

*PILLS OR SKILLS FOR HYPERACTIVE CHILDREN*

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The controversial nature of drug treatment of hyperactivity, the incidence and sequelae of hyperactivity, and problems of differential diagnosis of hyperactivity versus aggression were discussed. The effects of psychostimulant medication and behavior therapy on hyperactive children were reviewed with regard to effects on their social and academic behavior. Both treatments have resulted in clear short-term changes in social behavior but neither long-term academic nor long-term social effects have been shown with either treatment. Short-term effects on academic behavior have resulted from behavioral interventions but not from psychostimulants. However, the interventions have been too brief to allow one to draw unequivocal conclusions about the clinical efficacy of behavioral treatments. Although there have been long-term evaluations of psychostimulant therapy, there have not been any evaluations of long-term behavioral treatment programs for hyperactive children. Given the salutary short-term effects of behavior therapy with hyperactive children, extended clinical trials of behavior therapy need to be conducted. Finally, specific directions are suggested for future research.

DESCRIPTORS: hyperactivity, pharmacological treatment, behavioral treatment, dietary effects on hyperactivity, elementary school children

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Although many of you may be aware of the furor surrounding the pharmacological treatment of hyperactive children, others may not be cognizant of the intensity or seriousness of the debate. Therefore, I would like to acquaint you with some of the social and political issues associated with the pharmacological treatment of hyperactivity. After discussing some of the reasons for this controversy, I will examine the scope of hyperactivity and note how it is diagnosed. Finally, I will direct my attention to the merits of both pharmacological and psychological treatments for hyperactivity.

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*Controversy over Drug Treatment*

The controversy over the pharmacological treatment of hyperactive children is illustrated by the following three events which brought national attention to the problem.

1. In 1970, the *Washington Post* reported that 5 to 10% of children in Omaha, Nebraska, were given psychostimulant medication for hyperactivity. That incorrect report (Maynard, 1970) and various media renditions of it, which became known as "The Omaha Incident," sparked Congressional hearings on the use of stimulant medication with children. (Actually, the Assistant Superintendent of the Omaha School District would not estimate the percentage of children on medication, but a local physician estimated 5 to 10% of the school population.)

2. In 1975, two free-lance authors, Schrag and Divoky, wrote a book, *The Myth of the Hyperactive Child*, which received considerable publicity as illustrated by Schrag's synopsis of

their book in the *New York Times*. That synopsis was titled, "Readin', Writin' (and Druggin')" (Schrage, 1975). The essence of their message is contained in the following quotation from Schrage's article.

Before scientists have had a chance to systematically study and refine the issues, the field has become the domain of educators and the drug industry. It has also become a playground for charlatans. . . . There is some evidence, however, that the drugs do make some children more docile (which makes some teachers happy), that in some cases they can induce psychotic episodes and hallucinations, and that in many, if not most, they cause irreversible weight loss and a stunting of growth. What the kids are getting is speed. (p. 13)

In fact, Schrage and Divoky's well-publicized statements are clearly exaggerated and, in certain cases, patently false. For example, there is no clear evidence that there is irreversible weight loss or growth stunting associated with psychostimulant use (Roche, Lipman, Overall, & Hung, in press). Rather, there is a distinct growth rebound when children cease taking Dexedrine (Safer & Allen, 1976). Further, hyperactive children are not receiving Methedrine, the specific amphetamine known as "speed," and, interestingly, they do not report the "high" experienced by adults when they take psychostimulants. *The Myth of the Hyperactive Child* was written as an investigative report. Although it contained important inaccuracies and polemics, it was nevertheless informative and it well illustrated the problems of diagnosing and treating hyperactive children.

3. In 1978, the *American Educator*, the professional journal of the American Federation of Teachers, carried an article titled "Hyperactivity: The Scandalous Silence," by Stephen Box, a sociology lecturer from England. The central theme of the article was as follows:

There is a scandalous silence about a form of violence going on in the schools. . . .

