannot do one's work. I have tried taking these drugs, and it is extremely difficult to get

your thoughts straight." (cited in Gelman, 1999, p. 113). The waking stupor, "psychic indifference," and impaired thinking and speaking caused by neuroleptics contrast sharply with their image as medications that relieve disturbed mental states or that restore normal mental functioning.

Harmful Drug Effects

Neuroleptic drugs produce a host of iatrogenic disorders, many of which are unpleasant and disturbing to the client, and some of which are severely disabling and irreversible. *Extrapyramidal symptoms* (EPS) are a group of medication-induced movement disorders that include a mask-like facial expression, muscle rigidity, strange uncoordinated movements and muscular spasms, and an inability to sit still. Overall, EPS are observed in approximately 60% of patients receiving neuroleptic medications (Cohen, 1997). *Tardive dyskinesia* (TD) is another neurological disorder manifested in uncontrolled movements such as blinking, tongue curling and thrusting, or contortions of the neck, torso, and pelvis, and an abnormal gait. These symptoms are often visible only after the medication is withdrawn, and are usually irreversible (Brown & Funk, 1986). The risk of developing TD during exposure to neuroleptics is cumulative over time and is estimated to increase from 32% after 5 years to 65% after 20 years (Breggin, 1997). Neuroleptic drugs are also associated with disorders that are less common, but more perilous. One of these is the *neuroleptic malignant syndrome* (NMS). Symptoms of NMS include severe loss of motor control, elevated temperature, rapid heart rate, blood pressure fluctuation, excessive perspiration, shortness of breath, difficulty swallowing, and urinary incontinence. Between 1.4% and 2.4% of the patients receiving neuroleptic drugs may be expected to develop this syndrome, and up to 20% of those afflicted with this iatrogenic disease will die from it (Breggin, 1997).

Since the late 1980's and early 1990's, newer medications called "atypical antipsychotics" have been presented as being effective with many clients who do not respond to older neuroleptics and as having a lower risk of EPS and TD. Recent analyses, however, suggests that these drugs are probably no more effective (Geddes, Freemantle, Harrison, & Bebbington, 2000) and no safer than their predecessors (Cohen, 2002; Leucht, Wahlbeck, Hamann, & Kissling, 2003). The one atypical drug that appears to produce fewer EPS symptoms, Clozaril, is linked to a variety of movement disorders and some cases of TD (Cohen, 1994b). Clozaril also suppresses white cell production leaving the client susceptible to lethal infections, and for this reason was banned in European countries in the mid-1970's. And Clozaril is associated with grand mal seizures and the insidious neuroleptic malignant syndrome (Breggin, 1997; Cohen, 1994b).

THE POLITICAL ECONOMY OF PSYCHIATRIC DRUGS

Why are biomedical and pharmaceutical solutions pursued so persistently despite their tenuous scientific rationale, mixed treatment outcomes, and grave health risks? Attempting to answer this question draws us into complexities of the political economy

of mental health services, a topic that we can only touch on here. But one thing is certain—the sale of psychotropic drugs is big business. In 2003, sales of one atypical antipsychotic drug, Zyprexa, totaled $4.28 billion (Eli Lilly, 2003, p. 10). But even this vast sum is only the tip of the iceberg. The pharmaceutical industry is huge, consisting of over 100 companies in the U.S. alone, and extremely lucrative, for the last two decades having the highest profits of any American industry (Angell, 2004). In 2000, the profit margin of this industry was 16.4% (Public Citizen Health Research Group, April 2001, p. 8). Revenues acquired by pharmaceutical industry allow it to guide economic and political movements and to shape mental health services and research.

Thorazine: A Case Study of a Pharmaceutical Industry Campaign

Like other large corporations, pharmaceutical companies foster government expenditures that create markets for their products. The case of Thorazine (chloropromazine) illustrates how successful a pharmaceutical company can be in systematically advancing governmental policies that expand the sales of its product. The story of Thorazine's promotion begins in the embattled state mental hospitals and coincides with the national policy of deinstitutionalization enacted in the 1950's. From 1840 to 1940 the census of state mental hospitals in the U.S. grew at a breakneck pace – roughly 23 times the rate of the general population (Johnson, 1990). As dense overcrowding of the state mental hospitals made it impossible for them to function as treatment facilities, state legislators searched for a way to remedy this social problem while simultaneously stemming the growing burden on state budgets. Timing was fortuitous for the pharmaceutical company Smith, Kline, & French (SK&F), which was launching a nationwide sales campaign to promote its new product Thorazine.

In 1953, SK&F executives discussed marketing Thorazine as a psychiatric drug, but were concerned that psychiatrists in the U.S. would not accept the product due the lack of North American research demonstrating its efficacy. This concern was allayed by the completion of three uncontrolled and methodologically unsophisticated studies conducted in Philadelphia, Houston, and Montreal involving a total of 243 psychiatric patients with heterogeneous diagnoses (Johnson, 1990; Swazey, 1974). Emboldened by these studies, SK&F initiated a sales campaign for Thorazine in 1954 employing a task force of 50 men that took advantage of the crisis in the state mental hospitals. One member of the task force was assigned "…to each state capital to work with citizens' mental health groups and with the legislature on developing their "intensive care (drug) budgets for state hospitals." (Swazey, 1974, p. 203). Partly as a result of this campaign, Thorazine was incorporated as a key element in the states' plans to resolve their budgetary problems through deinstitutionalization. Only 8 months after the start of the SK&F marketing campaign, 2 million patients had been treated with Thorazine. A mere 6 months later, this number is estimated to have doubled to 4 million (Valenstein, 1998).

The sales campaign promoting Thorazine can be contrasted with the introduction of its behavioral counterpart, the first token economy. In their book, *The Token Economy*, Ayllon and Azrin wrote that they initiated their behavioral program in Illinois at Anna

State Hospital in 1961. Although "tempted" to quickly release their positive outcome data, they waited a lengthy four years until they were certain about the durability of their clients' behavior change before publishing their first program report (Ayllon & Azrin, 1968, p. 16). Created, tested, and disseminated within a conservative academic ethos and with the meager resources available to a non-profit enterprise, this behavioral program clearly was no match for the well funded, deliberately expansive, and politically focused sales campaign of a pharmaceutical company.

