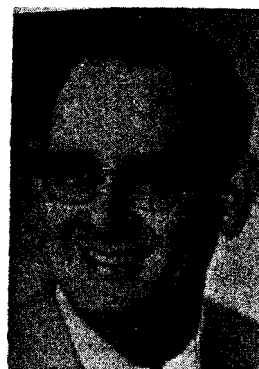


An Orthomolecular Study of Psychotic Children

BERNARD RIMLAND, Ph.D. 1

One of the functions of the Institute for Child Behavior Research in San Diego is to serve as an information clearinghouse for parents and professionals around the world who are interested in research on the cause and treatment of severe behavior disorders in children. Each year the Institute receives letters and phone calls from thousands of people from all over the world asking for information and telling us what has and has not worked to help their child or the children with whom they are concerned. An amazing variety of ideas has been tried out - ranging from music and shadow-therapy through psychotherapy and operant conditioning, to colonic irrigations, spinal adjustments, and rage reduction therapy." It doesn't take long to develop a skeptical attitude about most of these breakthroughs."

In the mid 1960s, I began to hear from various parents who had started to experiment on their Own mentally ill children, using quite large amounts of certain harmless, water-soluble vitamins. These unhappy people would write to me about the bitter disappointment and discouragement they had experienced with the usual treatment methods, such as psychotherapy and psychoanalysis,



which have repeatedly been found to be useless yet which continue to be practiced, at great expense to the families. They would then tell me they had read articles in the New York Times and elsewhere about the work of Drs. Abram Hoffer and Humphry Osmond, who were reporting good results when they used massive dosages of certain vitamins on adult schizophrenics and had decided to experiment on their own after determining there was no danger.

At first I was quite skeptical about the reports that some of the parents sent me about the improvement they saw in their sick children. As you may know, these children spurt ahead or fall apart periodically for no discernible reason, and whatever treatment is being used at the time gets the credit, or the blame. Rut as the letters accumulated, I became more interested in the reports. For one thing, the parents were often reporting changes in behavior that were clearly tied to the raising or lowering of the dosage level of one or more of the vitamins. Also, even though few of the parents *were* acquainted with each other and each was trying quite a variety of vitamins, the same small group of vitamins *were* being mentioned again and again. As the number of parent-experimenters grew, it began to include more parents whom I knew personally to be intelligent and reliable people. At that

1 Institute for Child Behavior Research, 4758 Edgeware Road, San Diego, Ca. 92116

point I contacted a number of doctors in California and on the East Coast who I knew had been experimenting with vitamin therapy. The combined information from the doctors and parents convinced me that I could not in good conscience fail to pursue this lead. I was of course aware that my working on the vitamin approach would create much hostility against me among many authorities in the medical world who were totally and irrevocably convinced that the use of vitamins would not be helpful.

Before going on to describe the vitamin study itself, let me discuss a few important related points.

First there is the often-voiced concern about safety. With the exception of vitamins A and D, which can in some people be harmful if taken in very large doses for an extended time, there is little or no danger in taking large quantities of vitamins. Most vitamins are soluble in water, and the body merely excretes what it doesn't use. The vitamins are immeasurably safer than the drugs which are routinely given to children. A recent report has shown, for example, a relationship between medically administered amphetamines and the later occurrence of Hodgkin's disease (Newell et al., 1973).

Second, the commonly held belief that everyone gets all the vitamins he needs by eating a normal diet should be recognized as sheer nonsense. Most of us can get along reasonably well, apparently, without supplementing our vitamin intake, but even among normal, well-functioning people there is an enormous range of individuality in vitamin needs. A range of 2,000 percent in vitamin requirements from one healthy person to another is not uncommon, as biochemist Roger Williams (1956) has pointed out in his book **Biochemical Individuality** and elsewhere. Additionally, there are well-known disorders which stem from just such differences between people in vitamin requirements. These are

called vitamin-dependency conditions, as differentiated from the vitamin-deficiency condition of a normal person on a poor diet. Every physician is acquainted with vitamin D-resistant rickets, where the child sometimes needs hundreds of times as much vitamin D as the normal child. Since 1954, about 16 inherited diseases have been discovered which require massive dosages of one or another vitamin as the major form of treatment (Rosenberg, 1970). Who can say, in the absence of contrary information, that anyone of us, or any sick person, is not the victim of just such a genetic vitamin dependency?