The violence I refer to is the increasing employment of "medical solutions" to problems which are essentially moral, legal, and social. . . . Instead of recognizing the inarticulate cries of rage and despair and examining the very serious problems these hyperactive children face, there is an intense drive to individualize their problems, and blame them on organic impairments; . . . Drugs are then administered to dampen and confuse the child's scarcely heard protests. In this way the minds of a generation of the ethnically and economically deprived are being hollowed out, and the revolt of a potentially delinquent population avoided. (pp. 22-24)

Like the Schrage and Divoky book, this article made an emotional plea to rethink the place of the medical and psychiatric establishment in the education of children. "The Omaha Incident," Schrage and Divoky's book, and Box's article clearly exposed the public to the problem of treatment of hyperactive children, and the impact of these publications illustrates the public's serious concern about this problem. No serious-minded clinician who sees families or children can ignore the knotty issues of pharmacological vs. psychological treatment of hyperactive children. When the issue is aired on national television and discussed in a magazine that reaches every member of a major teachers' union in this country, we are besieged by parents and teachers alike who are confused about what can or should be done for their children who are labeled hyperactive. Parents are plagued by a plethora of both causes and cures for this problem, and my intent here will be to discuss: (1) the incidence of hyperactivity and the use of various treatments, (2) what constitutes hyperactivity, and (3) the advantages and disadvantages of psychostimulant medication and behavior modification (i.e., pills and skills).

#### *Incidence of Hyperactivity*

The concern about treating hyperactivity has come into bold focus in part because of the inci-

dence of hyperactivity and the marked increase in the use of psychostimulant drugs for hyperactivity in the past 20 years. Hyperactivity was infrequently discussed and diagnosed 15 years ago, but in 1971, according to a DHEW report, 5% of elementary school children were hyperactive. Alternately stated, on the average at least one hyperactive child existed in every elementary school classroom. Several surveys reported that hyperactivity was present in as many as 30% of the cases seen in child psychological clinics and in 10% of the regular caseloads of pediatric clinics. As Safer and Allen (1976) stated: "The most common child psychiatric disability is hyperactivity."

#### *Incidence of Drug Treatment*

Survey data from Baltimore County indicated that the percentage of children receiving medication for hyperactivity increased from 1.07% in 1971, to 1.73% in 1973, to 2.08% in 1975, and to 2.12% in 1977 (Krager, Safer, & Earhardt, 1979). As Sprague and Gadow (1976) pointed out, estimates of the number of children in the United States on psychostimulant medication vary considerably depending upon whether the estimates are based on school nurse surveys, physician surveys, or the National Disease and Therapeutic Index (NDTI), an index based on private practice physicians stratified by regions of the country. Furthermore, usage varies with geographic region (Whalen & Henker, in press). Utilizing the best information available, however, it appears that approximately 600,000 to 700,000 children receive psychostimulant medication for hyperactivity during the school year. The number of children receiving such medication may be leveling off, but the incidence of psychostimulant use has increased markedly since the early 1960s (Sprague & Gadow, 1976).

In this author's opinion, the burgeoning number of children diagnosed as hyperactive has been at least partly spurred by the pharmaceutical industries. For example, from January to September 1979, full-page advertisements for psychostimulants for hyperactivity appeared in

seven of nine *Pediatrics* issues. Interestingly, by far the greatest advertising is for Cylert (pemo-line), a new drug whose use is greatly increasing. Of course, other factors such as physicians' ability to save children who might have died from birth complications; increased environmental pollutants, such as lead (Baloh, Sturm, Greene, & Gleser, 1975; Needleman, Gunnoe, Leviton, Reed, Peresie, Maher, & Barrett, 1979); food additives (Rose, 1978); greater public awareness, and more objective assessments of hyperactivity, may well have contributed to the increasing diagnosis of hyperactivity. However, when the potential market for a medication is 5% of all elementary school children, that market is very big business.

#### *Incidence of Dietary Treatment*

Dietary specialists and allergists have also begun to stake their claim on the hyperactivity market as illustrated by the phenomenal development of Feingold associations in this country since the publication of Feingold's book, *Why Your Child is Hyperactive*, in 1975. Feingold's approach involves the elimination of artificial food coloring—especially red and yellow dyes; a preservative—BHT (Butolated hydroxy toluene), as well as natural salicylates contained in foods such as apricots, prunes, raspberries, tomatoes, and cucumbers. Feingold reported that when he placed hyperactive children on a salicylate-free diet, 30% showed a response that he termed dramatic and 18% more responded favorably. Although his claims have been tested and found lacking substantiation<sup>1</sup> for most children in at least five controlled studies (Harley, in press), the Feingold associations, as well as other natural food groups, have been so powerful that they have convinced some food chains to package foods labeled additive and preservative free. Although it is impossible to determine the precise number, probably at least 200,000 children are on the Feingold diet (based on num-

<sup>1</sup>Rose (1978) illustrated the deleterious effects of large amounts of additives, but he was not testing the Feingold diet per se.

ber of families in Feingold associations in the U.S., Random House sales figures of Feingold's book from 1975-1978,<sup>2</sup> and estimates of treatment regimens [Lambert, Sandoval, & Sassone, 1978]).