In recent years, the public relations and political agenda setting techniques of the pharmaceutical companies have only become more sophisticated (Antonuccio, Danton, & McClanahan, 2003; Gosden & Beder, 2001). Consider this excerpt from an article appearing in the *New York Times*:

> Since the mid-1990's, a group of drug companies, led by Johnson & Johnson, has campaigned to convince state officials that a new generation of drugs – with names like Risperdal, Zyprexa and Seroquel – is superior to older and much cheaper antipsychotics like Haldol. The campaign has led a dozen states to adopt guidelines for treating schizophrenia that make it hard for doctors to prescribe anything but the new drugs. That, in turn, has helped transform the new medicines into blockbusters.
>
> Ten drug companies chipped in to help underwrite the initial effort by Texas state officials to develop the guidelines. Then, to spread the word, Johnson & Johnson, Pfizer and possibly other companies paid for meetings around the country at which officials from various states were urged to follow the lead of Texas, according to documents and interviews that are part of a lawsuit and investigation in Pennsylvania…
>
> …About a third of…(new antipsychotic drug)…sales were to state Medicaid programs, whose costs have ballooned with the adoption of the new drugs. Texas, for example, says it spends about $3,000 a year, on average, for each patient on the new drugs, versus the $250 it spent on the older medication. (Peterson, 2004)

OTHER WAYS IN WHICH PHARMACEUTICAL COMPANIES INFLUENCE SOCIETY

Research Establishing Clinical Efficacy

In our technological society scientific research is the process that examines and validates claims of therapeutic efficacy. Although this process is designed to be impartial and objective, it is carried out today within a climate in which commercial and corporate interests wield growing control over the activities of universities and scientists (Krimsky, 2003). This is especially true for research on drug efficacy. Pharmaceutical companies fund 70% of the clinical trials evaluating drug effectiveness (Bodenheimer, 2000), yet the approval of drugs worth billions of dollars annually hinge on these outcome studies. This

creates a conflict between the scientific motives for obtaining objective data and commercial motives for legitimizing a highly profitable product.

There are many ways of designing drug evaluation studies or reporting the resulting data that can magnify the drug's apparent safety and efficacy. Some of these ways, observed in published drug studies, include: not comparing the drug to an effective non-drug (e.g., behavioral) treatment, not comparing the drug to a placebo, not maintaining double-blind procedures, measuring too many outcomes and failing to correct for significant differences obtained by chance, presenting misleading data and analyses, and presenting conclusions that do not agree with the results (Bero & Rennie, 1996). Another way a new drug can be made to look effective is by comparing it to an older drug that is given at high dosages that are nearly toxic or toxic. Numerous studies evaluating atypical antipsychotic medications were conducted in this way comparing the atypical medication to haloperidol (or an equivalent drug) given at higher than recommended dosages (Geddes et al., 2000; Safer, 2002).

Suppressing evidence showing its adverse effects and limited efficacy can also heighten the ostensive safety and effectiveness of a pharmaceutical product (Safer, 2002). Pharmaceutical companies that fund studies often require investigators to sign contracts giving the companies the right of pre-publication approval for all research reports. Pharmaceutical companies have obstructed the release of unfavorable findings about potentially lucrative products by delaying approval of research reports, withholding approval of such reports (Vergano, 2001), threatening legal action if the investigator attempts to publish the report, and threatening future funding if the author attempts to publish the research in question (Bodenheimer, 2000). The end result of these selective processes is that the published research data available to the public can be so skewed that it may completely misrepresent the existing scientific evidence.

Unpublished data from clinical trials for the three new antipsychotic drugs marketed in the 1990's, Zyprexa (olanzapine), Risperdal (risperdal), and Seroquel (quetiapine), obtained from the FDA through Freedom of Information requests, raise troubling questions about their efficacy (Whitaker, 1998, 2002). In trials for these three drugs 60% of the 7,269 patients who received the experimental drug dropped out before the study period ended (in trials for Seroquel, 80% of the 2,162 subjects dropped out), typically six to eight weeks. Patients dropped out of the study because the drugs were not helpful, because of side effects, or because they simply refused to continue participating. Such a high dropout rate would be expected to skew data for the remaining subjects in a favorable direction, but the extent of subject dropout and its implications were glossed over in the published studies on these drugs.

Selective release of information that distorts perceived efficacy is not isolated to antipsychotic drugs. Antidepressant drugs are ubiquitous in the treatment of depression and it is generally assumed that their effectiveness has been scientifically validated. However, Kirsch, Moore, Scoboria, and Nicholls (2002), using the Freedom of Information Act to obtain results of clinical trials on the six most widely prescribed antidepressants approved between 1987 and 1999 (Prozac, Zoloft, Paxil, Effexor, Serzone, and Celexa), found that of 47 trials conducted on the six drugs only 20 showed a

measurable advantage of drugs over placebo. This is a much lower ratio of efficacy than is found in the published literature. Furthermore, the clinical difference -- as opposed to the statistical difference -- between the drug and placebo groups was quite small. Patients receiving drugs improved an average of 10 points on the 52-point Hamilton Depression Rating Scale, while patients exposed to the placebo improved by slightly more than eight points. The authors described the two-point difference on the Hamilton as "clinically meaningless." At least two other independent analyses of FDA data have also shown that antidepressant medications had a statistically significant advantage over inert placebo in less than half of the randomized controlled trials (Antonuccio, Danton, & McClanahan, 2003).

Influencing the FDA Approval Process

Since the mission of the U.S. Food and Drug Administration (FDA) is to ensure that the public obtains safe and effective drugs (USFDA, 2004), one might assume that all drugs receiving FDA approval and sold legally in this country would meet these criteria. However, like other governmental regulatory agencies, the FDA is susceptible to "capture" by the industry it is intended to regulate (Abraham, 1995). One mechanism of capture is the infiltration of the regulatory agency by expert consultants or staff who have favorable biases towards or vested interests in the industry. The pharmaceutical industry appears to have already succeeded in making such inroads. A headline story from a Sept. 2000 issue of *USA Today* reported "...that more than half of the experts hired to advise the government on the safety and effectiveness of medicine have financial relationships with the pharmaceutical companies that will be helped or hurt by their decisions..." (Cauchon, 2000). More importantly, in the past few years vocal proponents of the drug industry and former drug industry executives have been appointed to top administrative positions within the FDA, further blunting the ability of the FDA to monitor the safety, efficacy, and cost-efficiency of medications (Angell, 2004; Cohen, 2001). Perhaps partly due to such appointments, the FDA was criticized for suppressing conclusions of one of its own drug-safety analysts who was about to report that antidepressants (e.g., Zoloft, Paxil) increased the potential for suicide among children and adolescents. Only after receiving an independent re-analysis that confirmed their own expert's conclusion, and after the British government banned the use of these drugs with children and adolescents (Goode, 2003), and after public hearings in which parents and professionals accused the FDA of failing to provide adequate protection did FDA officials reverse their initial stance and require drug manufacturers to issue warning labels that these products could lead patients to become suicidal (Harris, 2004).