Third, and again contrary to widespread belief, there is a sizable body of scientific literature, including both control group studies of vitamin effectiveness and laboratory studies on vitamin metabolism, which demonstrates beyond any doubt that at least some forms of what is called mental illness are closely linked to biochemical errors in the body. For those interested in learning more about these matters, let me recommend the recent book **Orthomolecular Psychiatry** edited by David R. Hawkins and Linus Pauling. My chapter in that book (Rimland, 1973) provides not only a more comprehensive report of the ICBR vitamin study than can be presented here, but also presents an extensive review of the scientific literature on vitamin therapy of mental illness, especially as it pertains to children. If anyone tells you that there is no scientific basis for believing that high dosages of vitamins may be useful in treating mental illness, he is simply admitting that he has not done his homework. There is by now a substantial and impressive body of data on the subject.

After deciding to investigate the problem, I sent a questionnaire to the approximately 1,000 parents and professionals then on the Institute mailing list to locate as many people as possible who had tried the vitamin approach. By analyzing the data from the 57 parents and seven physicians who responded in detail, we evolved the selection of

vitamins and dosages used in our study.

After consulting several nutritionists, biochemically-oriented psychiatrists, and biochemists, we decided to start with a potent multiple-B vitamin tablet plus several grams per day of vitamin C. After two weeks, two B vitamins, niacinamide and Pyridoxine, were added, each in quantities several hundred times the usual dosage. Finally, after two more weeks, mega dose amounts of pantothenic acid (another B vitamin) were added. The actual dosage levels used were determined by the weight of the child. The subjects of the study were the children of the several hundred parents from various parts of the U.S. and Canada who indicated, in response to our mail survey, that they would like to participate and could find a local physician willing to cooperate.

The study took about 4¹/₂ months per child. After three months on the vitamins, a "no-treatment" period was scheduled so that any changes resulting from discontinuance of the vitamins could be observed. The vitamins were then reinstated briefly as the final stage in our design. The parents completed a simple one-page form describing the child's status every two weeks, and every month a similar form was completed by the child's physician. The parents also completed a more intensive questionnaire at the conclusion of their child's participation in the study.

Although all the vitamins used were well established as being nontoxic, even in large quantities, we required the parents to obtain the participation of a physician of their choice, both to guard against the possibility of an adverse reaction and also to provide an independent opinion on the child's response to the vitamins.

The findings I will report are based on the first 191 children for whom we received complete data, including the final report. There is a large amount of information for every child in the study: detailed, periodic doctor and parent ratings on speech, eating, sleeping, tantrums, alertness, and so forth, as well

as an extensive tabulation of positive and negative side effects. These data occupy some 20 IBM cards per child. To analyze them will require a great deal of time and effort. Our initial analysis was based on only a single two-digit score, ranging from a possible 99 (indicating phenomenal improvement) to a possible 10 (indicating great deterioration of behavior) These overall improvement scores were assigned and independently checked by two judges, after intensive study of all parent and doctor reports for each child. Discrepant or ambiguous ratings were resolved by discussion or excluded from the analysis.

Before giving you the results of the statistical analysis, I must tell you the rationale underlying our rather unusual experimental design.

Our decision to use a design other than the traditional control-group-and-place-bo design has attracted a good deal of criticism from people who do not realize that there may be better alternatives. There are many reasons for deciding against the traditional design. My chapter in **Orthomolecular Psychiatry** discusses some shortcomings of the double-blind. The most important reason is that this design presupposes that the subjects constitute a homogeneous group.

I am firmly convinced that very little progress may be expected in finding cause and treatment for mental illness in children until the total group of children now loosely called "autistic," "schizophrenic," "psychotic," or "severely emotionally disturbed," can be subdivided in a scientific way into smaller homogeneous subgroups (Rimland, 1964, 1971). Leo Kanner, the man who discovered and named "infantile autism," has pointed out that for centuries medicine could make no progress against the disease known as "the fevers." It was not until "the fevers" were broken down into separate syndromes or disease entities such as malaria, diphtheria, tuberculosis, cholera, etc., that progress could be made toward finding causes and cures. Mental retardation provides an

example closer to home—until it became possible to fractionate the mass of "retardates" into smaller groups such as PKU, cretinism, galactosemia, mongolism, etc., it was hopeless to try to devise means of prevention or treatment.

I believe the children loosely called "autistic" or "schizophrenic" actually represent a dozen or more different diseases or disorders, each with its own cause (Rimland, 1971). It is essential that we develop the means for finding the various subtypes of autistic-type children. I have been involved in research on this problem for many years. Computer technology is beginning to provide useful ways of approaching the problem of classification.