In summary, two salient developments, the use of psychostimulant medication and a dietary approach, have prompted a shift in the conceptualization of behaviors previously seen as attentional problems, character problems, laziness, and lack of directedness. Such behaviors, which are now labeled hyperactive, have often been attributed to brain dysfunction or food sensitivities. The brain dysfunction was to be treated with medication and food sensitivity with a dietary regimen. Both of these conceptualizations gave parents a ready means of switching the onus of responsibility from society, schools, and themselves to the physician and to physical causes. Although it is true that the hyperactive behavior of a small percentage of hyperactive children is due to clear neurological deficits, it seems equally plausible to seek the crucial etiological factors of hyperactivity of many children in the home, social, and educational environment.

Although no social learning theorist has postulated that hyperactivity per se is learned, it is this author's opinion that many behaviors characteristic of hyperactivity certainly could be learned. "For example, of the behaviors which distinguish hyperactive from normal children (Stewart, Pitts, Craig, & Dieruf, 1966), the following behaviors presumably are influenced by learning: talks too much, leaves class without permission, constantly demands candy, can't tolerate teasing, is destructive, is defiant, doesn't complete projects" (O'Leary, in press, pp. 7-8). As I mentioned earlier, hyperactivity was not discussed much until two decades ago, and many people currently feel that professionals are simply relabeling "Peck's Bad Boy" by invoking a medical label or diagnosis. Frankly, I never

heard the label, hyperactive, when I was in elementary school in the late 1940s. Kids with short attention spans and short frustration tolerances were simply described as clowns, lazy, silly, and not liking school. With 5% of elementary school children hyperactive—2% of them who are on medication, 1% who have tried or are on the Feingold diet, and an undetermined percentage who are receiving behavior therapy—one may ask why are so many children treated at all? Often these children, whether labeled "Peck's Bad Boys" or hyperactive, do not progress academically or socially and they do need help. The question of interest is what type of help is needed? To decide that, it seems especially important to know what constitutes hyperactivity.

#### *Definition of Hyperactivity*

According to the American Psychiatric Association's *Diagnostic and Statistical Manual* (APA, DSM-II 1968),<sup>3</sup> a hyperactive or hyperkinetic child is a child characterized by short attention span, restlessness, and overactivity. This seemingly straightforward definition of hyperactivity based on overt behaviors is misleading, for, in fact, children with other behavioral problems such as conduct disorders or unsocialized aggressive reactions have the same difficulties, i.e., short attention span, restlessness, and overactivity. Because of the problem of differential diagnosis of children, some investigators prefer the term "minimal brain dysfunction" (Wender, 1971), because the term was purportedly related to the causes of hyperactivity. Others have long resorted to drug responsiveness as a means of defining hyperactivity and implicated brain damage as a cause of the problem. Neither of these means of defining hyperactivity seems useful. In the first place, there is no evidence

<sup>3</sup>The proposed DSM-III contains a new classification, *Attention Deficit Disorder*, which is to replace the term hyperkinesis. Subcategories include: (1) uncomplicated, (2) with hyperactivity, (3) with conduct problems, and (4) with conduct problems and hyperactivity.

<sup>2</sup>There have been approximately 170,000 copies of the Feingold book sold since 1978. Information provided by Random House, August 24, 1978.

indicating that all or even most hyperactivity results from minimal brain dysfunction (Rutter, 1977). Because of the frequent assumption that hyperactivity results from brain dysfunction and/or a neurological lag, psychostimulant medication has been given. It was thought that such central nervous system stimulants would somehow act on that deficit and enable the child to function normally. Therefore, it was believed that hyperactive children had a dysfunction that was not present in normals and which could be ameliorated by psychostimulants. However, in studies by Shetty (1971) and Rapoport, Buchsbaum, Zahn, Weingartner, Ludlow, and Mikkelsen (1978), it has been seen that normal children exhibit the same responsiveness to medication as do hyperactives.

Diagnosing hyperactivity on the basis of drug responsiveness appears to deny causes of hyperactivity such as environmental and nutritional determinants. In brief, it would appear best to simply use the terms "responders" and "non-responders" to medication and eliminate the logical fallacy and excess conceptual baggage associated with labeling on the basis of responsiveness to a medication.

At present, it appears most reasonable to regard hyperactivity as a set of behaviors—such as excessive restlessness and short attention span—that are quantitatively and qualitatively different from those of children of the same sex, mental age, and SES. In fact, normative data from teacher ratings have been obtained that show that in the United States and New Zealand, such ratings can reliably place children in the upper 5% of the population (Werry, Sprague, & Cohen, 1975).