Influencing Professional Opinion

Pharmaceutical companies capitalize on physicians' penchant for drug treatment and use extensive advertising strategies to convince physicians to prescribe their particular products. Usually these ads promote newer and more costly drugs over older drugs whose

patents have expired. Full-page, color ads showing dramatic recoveries supposedly brought about with psychotropic drugs occupy many of the most prestigious psychiatric journals, including the *Archives of General Psychiatry* and *The American Journal of Psychiatry*. Personal visits by drug company representatives is another way to disseminate information and influence prescribing habits, and a large proportion of physicians admit that they rely on these contacts as their primary means of obtaining information about new drugs (Valenstein, 1998, p. 166; Brown & Funk, 1986). Drug companies also provide financial support for professional conferences, symposia, grand rounds, and workshops that discuss and recommend pharmaceuticals. As inducements to attend such meetings drug companies have paid physicians' airfare, lodging, food, and given them $1,000 stipends (Siegel, 2001). Drug companies and physicians deny that these "educational" activities and gifts directly affect prescribing practices; but the claim that these carefully designed and expensive campaigns have been pursued without intending to raise drug sales sounds less than forthright.

Influencing and Misrepresenting Public Opinion

As the result of federal deregulation, drugs are now sold to the public with the same advertisements that are used so successfully to market cars, clothes, and kitchen cleansers ("Miracle Drugs or Media Drugs," 1992). These ads, crafted by Madison Avenue artisans, evoke emotional reactions, create associations, and prompt viewers to purchase products with a power that behavior analysts might envy. At the same time, these advertisements have been criticized for the limited amount of information they contain about the disorder being treated, actual effectiveness and adverse effects of the drug being promoted, or alternative treatments (Wolfe, 2002). In 1999, pharmaceutical companies spent $13.7 billion dollars for such advertisements (Cohen, McCubbin, Collin, & Perodeau, 2001).

A stealthier use of financial resources is the funding of citizen organizations sympathetic to biomedical explanations and pharmacological treatment for mental problems that can serve as "front groups" for pharmaceutical industry initiatives. Drug companies have provided generous grants to patient advocacy groups such as the National Alliance for the Mentally Ill (NAMI), which between 1996 and 1999 received a total of $11.7 million from 18 drug firms, (Silverstein, 1999). Children and Adults with Attention Deficit Disorder (CHAAD) is another advocacy group that has received substantial support from the pharmaceutical industry (DeGrandpre, 1999, p. 18; Valenstein, 1998, p. 179). In return, these organizations can act as representatives of patients and their families pressuring government officials and legislators to support biomedical research and treatments (Cohen & McCubbin, 1990; Mosher & Burti, 1994).

Biased Allocation of Government Service and Research Funds to the Biomedical Model

Deferring to biomedical doctrine, government and service agencies provide resources for interventions and research consistent with this ideology and withhold resources for activities inconsistent with this approach. The shift to biomedical approaches reduced what was a relatively small proportion of federal funds for psychosocial mental health research to an even more paltry level. NIMH grants awarded to psychology and social science departments declined from over 35% of all grants to academic departments in the late '70's to less than 25% in the '90's (National Institute of Mental Health, 2001). Funds actually allocated to psychosocial research were probably less than these figures suggest. By one estimate, only 6% of NIMH-funded research on schizophrenia in 1987 involved psychosocial treatment or non-biological prevention strategies (Cohen, 1993). Cuts in federal funding for psychosocial research would predictably bring about a decline in both the quantity and quality of this scientific enterprise. Foreshadowing this decline, Skinner and Lindsley's Harvard Medical School Behavior Research Laboratory closed in 1965, due in part to difficulty in obtaining government research funds to support the facility (Rutherford, 2003).

Biases against behavioral research can operate at the state as well as the federal level. A case in point is the research of Dr. Gordon Paul. Dr. Paul is a clinical psychologist and Distinguished Professor who conducted the most intensive and lengthy evaluation of a token economy program to date (Paul & Lentz, 1977; Liberman, 1980). Paul and Lentz's 6-year, randomized controlled experiment showed that the token economy surpassed its comparisons, a milieu/therapeutic community and a traditional hospital, in practical outcomes of hospital release rate, days remaining in the community, and lowered costs per patient (Glynn & Mueser, 1986; Paul & Menditto, 1992). The token economy also achieved better outcomes than the traditional hospital while requiring less psychotropic medication. After completing this important project, Dr. Paul sought funding from NIMH and the MacArthur Foundation to replicate his work. In discussions with agency staff Dr. Paul received strong encouragement that his proposed research would be funded. However, at the final step before submitting the formal research proposal, the newly appointed Director of the Texas Department of Mental Health refused to sign it. The reason the Director gave for not approving the proposal was, "All chronic mental patients need is an appropriate DSM diagnosis and the right drug. There wouldn't be any chronic mental patients if psychologists and social workers weren't in control." (G. Paul, personal communication, September 23, 2001).

If pro-biomedical biases operate in federal and state bureaucracies, it stands to reason that they would also reign in departments of psychiatry, schools of medicine, and affiliated research facilities. This poses a formidable barrier to behavioral psychologists wishing to work with severe mental disorders, because appointments in departments of psychiatry may be one of the few entries into this area of practice. In 1982, while working in my first professional position as an Assistant Research Psychologist with the UCLA Department of Psychiatry and the Camarillo State Hospital Research Center,

several of my colleagues and I responded to an interdepartmental request for proposals for new research seed money (maximum amount: $5,000). We submitted seven proposals for studies investigating novel behavioral procedures to improve adaptive functioning (e.g., interpersonal skills, grooming and self-care, work behavior, recreational activity) and to decrease maladaptive behavior (e.g., psychotic speech, aggression) in persons with chronic mental disorders. All of these proposals included pilot data suggesting that the proposed research projects would have positive outcomes. A few months later, we were disappointed to hear that none of our proposals were awarded funds. Despite this lack of support, we proceeded with the projects anyway. Most of these studies and their spin-offs eventually were published in respectable behavioral or psychiatric journals (Corrigan, Liberman, & Wong, 1993; Massel, Corrigan, Liberman, & Milan, 1991; Wong, et al., 1987; Wong, et al., 1993; Wong, Flanagan, et al., 1988; Wong, Wright, Terranova, Bowen, & Zarate, 1988; Wong & Woolsey, 1989). We later heard that a neuropsychologist down the hall from us had been awarded over $50,000 in departmental money to study the relationship of laterality (right or left-handedness) to schizophrenia. At that time, research on laterality in schizophrenia examined the relationship between this disorder and hemispherical dominance, but the utility of this information was unclear. It appeared that our behavioral studies, which showed immediate promise of developing more effective techniques for improving patients' adaptive functioning and decreasing problem behaviors, had been passed over in favor of biologically oriented research that had uncertain applicability back in 1982, and that 20 years later has still proven fruitless.