For each child enrolled in the vitamin study, we had required the completion of several research questionnaires by the parents, including our diagnostic questionnaire, Form E-2. Form E-2 consists of over 100 detailed questions, to be completed by the parents, covering the child's medical and birth history, symptomatology, and other information. E-2 was designed for computer analysis. Our hypothesis in the vitamin study was that only certain subgroups of the children would be helped, while other subgroups, because the cause of their problem was not related to their vitamin requirements, would show no benefits. We assumed that the information on Form E-2, while by no means exhaustive, was sufficient to permit a computer to classify the children into clusters that would show differential response to the vitamins.

I will not trouble you here with the many details of the statistical analysis. Briefly, through the use of highly sophisticated computer programs various collaborating researchers were able to identify subgroups of children helped by the vitamins. For instance, using his computer program **Normix**, John H. Wolfe of the Naval Personnel and Training Research Laboratory in San Diego was able to classify the 191 children into six homogeneous subgroups or clusters. The clusters were formed without information on how well the

children had responded to the vitamins. Only after the clusters were formed were the vitamin improvement scores entered into the computer so that the mean improvement score for each cluster could be determined.

The differences between the mean improvement scores for the six groups were found to be significant at the .02 level. That is, there was only one chance in 50 that the group means would be found to be so different if the vitamins did not in fact influence the improvement scores. It may thus be said with a high degree of assurance that the vitamin treatment does in fact importantly influence the behavior of certain children. As predicted, certain subgroups of children responded much more strongly than others.

Similar analyses were performed on our data by Dr. James Cameron of Napa State Hospital in California, and by Drs. Raymond Christal and Janos Kopyay of the Lackland Air Force Base in Texas. These analyses also produced results which were highly statistically significant. There is no reasonable explanation for these findings other than that the vitamins do help some children.

One of the chief advantages of the type of design we used is that now we know that we can take the more than 4,000 E-2 forms on file at our Institute, subject them to computer analysis, and tell with a reasonable degree of accuracy whether each child is or is not likely to benefit if placed on the vitamin regime we used.

The next step in our analysis of the data collected on our group of 191 children will be to do a fine-grained computer analysis of the findings to see if we can determine which vitamins were most helpful for each subgroup. Our use of megadose levels of four vitamins was in effect a "shotgun" approach, and now we need to narrow our aim.

Table 1 summarizes the findings of the megavitamin study.

While the vitamin study was in

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TABLE 1 Summary of Results of Megavitamin Study

Treated with Megavitamins	Total	No. Def. Effect	Possibly Helped a Little		Some Impr.	Def. Helped	Total	Made a Little Worse	Made Much Worse	Total
N %	191 100%	20 10.4	37 19.4	57 19.4	41 21.5	86 45.0	127 45.0	4 2.1	3 1.6	7 3.7

progress, our Institute was also collecting data for an evaluation of 14 drugs commonly used with autistic and autistic-type children. The data were collected by mail questionnaires from parents in all parts of the U.S. The drugs and dosages were as prescribed by each child's physician, and our role was merely to collect and tabulate the child's response, as assessed by the parents. Table 2 presents a summary of the results of the drug study and has been set up to facilitate comparison of the drugs and the vitamins.

Inspection of Table 2 shows that the vitamins are not only far more likely to be helpful than the drugs, they are also far less likely to cause any kind of harm—behavioral or physical.

The findings in Table 2 are of special interest in view of the criticism of our vitamin study commonly made by people who do not

understand the experimental design of our study. Some of our critics have suggested that our findings reflect only wishful thinking—they assert that our positive results might stem from the fact that many parents would be inclined to over-rate the vitamins because they want so badly to see their child improve. This criticism is not valid, since parent expectation could not influence the computer grouping, but if it were valid, the same spurious effect should be seen in the parent's assessment of the drugs. It is not. Since there is clearly much more improvement reported for the vitamins than for the drugs, the argument that our vitamin findings reflect only wishful thinking by the parents must be rejected on these additional grounds. Note also that the drugs were specifically prescribed for each child by his own physician, while the vitamins were uniformly given to all the children, the dosage depending solely on body weight.

TABLE 2

Comparison of Parent Ratings of Effectiveness of All Drugs; Best Drug (Mellaril) and Vitamins

Treatment Tot.	No. Def. Effect	Possibly Helped A Little		Some Impr.	Def. Helped	Tot.	Made A Little Worse	Made Much Worse	Tot.
All Drugs 1591 (Average Drug) 100%	402 25.3	324 20.3	726 45.6	202 12.7	238 14.9	440 27.7	209 13.1	216 13.6	425 26.7
Best Drug 277 (Mellaril) 100%	60 21.7	61 22.0	121 43.7	57 20.6	44 15.8	101 36.4	31 11.2	24 8.7	55 19.9
High Dosage 191 vitamins 100%	20 10.4	37 19.4	57 29.8	41 21.5	86 45.0	127 66.5	4 2.1	3 1.6	7 3.7