The most frequently used measurement device, the Teacher Rating Scale (TRS) (Conners, 1969), reflects more than a simple judgment regarding activity level. It implicitly allows a teacher to make qualitative judgments about the appropriateness, relevance, and goal-directed nature of the behavior. Investigators have used the Conners TRS as well as similar scales by Davids (1971), Blunden, Spring, and Greenberg (1974),

and Zukow, Zukow, and Bentler (1978) to select hyperactive children for research and clinical purposes. However, statistical deviance on the basis of qualitative and quantitative teacher norms is not enough to define hyperactivity adequately. Investigators like Stewart (Stewart & Olds, 1973) rule out such behaviors as descriptors of hyperactivity when they can be attributed to chronic medical or neurological disease or to severe behavioral disturbances such as childhood psychoses or mental retardation. In addition, the child's behavior should be viewed as problematic across situations (e.g., with different teachers). Finally, evidence should be obtained indicating that the hyperactive behaviors have persisted across time. With the exclusion of hyperactive children due to chronic disease and severe behavioral disturbances, and the emphasis on consistency in hyperactive behavior across time and situations, we are usually dealing with hyperactive children who are simply at the end of a normal distribution for activity and poor impulse control and inattention.

The complexity of the problem of hyperactivity for parents was well illustrated by Ross and Ross (1976) who compiled descriptions of behaviors commonly exhibited by hyperactive individuals across various age periods (see Table 1). As they emphasized, few hyperactive individuals exhibit the entire constellation of behaviors at any one age period. Rather, it is the *cumulative* effect of the number of problematic behaviors that leads parents and hyperactive individuals to seek professional help. Although it is true that excessive motoric activity level per se does *not* remain a distinguishing characteristic of an individual diagnosed hyperactive as a child throughout his or her life, it is clear that as many as one-third of the individuals diagnosed as hyperactive in childhood have very serious emotional and vocational problems as adults (Laufer, 1971; Ross & Ross, 1976).

#### *Differential Diagnosis*

One of the most difficult problems facing any clinician is differential diagnosis of hyperactivity

Table 1  
Behavioral Characteristics of Hyperactives

<i>Age</i>	<i>Description of child</i>
Infancy	Difficult and unpredictable Apoplectic to calm Querulous, irritable Rarely smiles Erratic sleep
Preschool	Sharp-temper Strong willed Excessively demanding Light sleeper Short attention span
Middle Childhood	Extremely active Difficulty sitting still Unable to remain seated during meal Distractible Light sleeper Often sad or depressed Poor school performance
Adolescence	Poor self-image Poor school performance Lack of social skills Rejection by parents and sibs Decrease in activity level Aggressiveness
Adulthood	Personality disorders Explosive personality Alcoholism

and aggressive conduct disorders. Although these two syndromes are clearly not totally independent, unless one wishes to argue that every "difficult" child should be medicated, differential diagnosis becomes a paramount concern. Unfortunately, nobody has devised an empirical scheme that can be used by a clinician to make such a differential diagnosis. In fact, the Conners TRS, the most widely used measure to assess responsiveness to treatment, has both an aggressive-conduct factor and a hyperactivity factor, but the correlation between these scales was found by Werry et al. (1975) to be .77. Given such a high correlation between factors, differential diagnosis is especially difficult.

Loney, Langhorne, and Paternite (1978) attacked the problem of differential diagnosis by first making a hypothetical distinction between primary or core symptoms (e.g., hyperactivity and inattention) and secondary or resultant

symptoms (e.g., self-esteem deficits and delinquent behavior) that were thought to arise from the hyperkinetic child's "flawed interactions with his/her environment." Using a sample of 135 boys from the ages of 4 to 12, ratings by two trained judges of primary, secondary, and unclassified marker symptoms were obtained. The raters used psychiatric, psychological, and social work reports to make their ratings. A factor analysis (principal axis with subsequent orthogonal rotation) yielded two relatively independent major factors, viz., aggression and hyperactivity. These factors had intercorrelations of only .27 (see Table 2 for a description of the variables which had significant loadings on Factors I and II).

To assess the concurrent validity of these factors, parent intake checklists and school report data were correlated with these factors. High scores on the aggression factor were significantly correlated with parents describing their children as inconsiderate, cruel, and quick-tempered, and with teachers describing them as defiant and stubborn and having temper outbursts. High scores on the hyperactivity factor correlated with parental descriptions of impulsivity and with teachers' descriptions of excessive demands for teacher attention, restlessness, overactivity, not being accepted by the peer group, and not being a leader. Further, the hyperactive boys had more visual motor difficulties and were more responsive to CNS stimulants. The aggressive boys were younger at referral and had fewer neurological signs. Thus, we find empirical confirmation by Loney et al. for a clinical picture of

Table 2  
Factor Loadings from Varimax-Rotated Factor Matrix

<i>Variable</i>	<i>Factor I (aggression)</i>	<i>Factor II (HA)</i>
Control deficits	.91	.14
Negative affect	.80	.12
Aggressive interpersonal relationships	.73	.07
Judgment deficits	.27	.62
Hyperactivity	.13	.60
Inattention	.06	.60

hyperactivity and aggressiveness that has been long proffered by individuals like Werry (1978).