CONCLUSIONS

This paper recalls the potential utility that behavior analysis once offered for the study and treatment of psychoses and severe mental disorders. This optimism was grounded in successful clinical applications of behavior analysis and therapy in numerous settings with myriad behavioral problems in clients with long standing psychotic disorders. The decline of behavioral approaches in the treatment of psychoses is a minor mystery in the history of science, and I have suggested that an understanding of this seeming dead end requires that one look beyond the activities of behavioral researchers to larger ideological, political, and economic movements within which mental health services and research are embedded. Although behavior analysis is a process governed by rules of scientific inquiry and proof, the application of behavior analysis itself is determined by social processes that have little to do with science.

The preceding discussion suggests the sizable disadvantages that behavioral programs have when trying to compete with biomedical interventions in the current political economy of mental health services. Helping professions such as behavior analysis and clinical psychology are not venture capital/profit-seeking enterprises and they do not generate the surplus capital needed to compete with the alliance of psychiatry, mental hospitals, and pharmaceutical companies. Without these financial resources they are unable to sustain programs of commercial research or to pursue large-

scale campaigns involving professional education, media advertising, sponsorship of client advocacy groups, infiltration of government regulatory agencies, lobbying of legislative representatives (Little, 2001), or other forms of political influence. Without windows of opportunity, such as those opened by the highly publicized misuse of "behavior modification" in a Miami institution for persons with mental retardation that lead the State of Florida to sponsor the training and certification of behavior analysts (Johnston & Shook, 1987), behavior analysis has been unable to resist the surge of biomedical theories and interventions for mental disorders. Despite these disadvantages, behavior analysis continues to be a promising approach for conceptualizing and treating psychotic disorders (Wong, 1996), and for conducting theoretical contingency analyses (Layng & Andronis, 1984; Schock, Clay, & Cipani, 1998) and empirical functional analyses of psychotic behavior (Mace & Lalli, 1991; Mace, Webb, Sharkey, Mattson, & Rosen, 1988; Wilder, Masuda, O'Connor, & Baham, 2001; Wilder, White, & Yu, 2003). However, these rare works are at risk of being lost in the current flood of biomedically-oriented information.

The present paper outlined three key features of the biomedical model of mental disorders: 1) this approach has many conceptual, empirical, and therapeutic shortcomings; 2) its dominance over mental health services rests on interlocking ideological, political, and economic systems of control; and, 3) the biomedical hegemony has been strengthened with the growth of the highly profitable pharmaceutical industry. These developments are based neither on logical arguments, empirical evidence, nor other elements of good science, so they should not deter behavior analysts or other researchers from continuing to explore alternative means of understanding and treating these disorders.

REFERENCES

Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*. Chicago: The University of Chicago Press.

Abraham, J. (1995). *Science, politics, and the pharmaceutical industry: Controversy and bias in drug regulation.* London: University College London (UCL) Press.

Allen, D. J., & Magaro, P. A. (1971). Measures of change in token-economy programs. *Behaviour* Research and Therapy, 9, 311-318. **http://dx.doi.org/10.1016/0005-7967(71)90043-X**

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders *(4th ed.)*. Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (4th ed.-rev.).* Washington, DC: Author.

American Psychiatric Association. (2003, September 25). *American Psychiatric Association statement on diagnosis and treatment of mental disorders* (Release No. 03-39). Washington, DC: Author.

Anderson, L. T., & Alpert, M. (1974). Operant analysis of hallucination frequency in a hospitalized schizophrenic. *Journal of Behavior Therapy and Experimental Psychiatry, 5,* 13-18. **http://dx.doi.org/10.1016/0005-7916(74)90007-X**

Andreasen, N., & Flaum, M. (1994). Characteristic symptoms of schizophrenia. In T. A. Widiger, A. J. Frances, H. A. Pincus, M. B. First, R. Ross, & W. Davis (Eds.), *DSM-IV sourcebook: Volume 1* (pp. 351-379). Washington, DC: American Psychiatric Association.

Andreasen, N., Flaum, M., & Arndt, S. (1992). The comprehensive assessment of symptoms and history (CASH): An instrument for assessing diagnosis and psychopathology. *Archives of General Psychiatry*, 29, 615-623. http://dx.doi.org/10.1001/archpsyc.1992.01820080023004

Angell, M. (2004). *The truth about the drug companies: How they deceive us and what to do about it.* New York: Random House.

Antonuccio, D. O., Danton, W. G., & McClanahan, T. M. (2003). Psychology in the prescription era: Building a firewall between marketing and science. *American Psychologist*, 58, 1028-1043. http://dx.doi.org/10.1037/0003-066X.58.12.1028

Attowe, J. M., & Krasner, L. (1968). Preliminary report on the application of contingent reinforcement procedures (token economy) on a "chronic" psychiatric ward. *Journal of Abnormal Psychology*, 73, 37-43. http://dx.doi.org/10.1037/h0025439

Ayllon, T., & Azrin, N. H. (1965). The measurement and reinforcement of behavior of psychotics. *Journal of the Experimental Analysis of Behavior*, 8, 357-383. http://dx.doi.org/10.1901/jeab.1965.8-357

Ayllon, T., & Azrin, N. (1968). *The token economy: A motivational system for therapy and rehabilitation.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

Ayllon, T., & Haughton, E. (1964). Modification of symptomatic verbal behaviour of mental patients. *Behaviour Research and Therapy*, 2, 87-97. http://dx.doi.org/10.1016/0005-7967(64)90001-4

Ayllon, T., & Michael, J. (1959). The psychiatric nurse as a behavioral engineer. *Journal of the Experimental Analysis of Behavior*, 2, 323-334. http://dx.doi.org/10.1901/jeab.1959.2-323

Barton, R. (1999). Psychosocial rehabilitation services in community support systems: A review of outcomes and policy recommendation. *Psychiatric Services*, 50, 525-534.

Bellack, A. S. (1986). Schizophrenia: Behavior therapy's forgotten child. *Behavior Therapy*, 17, 199-214. http://dx.doi.org/10.1016/S0005-7894(86)80051-X

Bero, L. A., & Rennie, D. (1996). Influences on the quality of published drug studies. *International Journal of Technology Assessment in Health Care*, 12(2), 209-237. http://dx.doi.org/10.1017/S0266462300009582

Blashfield, R. K., & Fuller, A. K. (1996). Predicting the DSM-V. *Journal of Nervous and Mental Disease*, 184(1), 4-7. http://dx.doi.org/10.1097/00005053-199601000-00002

Bodenheimer, T. (2000). Uneasy alliance: Clinical investigators and the pharmaceutical industry. *The New England Journal of Medicine*, 342(20), 1539-1544. http://dx.doi.org/10.1056/NEJM200005183422024

Boudewyns, P. A., Fry, T. J., & Nightingale, E. J. (1986). Token economy programs in VA Medical Centers: Where are they today? the *Behavior Therapist*, 6, 126-127.