A quite unexpected side benefit of the vitamins was, in many cases, an improvement in the child's physical well-being. Many parents reported such things as improved skin condition or hair texture, better muscle tone, and the cessation of teeth grinding. But of course, what is of most interest is the behavioral improvement that constituted the basic reason for doing this study. In many children the improvement was striking. It shows up most clearly in contrasting the behavior of the child during the several months he was on the vitamins—during which time there was often a gradual improvement—with his behavior during the no-treatment period when the vitamins were suddenly stopped. Here are a few examples of such changes as reported by the parents:

"Frustration level extremely high without the vitamins. Much yelling and irritability. Has to be given directions three times instead of once. Changes were evident after three days of no vitamins and grew worse each subsequent day...I resumed vitamins on the 14th day."

"On August 5th (10th day of no-treatment period) both parents, who had been keeping separate notes, agreed that marked deterioration of behavior had occurred. William seemed to have withdrawn into himself; he no longer exhibited the lively interest in the world around him that had marked the previous month. His newfound willingness to cooperate and to obey such directions as he understood disappeared rapidly. His old repertoire of mannerisms and bizarre hand motions and positions, which had been waning, reasserted itself with a vengeance...."

"Harriet seems to be progressively less social with us. She is starting to retreat to her room for longer periods, as she did before she started the vitamin therapy."

"Mary has been off the vitamins for two weeks. Her speech hasn't deteriorated, but all the annoying noises...have returned. Her skin tone isn't as good and the slightly bluish transparency to her facial skin is again noticeable. She is having trouble focusing her

eyes and the pupils appear dilated and her expression is far off and dreamy, jaw slack...."

"He stopped taking the vitamins exactly five days ago. I never expected the definite reaction that has gradually shown up without a doubt during these last five days—slowly at first and then increasing at an amazing rate. His doctor is on vacation and we cannot see the substitute doctor until next Thursday. However, I took it upon myself this morning to start him again on the complete dosage. I only hope it will relieve his present symptoms soon, symptoms that cannot be traced to anything short of not having the vitamins for these few days."

"He gradually showed improvement in every area on the check list—even those I may have noted as no behavioral improvement because now in those areas he has badly regressed. He is agitated and crying practically all the time, shaking nervously, hiding under blankets, tapping things with spoons, getting into things he hasn't been getting into and that he shouldn't get into, eating poorly and away from the family table, making continuous odd noises and seems to be suffering physically from some internal misery. Without a doubt, I trace his former improvement to the vitamins. He became calmer, seemed normal in public, didn't make noises, and verbalized sensibly, socialized more, was very much, much better."

The foregoing are just a sample of the reports in our files. There are many, many more. Also impressive, beyond the statistical data, are the reports we received from teachers who had documented improvement in their records when the children were on the vitamins and deterioration when the children were taken off the vitamins—and these were teachers who had no idea whatever that the children were in our study or that the children were on or off treatment at any point in time. We had asked the parents to keep secret from the school the child's being in the study until it was over.

Earlier I mentioned the fact that some of the children had shown adverse effects

from the vitamins. A small number of children became irritable, hyperactive, sensitive to sounds, and enuretic when placed on the vitamins. These effects quickly disappeared when the parents stopped the vitamins. This puzzled us. The professors at the University Medical School were of no help. The answer came in the form of a phone call from the well-known nutritionist, Adelle Davis, who had served as a consultant during our planning sessions. Adelle wanted to know the details of our study so she could include them in her then-in-preparation book **Let's Have Healthy Children**. When I told her what vitamins we were using, and at what levels, she reminded me that she had long before urged that we include the mineral magnesium in our regime: "Where is the magnesium I told you to use?"

Somewhat embarrassed, I explained that each child was already taking a whole handful of tablets, and adding magnesium would just add several more to the total.

"Well," she said, "you'll have problems if you don't."

"What kind of problems?" I asked.

Her reply astounded me, "Irritability, sound sensitivity, enuresis."

She was perfectly on-target! It seems that certain of the vitamins (B6 in particular) combine with the magnesium in the body in order to perform their functions, and by adding the B6 without the supplemental magnesium we

were creating a relative deficiency of magnesium. The symptoms the children were experiencing were those of mild magnesium deficiency.

This incident illustrates two points: first, that certain dysnutritional conditions produce highly predictable behavioral manifestations, and second that the megavitamin treatment can be quite complex, if done correctly. We would no doubt have had even better results from our study had we included magnesium, and perhaps zinc and other trace minerals. Today we know only a little of what there is to learn about the megavitamin approach, but we are learning constantly, and that is what will count in the long run.

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