A note of caution is in order. Loney et al. studied a population of boys who were labeled initially as MBD, and we do not know what results would be obtained with a more clearly mixed group of hyperactive, minimal brain dysfunction, and conduct problem children. Seventy percent of the sample were diagnosed Hyperkinetic Reaction of Childhood, whereas only 9% were diagnosed Unsocialized Aggressive Reaction or Adjustment Reaction.<sup>4</sup> Studies with populations representative of those in most clinical settings are clearly necessary before one could apply these results in a general clinical facility. However, this successful foray into differential diagnosis is especially promising and the identification of subgroups of children based on hyperactivity and aggression scores seems well worth pursuing.

The controversy over pharmacological treatment of hyperactive children, definitional problems, and differential diagnoses are some of the major issues that professionals must address. The applied researcher and the clinician, however, should be highly cognizant of the effects of behavioral and pharmacological treatments on hyperactive children. Thus, the effects of such treatments on social and academic behavior will now be examined.

#### *Effects on Social Behaviors: Psychostimulant Treatment*

The studies used to assess changes have included contrasted groups, crossover designs, and double blind evaluations, i.e., neither the observer nor the child knew whether a placebo or an active medication was being used. On the basis of teacher ratings, hyperactive children are judged more cooperative, attentive, and compliant when treated with psychostimulants (Conners & Werry, 1979, pp. 336-386). These studies have been replicated so often that it is

unnecessary to comment about them in any detail (for a recent review, see Cantwell & Carlson, 1978, pp. 171-207).

The particular social behaviors that change with psychostimulants have only recently been scrutinized with direct observational methodology, but it appears that movement, fidgeting, attention, and compliance are the most likely behaviors to be modified (Barkley, 1977). Interestingly, in contrast, the children become less initiating of social contact (Whalen, Henker, Collins, Finck, & Dotemoto, 1979). In brief, the effects of psychostimulants on increasing attention and decreasing classroom disruption are well established. However, it is not clear whether increased attention mediates all changes in social behavior or whether some social behaviors change directly with medication in situations in which attentional levels remain constant.

As noted above, the particular social behaviors that are affected by psychostimulants are not well understood. Until recently, few studies included direct observation of social behavior. Instead, teacher ratings were the primary dependent measures. The Whalen et al. (1979) study has not been replicated. Further, in that study the decrease in social initiation was seen in only one of two types of classroom activities, e.g., in a self-paced activity but not in a teacher-paced activity, and the reliability for occurrence of social initiations was relatively low. Finally, no standardized assessment measures were used for the diagnosis of hyperactivity.

#### *Effects on Social Behavior: Behavior Therapy*

Behavior therapy approaches emphasizing reinforcement of behavior in the classroom, teacher consultation, and home-based reinforcement have been shown repeatedly to lead to salutary changes in social behavior. Such changes have been obtained on standardized teacher ratings as well as on independent observations of classroom behavior (e.g., Ayllon, Layman, & Kandel, 1975; Gittelman-Klein, Klein, Abikoff,

<sup>4</sup>Personal communication, Jan Loney, November 10, 1978.

Katz, Gloisten, & Kates, 1976; K. D. O'Leary, Pelham, Rosenbaum, & Price, 1976; S. G. O'Leary & Pelham, 1978; Rosenbaum, O'Leary, & Jacob, 1975). On the other hand, behavior therapy researchers using a self-control or self-instructional approach with hyperactive children assessed with standardized measures have not found changes in social behavior in the classroom (e.g., Douglas, Parry, Marton, & Garson, 1976; Friedling & O'Leary, 1979; Bugental, Whalen, & Henker, 1977).

In brief, behavior therapy approaches emphasizing reinforcement of desired classroom behavior, teacher consultation, and parent consultation have shown consistent positive effects in studies ranging from 1 week to 5 months. The particular behaviors that are usually changed include: attention levels, completion of assignments, cooperation with peers, and disruptiveness.