Boyle, M. (1990). *Schizophrenia: A scientific delusion?* New York: Routledge.

Braslow, J. (1997). *Mental ills and bodily cures: Psychiatric treatment in the first half of the twentieth century*. Berkeley, CA: University of California Press.

Breggin, P. R. (1991). *Toxic psychiatry*. New York: St. Martin's Press.

Breggin, P. R. (1997). *Brain disabling treatments in psychiatry: Drugs, electroshock, and the role of the FDA*. New York: Springer.

Brown, P., & Funk, S. C. (1986). Tardive dyskinesia: Barriers to the professional recognition of an iatrogenic disease. *Journal of Health and Social Behavior*, 27, 116-132. http://dx.doi.org/10.2307/2136311

Carlson, C. G., Hersen, M., & Eisler, R. M. (1972). Token economy programs in the treatment of hospitalized adult psychiatric patients. *The Journal of Nervous and Mental Disease*, 155(3), 192-204. http://dx.doi.org/10.1097/00005053-197209000-00006

Cauchon, D. (2000, September 25). FDA advisors tied to industry. *USA Today*, pp. 1A, 10A.

Cohen, C. I. (1993). The biomedicalization of psychiatry: A critical overview. *Community Health Journal*, 29, 509-521.

Cohen, D. (1988). Social work and the psychotropic drug treatments. *Social Service Review, 62*, 576-599. http://dx.doi.org/10.1086/644576

Cohen, D. (Ed.) (1990). Challenging the therapeutic state: Critical perspectives on psychiatry and The mental health system. *The Journal of Mind and Behavior*, 11(3/4), 247-574.

Cohen, D. (Ed.) (1994a). Challenging the therapeutic state, Part two: Further disquisitions on the mental health system. *The Journal of Mind and Behavior*, 15(3/4), 1-198.

Cohen, D. (1994b). Neuroleptic drug treatment of schizophrenia: The state of confusion. *The Journal of Mind and Behavior, 15*(1/2), 139-156.

Cohen, D. (1997). A critique of the use of neuroleptic drugs in psychiatry. In S. Fisher & R. P. Greenberg (Eds.), *From placebo to panacea: Putting psychiatric drugs to the test* (pp. 173- 228). New York: John Wiley & Sons, Inc.

Cohen, D. (2002). Research on the drug treatment of schizophrenia: A critical appraisal and implications for social work education. *Journal of Social Work Education*, 38, 217-239.

Cohen, D., & McCubbin, M. (1990). The political economy of tardive dyskinesia: Asymmetries in power and responsibility. *The Journal of Mind and Behavior*, 11(3/4), 219-242.

Cohen, D., McCubbin, M., Collin, J., & Perodeau, G. (2001). Medications as social phenomena. Health, 5(4), 441-469. http://dx.doi.org/10.1177/136345930100500403

Cohen, J. S. (2001). *Overdose: The case against the drug companies*. New York: Jeremy P. Tarcher/Putnam.

Conrad, P. (2001). Genetic optimism: Framing genes and mental illness in the news. *Culture, Medicine and Psychiatry*, 25, 225-247. http://dx.doi.org/10.1023/A:1010690427114

Miracle drugs or media drugs? (1992, March). *Consumer Reports*, pp. 142-146.

Cooksey, E. C. & Brown, P. (1998). Spinning on its axes: DSM and the social construction of psychiatric diagnoses. *International Journal of Health Services*, 28(3), 525-554. http://dx.doi.org/10.2190/1C4D-B7XT-BLLY-WH4X

Corrigan, P. W., Kwartarini, W. Y., & Pramana, W. (1992). Staff perceptions of barriers to behavior therapy at a psychiatric hospital. *Behavior Modification*, 16(1), 132-144. http://dx.doi.org/10.1177/01454455920161007

Corrigan, P. W., Liberman, R. P., & Wong, S. E. (1993). Recreational therapy and behavior management on inpatient units: Is recreational therapy therapeutic? *Journal of Nervous and Mental Disease*, 181, 644-646. http://dx.doi.org/10.1097/00005053-199310000-00012

Corrigan, P. W., Williams, O. B., McCracken, S. G., Kommana, S., Edwards, M., & Brunner, J. (1998). Staff attitudes that impede the implementation of behavioral treatment programs. *Behavior Modification*, 22, 548-562. http://dx.doi.org/10.1177/01454455980224006

de Girolamo, G. (1996). WHO studies on schizophrenia: An overview of the results and their implications for the understanding of the disorder. In P. R. Breggin & E. M. Stern (Eds.), *Psychosocial approaches to deeply disturbed persons*. New York: Haworth Press.

DeGrandpre, R. (1999). Ritalin nation: *Rapid-fire culture and the transformation of human consciousness*. New York: W. W. Norton & Company.

Dickersin, K., Chan, S., Chalmers, T. C., Sacks, H. S., & Smith, H. (1987). Publication bias and clinical trials. *Controlled Clinical Trials*, 8(4), 343-353. http://dx.doi.org/10.1016/0197-2456(87)90155-3

Eli Lilly and Company Annual Report, Notice of Annual Meeting, and Proxy Statement. (2003). Retrieved April 17, 2004, from http://www.lilly.com/investor/annualreport/lillyar2003complete.pdf.

Geddes, J., Freemantle, N., Harrison, P., & Bebbington, P. (2000). Atypical antipsychotics in the treatment of schizophrenia: Systematic overview and meta-regression analysis. *British Journal of Medicine (BMJ)*, 321, 1371-1376. http://dx.doi.org/10.1136/bmj.321.7273.1371

Gelman, S. (1999). *Medicating schizophrenia: A history*. New Jersey: Rutgers University Press.

Glynn, S. M. (1990). Token economy approaches for psychiatric patients: Progress and pitfalls over 25 years. *Behavior Modification*, 14, 383-407. http://dx.doi.org/10.1177/01454455900144002

Glynn, S. M., & Mueser, K. T. (1986). Social learning for chronic mental patients. *Schizophrenia Bulletin*, 12(4), 648-668. http://dx.doi.org/10.1093/schbul/12.4.648

Goode, E. (2003, December 16). British ignite debate in U.S. on drugs and suicide. *The New York Times*. Retrieved December 16, 2003 from nytimes.com database.

Gosden, R., & Beder, S. (2001). Pharmaceutical industry agenda setting in mental health policies. *Ethical Human Sciences and Services*, 3(3), 147-159.