*Effects on Academic Behaviors:  
Psychostimulant Treatment*

As mentioned earlier, psychostimulants have been used for approximately two decades and there are scores of studies in which changes on standardized achievement tests were assessed. The reasons psychostimulants were expected by many to influence achievement were that laboratory research had repeatedly revealed that attention spans of hyperactive children increased with psychostimulants, and some clinicians reported that school achievement increased (Bradley, 1937). Given the increased attention spans as well as reductions in overactivity and restlessness in classrooms, clinicians and researchers alike felt that the hyperactive children on psychostimulants would profit more from their classroom endeavors than hyperactive children not on such medication. In fact, many studies have indicated that teachers *perceive* hyperactive children as having improved "achievement" while on stimulant drugs. On the other hand, as Barkley and Cunningham (1978) noted, there is a sizable body of literature which suggests that increased achievement does not occur.

From short-term drug studies there is no consistent evidence across studies that children improve academically. However, as Sprague and Berger (in press), recently noted, many short-term studies are so brief (e.g., 8 weeks) that one would not expect achievement changes, given the means, standardized deviations, standard error of estimates of tests, and small number of items at each grade level (e.g., the WRAT). But, even in evaluations of moderate length (e.g., 3 to 6 months) where significant gains might be obtained, no consistent achievement gains on the WRAT have been associated with drug treatment (e.g., Conrad, Dworkin, Shai, & Tobiessen, 1971; Gittelman-Klein & Klein, 1976; Hoffman, Engelhardt, Margolis, Polizos, Waizer, & Rosenfeld, 1974).

As Rie and Rie (1977) noted, the effects of CNS stimulants that are sometimes cited are primarily due to enhanced attention during testing, not to a change in academic skills. This point was made salient in their research in which "achievement test gains" were seen immediately upon a trial of psychostimulants. The long-term effects of psychostimulant medication are even less clear than short-term effects because none of the studies meets most experimental design criteria. Most of the long-term studies in which children had been assessed on psychostimulants are simply follow-up studies, and comparisons were made with children who did not accept psychostimulant treatment or with children who had discontinued treatment. An exception is the work of Weiss, Kluger, Danielson, and Elman (1975) who compared children (matched for age, sex, IQ, and SES) who were treated with methylphenidate (Ritalin) or chlorpromazine (Thorazine) with children who received medication for less than 4 months, i.e., the nondrug group. The children in the drug groups received medication for 3 to 5 years, and follow-up evaluations were made 5 years after termination of medication use. Even this study was plagued by non-random assignment, treatment for one drug group at a time different from another, and



nonequivalence of groups at the outset of the study. Even accepting these problems, there have been no long-term studies in which hyperactive children with psychostimulants fare better than those who do not receive such medication.

The comments of the investigators themselves are especially interesting. Weiss et al. (1975) said: "Perhaps our findings can be summarized by suggesting that we initially expected too much from any one drug or from any one method of treatment of hyperactive children. . . . Although the hyperactive child on stimulants generally becomes easier to handle, his outcome may be only slightly or not at all affected. . . . It was wishful thinking on our part that a useful drug alone would change the outcome of a fairly serious condition like severe chronic hyperactivity" (p. 164). Riddle and Rapoport (1976) commenting on their 2-year follow-up of 72 hyperactive boys said: "The continued difficulties . . . in spite of faithful stimulant drug intake, ancillary educational and psychiatric support are disappointing. . . . An 'optimally medicated' group had almost identical academic achievement and social acceptance as did a group of drop-outs from drug treatment or the sample as a whole" (p. 126).

In summary, psychostimulants have been shown repeatedly and consistently to influence social behavior in classrooms and attentional behavior in laboratory situations on a short-term basis. Ratings and objective measures of attention and concentration almost always show salutary changes. Given the academic achievement measures used in most short-term classroom studies to date (6 to 8 weeks), one would not expect, nor does one find, significant changes in academic achievement over these brief intervals of treatment with psychostimulants. However, in the studies of 4 to 6 months duration where academic achievement gains might be expected, positive results have not been obtained either. Even the investigators who have conducted the long-term drug studies and have followed up hyperactive children who were on medication

for a number of years feel that there is ample reason for skepticism regarding the efficacy of long-term psychostimulant use on academic achievement. Although we cannot argue that hyperactive children treated with CNS stimulants do better academically than those not so treated, it is premature to say that they could not. There is a critical need for carefully controlled, long-term, outcome research.