Hall, J., & Baker, R. (1973). Token economy systems: Breakdown and control. *Behaviour Research and Therapy*, 11, 253-263. http://dx.doi.org/10.1016/0005-7967(73)90001-6

Hall, J. N., Baker, R. D., & Hutchison, K. (1977). A controlled evaluation of token economy procedures with chronic schizophrenic patients. *Behaviour Research and Therapy*, 15, 261-283. http://dx.doi.org/10.1016/0005-7967(77)90023-7

Harris, G. (2004, September 14). F.D.A. links drugs to being suicidal. *The New York Times.* Retrieved September 15, 2004 from the nytimes.com database.

Henderson, J. D., & Scoles, P. E. (1970). Conditioning techniques in a community-based operant environment for psychotic men. *Behavior Therapy*, 1, 245-251. http://dx.doi.org/10.1016/S0005-7894(70)80037-5

Hersen, M., & Bellack, A. S. (1976). A multiple-baseline analysis of social-skills training in chronic schizophrenics. *Journal of Applied Behavior Analysis*, 9, 239-245. http://dx.doi.org/10.1901/jaba.1976.9-239

Hersen, M., Eisler, R. M., Smith, B. S., & Agras, W. S. (1972). A token reinforcement ward for young psychiatric patients. *American Journal of Psychiatry*, 129(2), 142-233.

Jablensky, A., Sartorius, N., Ernberg, G., Anker, M., Korten, A., Cooper, J. E., Day, R., & Bertelsen, A. (1992). Schizophrenia: Manifestations, incidence, and course in different cultures: A World Health Organization ten-country study. *Psychological Medicine, Monograph Supplement* 20, 1-97. http://dx.doi.org/10.1017/S0264180100000904

Johnson, A. B. (1990). *Out of bedlam: The truth about deinstitutionalization.* New York: Basic Books.

Johnston, J. M., & Shook, G. (1987). Developing behavior analysis at the state level. *The Behavior Analyst*, 10, 199-233.

Kale, R. J., Kaye, J. H., Whelan, P. A., & Hopkins, B. L. (1968). The effects of reinforcement on the modification, maintenance, and generalization of social responses of mental patients. *Journal of Applied Behavior Analysis*, 1, 307-314. http://dx.doi.org/10.1901/jaba.1968.1-307

Kazdin, A. E. (1974). A review of token economy treatment modalities. In D. Harshbarger & R. F. Maley (Eds.), *Behavior analysis and system analysis: An integrative approach to mental health programs*. Kalamazoo, MI: Behaviordelia, Inc.

Kazdin, A. E. (1977). *The token economy* (pp. 85-93). New York: Plenum Press.

Kazdin, A. E. (1983). Failure of persons to respond to the token economy. In E. B. Foa & P. Emmelkamp (Eds.), *Failures in behavior therapy* (pp. 335-354). New York: Wiley.

Kirk, S. A., & Kutchins, H. (1992). *The selling of the DSM: The rhetoric of science in psychiatry*. New York: Aldine De Gruyter.

Kirk, S. A., & Kutchins, H. (1994). The myth of the reliability of the DSM. *The Journal of Mind and Behavior*, 15 (1/2),71-86.

Kirsch, I., Moore, T. J., Scoboria, A., & Nicholls, S. S. (2002). The emperor's new drugs: An

analysis of antidepressant medication data submitted to the U.S. Food and Drug Administration. *Prevention & Treatment*, 5, Article 23, Retrieved December 9, 2003 from http://journals.apa.org/prevention/volume5/pre0050023a.html

Krimsky, S. (2003). *Science in the private interest: Has the lure of profits corrupted biomedical research?* Lanham, MD: Rowman & Littlefield Publishers, Inc.

Kutchins, H., & Kirk, S. A. (1997). Making us crazy -- *DSM: The psychiatric bible and the creation of mental disorders*. New York: Free Press.

Layng, T. V., & Andronis, P. T. (1984). Toward a functional analysis of delusional speech and hallucinatory behavior. *The Behavior Analyst*, 7(2), 139-156.

Lauriello, J., Bustillo, J., & Keith, S. J. (1999). A critical review of research on psychosocial treatment of schizophrenia. *Biological Psychiatry*, 46(10), 1409-1417. http://dx.doi.org/10.1016/S0006-3223(99)00100-6

Leucht, S., Wahlbeck, K., Hamann, J., & Kissling, W. (2003). New generation antipsychotics versus low-potency conventional antipsychotics: A systematic review and meta-analysis. *Lancet*, 361, 1581-1589. http://dx.doi.org/10.1016/S0140-6736(03)13306-5

Liberman, R. P. (1980). A review of Paul and Lentz's psychological treatment for chronic mental patients: Milieu versus social-learning programs. *Journal of Applied Behavior Analysis, 13*, 367-371. http://dx.doi.org/10.1901/jaba.1980.13-367

Liberman, R. P., King, L. W., & De Risi, W. J. (1976). Behavior analysis and therapy in community mental health. In H. Leitenberg (Ed.), *Handbook of behavior modification and behavior therapy* (pp. 566-603). Englewood Cliffs, NJ: Prentice Hall.

Liberman, R. P., Teigen, J., Patterson, R., & Baker, V. (1973). Reducing delusional speech in chronic paranoid schizophrenics. *Journal of Applied Behavior Analysis*, 6, 57-64. http://dx.doi.org/10.1901/jaba.1973.6-57

Liberman, R. P., Wallace, C., Teigen, J., & Davis, J. (1974). Interventions with psychotic behavior. In K. S. Calhoun, H. E. Adams, & K. M. Mitchell (Eds.), *Innovative treatment methods in psychopathology* (pp. 323-412.). New York: John Wiley & Sons.

Lindsley, O. R. (1960). Characteristics of the behavior of chronic psychotics as revealed by freeoperant conditioning methods. *Diseases of the Nervous System (Monograph Supplement)*, 21, 66-78.

Lindsley, O. R., & Skinner, B. F. (1954). A method for the experimental analysis of the behavior of psychotic patients. *American Psychologist*, 9, 419-420.

Little, S. (2001, September/October). The other drug war – Companies spent $177 million on lobbying in 1999-2000. *Public Citizen News*, 21(5), 5.

Lloyd, K. E., & Garlington, W. K. (1968). Weekly variations in performance on a token economy ward. *Behaviour Research and Therapy*, 6, 407-410. http://dx.doi.org/10.1016/0005-7967(68)90020-X

Mace, F. C., Webb, M. E., Sharkey, R. W., Mattson, D. M., & Rosen, H. S. (1988). Functional analysis and treatment of bizarre speech. *Journal of Behavior Therapy and Experimental Psychiatry*, 19(4), 289-296. http://dx.doi.org/10.1016/0005-7916(88)90060-2

Mace, F. C., & Lalli, J. S. (1991). Linking descriptive and experimental analyses in the treatment of bizarre speech. *Journal of Applied Behavior Analysis*, 24, 553-562. http://dx.doi.org/10.1901/jaba.1991.24-553

Massel, H. K., Corrigan, P. W., Liberman, R. P., & Milan, M. A. (1991). Conversational skills training of thought-disordered schizophrenic patients through attention focusing. *Psychiatry Research*, 38, 51-61. http://dx.doi.org/10.1016/0165-1781(91)90052-Q

Miracle drugs or media drugs? (1992, March). *Consumer Reports*, 142-146.

Mosher, L., & Burti, L. (1994). *Community mental health: A practical guide* (pp. 28-31). New York: W. W. Norton & Company.

Mosk, M. D., Kuehnel, T. G., Friedman, D. S., Collier, R., & Turley, F. (1988). Behavior therapy in a state hospital: Overcoming obstacles to implementation. *the Behavior Therapist*, 11, 119-122.

Moss, G. R. (1983). Behavioral technology and hospital psychiatry: Considerations from the private sector. *Analysis and Interventions in Developmental Disabilities*, 3, 205-214. http://dx.doi.org/10.1016/0270-4684(83)90015-0

Moss, G. R. (1993). A commentary on the status of the behavioral approach in the healthcare marketplace. *Journal of Behavior Therapy & Experimental Psychiatry*, 24 (4), 311-319. http://dx.doi.org/10.1016/0005-7916(93)90055-2

Moss, G. R., & Liberman, R. P. (1975). Empiricism in psychotherapy: Behavioral specification and measurement. *The British Journal of Psychiatry*, 126, 73-80. http://dx.doi.org/10.1192/bjp.126.1.73

Mueser, K. T., Torrey, W. C., Lynde, D., Singer, P., & Drake, R. E. (2003). Implementing evidence-based practices for people with severe mental illness. *Behavior Modification*, 27(3), 387-411. http://dx.doi.org/10.1177/0145445503027003007

National Institute of Mental Health. (2001) *NIMH research grants to colleges and universities by academic department fiscal years 1976-2000*. (Graph) Retrieved August 31, 2001, from http://www.nimh.nih.gov/srcbook/2000/FY200019.jpg

National Institute of Mental Health. (2002). *Schizophrenia*. Retrieved July 3, 2003, from http://www.nimh.nih.gov/publicat/schizoph.cfm

Nelson, G. L., & Cone, J. D. (1979). Multiple-baseline analysis of a token economy for psychiatric inpatients. *Journal of Applied Behavior Analysis*, 12, 255-271. http://dx.doi.org/10.1901/jaba.1979.12-255

O'Brien, F., & Azrin, N. H. (1972). Symptom reduction by functional displacement in a token economy: A case study. *Journal of Behavior Therapy & Experimental Psychiatry*, 3, 205-207. http://dx.doi.org/10.1016/0005-7916(72)90075-4

Pam, A. (1990). A critique of the scientific status of biological psychiatry. *Acta Psychiatrica Scandinavica, 82* (Supplement 362), 1-35. http://dx.doi.org/10.1111/j.1600-0447.1990.tb06868.x

Patterson, R. L., & Teigen, J. R. (1973). Conditioning and post-hospital generalization of nondelusional responses in a chronic psychotic patient. *Journal of Applied Behavior Analysis*, 6, 65-70 http://dx.doi.org/10.1901/jaba.1973.6-65

Paul, G. L., & Lentz, R. J. (1977). *Psychosocial treatment of chronic mental patients: Milieu versus social-learning programs.* Cambridge, MA: Harvard University Press.

Paul, G. L., & Menditto, A. A. (1992). Effectiveness of inpatient treatment programs for mentally ill adults in public psychiatric facilities. *Applied and Preventive Psychology*, 1, 41-63. http://dx.doi.org/10.1016/S0962-1849(05)80133-7

Penn, D. L., & Mueser, K. T. (1996). Research update on the psychosocial treatment of schizophrenia. *American Journal of Psychiatry*, 153(3), 607-617.

Peterson, M. (2004, February 1). Making drugs, shaping the rules. *The New York Times.* Retrieved February 1, 2004 from the nytimes.com database.

Pinkston, E. M., & Herbert-Jackson, E. W. (1975). Modification of irrelevant and bizarre verbal behavior using parents as therapists. *Social Service Review*, 49, 46-63. http://dx.doi.org/10.1086/643209

Public Citizen Health Research Group. (2001, April). High drug prices for research or profit? *Health Letter*, 17(4), 8. Washington, DC: Author.

Ross, C. A., & Pam, A. (1995). *Pseudoscience in biological psychiatry: Blaming the body*. New York: John Wiley & Sons.

Rutherford, A. (2003). Skinner boxes for psychotics: Operant conditioning at Metropolitan State Hospital. *The Behavior Analyst*, 26, 267-279.

Safer, D. J. (2002). Design and reporting modifications in industry-sponsored comparative psychopharmacology trials. *The Journal of Nervous and Mental Disease*, 190(9), 583-592. http://dx.doi.org/10.1097/00005053-200209000-00002

Salzinger, K. (1973). *Schizophrenia: Behavioral aspects*. New York: John Wiley & Sons.

Salzinger, K., & Pisoni, S. (1958). Reinforcement of affect responses of schizophrenics during the clinical interview. *Journal of Abnormal and Social Psychology*, 57(1), 84-90. http://dx.doi.org/10.1037/h0040304

Salzinger, K., & Pisoni, S. (1960). Reinforcement of verbal affect responses of normal subjects during the interview. *Journal of Abnormal and Social Psychology*, 60(1), 127-130. http://dx.doi.org/10.1037/h0044056

Salzinger, K., & Pisoni, S. (1961). Some parameters of verbal affect responses in schizophrenic subjects. *Journal of Abnormal and Social Psychology*, 63(3), 511-516. http://dx.doi.org/10.1037/h0042648

Salzinger, K., Portnoy, S., & Feldman, R. S. (1966). Verbal behavior in schizophrenics and some comments toward a theory of schizophrenia. In P. H. Hoch, & Zubin, J. (Eds.), *Psychopathology of schizophrenia* (pp. 98-128). New York: Grune & Stratton.