#### *Effects on Academic Behavior: Behavioral Treatment*

Most behavioral treatment studies have not used standardized measures of academic achievement because, at least in our own research, we would not have expected significant increases on standardized achievement tests such as the WRAT or CAT in 1 to 3 months. There have, however, been assessments of daily or weekly academic production rates, and when hyperactive children are placed in home-based or classroom-based reinforcement programs, academic production rates increase (Ayllon et al., 1975; Wolraich, Drummond, Salomon, O'Brien, & Sivage, 1978). Such increases are certainly not surprising because many behavior therapists try to choose academic behaviors for at least half of the targets for intervention. This increased emphasis on academic targets has been fairly common since the criticisms of Winett and Winkler (1972) and the reports that there often was little increase in academic production when behaviors like disruptiveness decreased and attention level increased (see review of K. D. O'Leary & S. G. O'Leary, 1977).

There is suggestive evidence that hyperactive children's achievement is significantly improved as a result of self-instructional training (Douglas et al., 1976). In a 3-month self-control program supplemented with direct instruction and contingency management, the treated children showed significantly greater gains on laboratory and achievement tests than untreated controls. On the other hand, Friedling and O'Leary (1979) failed to find evidence for the utility of self-instruction training with hyperactives on

academic tasks. Self-instructional training appears to influence impulsive behavior of children on laboratory tasks, but whether it contributes significantly to academic achievement of hyperactive children is not clear. There is a critical need for replication and extensions of behavioral treatments for periods of at least 6 to 12 months so that we can decide if such programs can effect academic changes on standardized achievement tests. However, given that daily and weekly assignment-completion have increased with behavioral programs for hyperactive children, given that improvements on standardized achievement tests have occurred with self-instructional training, and given that we have found changes on standardized tests with children labeled Conduct Disorder (Kent & O'Leary, 1976), it seems very likely that a behavioral treatment program for hyperactive children could lead to long-range academic and social changes.

*Pills or Skills: Is It an Either-Or Question?*

In the last few years, it has become apparent that psychostimulant treatment is not a cure for hyperactivity (Conners, Denhoff, Millichap, & S. G. O'Leary, 1978). Furthermore, psychostimulant treatment has physical side effects such as increased heart and blood pressure rates and, in some instances—though clearly not all—it appears that growth rates have been suppressed (Roche, Lipman, Overall, & Hung, in press; Safer, Allen, & Barr, 1972; Weiss et al., 1975). Classroom disruptiveness decreases but some cognitive functions (e.g., memory, Sprague & Sleator, 1977; Sprague & Berger, in press; learning, Swanson, Kinsbourne, Roberts, & Zucker, 1978) may be impaired with commonly administered dosages of Ritalin. Approximately 70% of hyperactive children are clearly more "manageable" on medication, but the long-range social and academic effects of such treatment are not clear. The long-term studies do not enable us to make an unequivocal conclusion about long-term medication use, but the sole use of psychostimulant medication as a treatment is in-

creasingly questioned by members of all mental health groups, and the follow-up studies conducted thus far do not give us great hopes for CNS treatment alone.

Behavior therapy has shown salutary changes on both academic and social behavior in studies of 1 to 4 months, but no long-term treatment studies have been conducted with hyperactive children. However, based on the long-term treatment research with conduct problem children (Kent & O'Leary, 1976), the successful transfer of hyperactive children from pharmacological to behavioral treatment (S. G. O'Leary & Pelham, 1978), the academic gains with hyperactive children in behavioral programs (Ayllon et al., 1975; Douglas et al., 1976), there is ample reason to be optimistic about the viability of a behavioral approach. This optimism must be tempered by the fact that Kent and O'Leary did not work with children specifically diagnosed as hyperactive, although as noted earlier, the overlap between hyperactivity and conduct problems/aggression is very great. Secondly, cautious optimism is in order since the total number of treated subjects in the three behavioral studies showing academic gains with hyperactive children was only 41 (Ayllon et al., 1975, 3; Douglas et al., 1976, 18; Wolraich et al., 1978, 20). Further, Gittelman-Klein et al. (1976) showed superiority of pharmacological interventions over an 8-week behavioral treatment program as judged by classroom observations and teacher ratings.

Regardless of one's theoretical or empirical predilections on occasion behavioral interventions may have to be supplemented with psychostimulants. For example, if the child is especially inattentive and is unresponsive to varied behavioral interventions, a combination of medication and behavioral interventions may be advised (Conners et al., 1978). In fact, Satterfield, Cantwell, and Satterfield (1979) found that a combination of pharmacological and psychotherapeutic approaches was associated with "an unexpectedly good outcome." More specifically, a year-long program of methylphenidate

and a combination of psychodynamic and behavior therapy for families was associated with clear social *and* academic improvement. Of special interest was the investigators' goal to prescribe dosages as low as possible that were still sufficient to benefit the child. The average dosage was 25 mg at the end of one year of treatment for boys who were primarily between 8 to 12 years old. In a related vein, Pelham, Schnedler, Bologna, and Contreras (in press) provided suggestive evidence that a combination of psychostimulant medication and behavior therapy may be more effective than either treatment alone for hyperactive children in school settings.

There are occasions when parents are so plagued by their own personal and/or marital problems or are so angry at their child because of difficulties encountered with him or her that they could not help implement a program for their hyperactive child. Then, in these cases, psychostimulant medication would be advised as a temporary alternative or adjunct to behavior therapy. Use of psychostimulant medication in some cases may lead to decreased marital tension caused or exacerbated by a hyperactive child, and the parents may later be more able to implement a behavioral program. However, it has been my experience that teachers often see little need for psychological or educational intervention after placing their child on psychostimulants. I would not initially use pharmacological interventions with most hyperactive children because the behaviors that characterize the hyperactive syndrome are so dramatically, although fleetingly, changed by psychostimulants that the parents, teachers, and children may view the medication as a panacea and we know that such is very far from the truth.

#### *Suggested Research Directions*

Assessment research, especially differential assessment of hyperactive versus aggressive children, is sorely needed. If these two groups cannot be reliably differentiated, arguments will abound regarding whether all children with problems

of hyperactivity and aggression should be treated with psychostimulants (cf. Winsberg, Yepes, & Bialer, 1976).

Replications of the Sprague and Sleator (1977) and Swanson et al., (1978) studies are needed, for if memory and learning are really impaired with commonly administered dosages of Ritalin, the failure of the children to show improvement on academic achievement tasks may be more readily understood.

Long-term treatment research comparing behavioral and pharmacological interventions and combinations thereof with multiple dependent measures in the school and home is critical if we are to address many questions raised in this manuscript. A multiclinic study of the scope of the NIMH depression study to start in 1980 is certainly in order (Weinckowski & Pardes, 1978). Both pharmacological and behavioral treatments have documented efficacy and researchers feel they both have long-term promise. However, single researchers or single research teams cannot well address long- and short-term treatment efficacy problems. A large-scale multiclinic research effort is now needed, and greater emphasis should be placed on: (1) academic changes as assessed by teacher ratings and standardized achievement tests, (2) family changes as assessed by after-school ratings and observations and assessment of marital discord and family discord, (3) detailed cost analyses of treatment programs, and (4) consumer satisfactions with the treatments (e.g., child, parent, teacher, and tutor). To address these emphases is beyond the scope of a single investigating team. Further, replicability across treatment sites is needed to arrive at unequivocal conclusions, and few, if any, research teams have the clinical and research capabilities to address these emphases well. At a minimum, researchers from different sites should coordinate their efforts to begin to allow us to reach conclusions that are not plagued by idiosyncracies of particular therapists, programs, or contextual variables (e.g., cooperation from school board or superintendent).

Individual subject analyses could be very profitable in determining parametric effects of medication and environmental events. For example, the finding of Whalen et al. (1979) regarding decreases in social contact of other children to children on medication and the finding by Barkley and Cunningham (1978) that medicated children decrease their initiation of mother contacts should be pursued in varied contexts with varied dosages of medication. The replicability and *magnitude* of these effects should be clearly delineated and explicated for clinicians.

Hyperactive children are indistinguishable from randomly selected same-sex peers in certain situations characterized by little restraint in terms of task demands (Jacob, O'Leary, & Rosenblad, 1978). It would be of interest to ascertain whether the hyperactive children view themselves more positively in those situations than in those characterized by higher task demands. Further, the peers of the hyperactive children might view the hyperactive child quite differently in situations with varied task demands. If salutary social effects were obtained in situations more like open classrooms, of course, the questions of relative academic achievement in the two situations would have to be addressed.

The research by Shetty (1971) and Rapoport et al. (1978) on the short-term effects of psychostimulants on normal and hyperactive children was especially important from a theoretical standpoint. The study was important because both groups of children showed similar salutary behavioral changes. Such results should lead us to question seriously the models that purport that hyperactivity results from brain dysfunction which is differentially improved by medication. These efforts clearly warrant replication and extension.

The field of applied behavior analysis has gained a reputation for scrutiny of effects on individual subjects. As one moves from the more dramatic behavior change procedures (e.g., use of Ritalin or use of a home-based token rein-

forcement program), it is often tempting to use research strategies employing large numbers of subjects so that even small effects may be detected with statistical analyses. Such a research strategy is often useful in hypothesis formation and in analyzing effects of variables which interact with others. However, the practitioner needs to know about the magnitude of effects for certain treatments for individual subjects and careful documentation of such continues to be in order even when large-scale group design research is employed.

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