Salzinger, K., Portnoy, S., Pisoni, D. B., & Feldman, R. S. (1970). The immediacy hypothesis and response-produced stimuli in schizophrenic speech. *Journal of Abnormal Psychology*, 76(2), 258-264. http://dx.doi.org/10.1037/h0029887

Schock, K., Clay, C., & Cipani, E. (1998). Making sense of schizophrenic symptoms; delusional statements and behavior may be functional in purpose. *Journal of Behavior*

Therapy and Experimental Psychiatry, 29(2), 131-141. http://dx.doi.org/10.1016/S0005-7916(98)00010-X

Scott, J. E. & Dixon, L. B. (1995). Psychological interventions for schizophrenia. *Schizophrenia Bulletin*, 21(4), 621-630. http://dx.doi.org/10.1093/schbul/21.4.621

Scotti, J. R., McMorrow, M. J., & Trawitzki, A. L. (1993). Behavioral treatment of chronic psychiatric disorders: Publication trends and future directions. *Behavior Therapy*, 24, 527-550. http://dx.doi.org/10.1016/S0005-7894(05)80316-8

Siebert, A. (1999). Brain disease hypothesis for schizophrenia disconfirmed by all evidence. *Ethical Human Sciences and Services*, 1(2), 179-189.

Siegel, M. (2001, July 16). Needed: Rx for Drug Costs. *The Nation*, 273(3), 6-7.

Schafer, H. H., & Martin, P. L. (1966). Behavioral therapy for "apathy" of hospitalized schizophrenics. *Psychological Reports*, 19, 1147-1158. http://dx.doi.org/10.2466/pr0.1966.19.3f.1147

Silverstein, K. (1999, November/December). *Prozac.org: An influential mental health nonprofit finds its 'grassroots' watered by pharmaceutical millions*. Retrieved April 4, 2004, from http://motherjones.com/news/feature/1999/11/nami.html.

Skinner, B. F., Solomon, H. C., & Lindsley, O. R. (1954). A new method for the experimental analysis of the behavior of psychotic patients. *Journal of Nervous and Mental Disease*, 120, 403-406.

Stahl, J. R., & Leitenberg, H. (1976). Behavioral treatment of the chronic mental hospital patient. In H. Leitenberg (Ed.), *Handbook of behavior modification and therapy* (pp. 211-241). Englewood Cliffs, NJ: Prentice-Hall.

Swazey, J. P. (1974). *Chlorpromazine in psychiatry: A study in innovation*. Cambridge, MA: The MIT Press.

Turner, S. M., & Luber, R. F. (1980). The token economy in day hospital settings: Contingency management or information feedback. *Journal of Behavior Therapy and Experimental Psychiatry*, 11, 89-94. http://dx.doi.org/10.1016/0005-7916(80)90002-6

U.S. Department of Health and Human Services. (1999). Chapter 2, Overview of etiology. In *Mental health: A report of the Surgeon General*. Retrieved January 26, 2004, from http://www.mentalhealth.org/features/surgeongeneralreport/chapter2/sec3.asp#biosocial

U.S. Food and Drug Administration. (2004). *FDA's Mission Statement*. Retrieved March 23, 2004, from http://www.fda.gov/opacom/morechoices/mission.html

Valenstein, E. S. (1999). *Blaming the brain: The truth about drugs and mental health*. New York: The Free Press.

Vergano, D. (2001, May 17). Filed under F (for forgotten): Drug companies send unfavorable research to the nether regions. *USA Today*, D8.

Whitaker, R. (1998, November 17). Lure of riches fuels testing. *The Boston Globe*. Retrieved August 23, 2003 from the Boston.com database.

Whitaker, R. (2002). *Mad in America: Bad science, bad medicine, and the enduring mistreatment*

of the mentally ill. Cambridge, MA: Perseus Books.

Wilder, D. A., Masuda, A., O'Connor, C., & Baham, M. (2001). Brief functional analysis and treatment of bizarre vocalizations in an adult with schizophrenia. *Journal of Applied Behavior Analysis*, 34, 65-68. http://dx.doi.org/10.1901/jaba.2001.34-65

Wilder, D. A., White, H., Yu, M. (2003). Functional analysis and intervention for bizarre speech exhibited by an adult with schizophrenia: A replication and extension. *Behavioral Interventions*, 18, 43-52. http://dx.doi.org/10.1002/bin.128

Williams, J. B. W., Gibbon, M., First, M. B., Spitzer, R. L., Davies, M., Borus, J., Howes, M. J., Kane, J., Pope, H. G., Rounsaville, B., & Wittchen, H. (1992). The structured clinical interview for the DSM-III-R (SCID): II. Multisite Test-Retest Reliability. *Archives of General Psychiatry*, 49, 630-636. http://dx.doi.org/10.1001/archpsyc.1992.01820080038006

Winkler, R. C. (1970). Management of chronic psychiatric patients by a token reinforcement system. *Journal of Applied Behavior Analysis*, 3, 47-55. http://dx.doi.org/10.1901/jaba.1970.3-47

Wincze, J. P., Leitenberg, H., & Agras, W. S. (1972). The effects of token reinforcement and feedback on the delusional verbal behavior of chronic paranoid schizophrenics. *Journal of Applied Behavior Analysis*, 5, 247-262. http://dx.doi.org/10.1901/jaba.1972.5-247

Wolfe, S. M. (2002). Direct-to-consumer advertising – Education or emotion promotion? *New England Journal of Medicine*, 346(7), 524-526. http://dx.doi.org/10.1056/NEJM200202143460713

Wong, S. E. (1996). Psychosis. In M. Mattaini & B. A. Thyer (Eds.), *Finding solutions to social problems: Behavioral strategies for change* (pp. 319-343). Washington, D.C.: American Psychological Association.

Wong, S. E., Flanagan, S. G, Kuehnel, T. G., Liberman, R. P., Hunnicutt, R., & Adams-Badgett, J. (1988). Training chronic mental patients to independently practice personal grooming skills. *Hospital and Community Psychiatry*, 39, 874-879.

Wong, S. E., Terranova, M. D., Bowen, L., Zarate, R., Massel, H. K., & Liberman, R. P. (1987). Providing independent recreational activities to reduce sterotypic vocalizations in chronic schizophrenics. *Journal of Applied Behavior Analysis*, 20, 77-81. http://dx.doi.org/10.1901/jaba.1987.20-77

Wong, S. E., Martinez-Diaz, J. A., Massel, H. K., Edelstein, B. A., Wiegand, W., Bowen, L., & Liberman, R. P. (1993). Conversational skills training with schizophrenic inpatients: A study of generalization across settings and conversants. *Behavior Therapy*, 24, 285-304. http://dx.doi.org/10.1016/S0005-7894(05)80270-9

Wong, S. E., & Woolsey, J. E. (1989). Re-establishing conversational skills in overtly psychotic, chronic schizophrenic patients: Discrete trials training on the psychiatric ward. *Behavior Modification*, 13, 415-430. http://dx.doi.org/10.1177/01454455890134002

Wong, S. E., Wright, J., Terranova, M. D., Bowen, L., & Zarate, R. (1988). Effects of structured ward activities on appropriate and psychotic behavior of chronic psychiatric patients. *Behavioral Residential Treatment*, 3, 41-50.