

Failure to Confirm an Hypothesis Based on Watson's Psychochemical Typology

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Many of the theories behind so-called "Orthomolecular" treatment are so complex as to make testing them difficult, if not impossible. By contrast, a theory proposed by Watson in a series of papers (Watson, 1960, 1957; Watson and Comrey, 1954; and Watson and Currier, 1960) and in a book entitled **Nutrition and Your Mind —The Psychochemical Response** (1972) is fairly explicit and seems to lend itself to empirical evaluation. On the basis of detailed metabolic analyses of over 200 patients in the past 20 years, Watson divided his patients into two metabolic types. Watson originally made this distinction on the basis of patients' responses to various Orthomolecular vitamin-mineral treatment regimens, but retrospectively found that these correlated with determinations of venous plasma pH, CO₂ and H₂CO₃, total lipids, and fasting blood sugar. Watson labels these Psychochemical types as Type I with high pH (slow oxidizers) and Type II with low pH (fast oxidizers).

Watson's theory states that Type I slow oxidizers are supposed to metabolize fats and ketogenic amino acids faster than carbohydrates and glucogenic amino acids. The vitamins and minerals that ameliorate a Type I patient's symptoms (folic acid, niacin, thiamine) are generally cofactors at key steps in the Krebs' and Embden-Meyeroff cycles that favor the utilization of the under-utilized carbohydrates and glucogenic amino acids. The pathophysiology of Type II is the reverse of Type I, and the main Orthomolecular treatments (pantothenic acid, choline, nicotinamide) act to increase utilization of fats and ketogenic amino acids. A more complete discussion of these issues is supplied by Watson in his book. Watson further claims that a food preference and reaction list (the Psychochemical Profile) can generally determine if someone suffers from a Type I or Type II abnormality. The published form of the questionnaire (Watson, 1972, p. 74) was derived from the study of Watson's series of 200 patients and is a simplified version of the research test, which has not been published.

Conventional metabolic experts raise the objection that venous pH, which Watson claims is the single most important classificatory test, is an un-

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reliable measure of metabolism. However, the failure to use the most up-to-date techniques does not preclude one from making a valuable clinical observation, and we decided to see if we could repeat some of Watson's observations. After we consulted with Dr. Watson, we decided first to determine the frequency of Type I and Type II cases in our clinical population, both by venous pH and by Watson's published food preference list, prior to considering the possibility of clinical trials.

METHODS

Venous plasma pH was determined on 81 consecutive admissions to the Clinical Research Ward at the Langley Porter Neuropsychiatric Institute. These values were determined within 72 hours of hospitalization, and during this time patients were receiving the regular hospital diet (i.e., they were able to accept or reject specific foods as they would normally). In addition, patients had access to a variety of food-dispensing machines and could have friends or relatives leave favorite treats with them on the ward. One patient entered the ward after a self-administered starvation diet, but repeated pH determinations remained constant for three months (pH was 7.30 on three occasions).

After plasma pH was determined, patients with pH values below 7.35 or above 7.45 were given the Psycho-chemical Profile to fill out. These pH ranges were selected on the basis of Watson's work (Watson, 1972, p. 154), in which 20 ambulatory psychiatric patients were examined and found to be either Type I slow oxidizers (pH range 7.49 to 7.56) or Type II fast oxidizers (pH range 7.33 to 7.40) on the basis of their pH values.

The Psychochemical Profile is a questionnaire with 52 items, consisting of statements regarding food preference ("steak for breakfast sounds pretty good to me") followed by the subject's check under one of three responses: "always or very often," "sometimes," or "rarely or never." In general, subjects were given the Profile after the

midpoint of their hospitalization, when they were well able to attend to the task. They were told to answer questions according to their usual preferences in foods.

According to the scoring criteria, the 52 responses are sorted so that Type I slow oxidizers respond "always or very often" to at least 17 of the 21 slow oxidizer items, while fast oxidizers respond "always or very often" to 25 or more of the 31 fast oxidizer items.

Diagnoses were obtained from the patient's inpatient record, which contained the diagnostic impression of the first-year resident and the senior clinician on the ward. Roughly 65 percent of the total population was schizophrenic, the majority of the rest being diagnosed as having affective illness.

RESULTS

Of the 81 patients tested over the course of nine months, three were classified as Type I, with pH values exceeding 7.45 (roughly 4 percent), and eight were classified as Type II, with values below 7.35 (roughly 10 percent). Table 1 summarizes these results.

Next, we examined the Psycho-chemical Profile results of those patients with Types I and II pH values, along with the 20 randomly selected patients with normal venous pH who were given the Profile. The most striking result is that none of the 31 patients, including 11 with clearly aberrant pH's, was scored as either a Type I or II according to the Watson criteria.

Although there were no statistically significant differences in mean number of fast and slow responses between any pair of groups, the evident trends are generally in the opposite-than-hypothesized direction. Thus, patients classified as Type I slow oxidizers by venous pH had lower frequencies of slow oxidizer Profile responses than normal pH patients. The pH-determined Type II fast oxidizers had fewer Profile fast responses than the slow oxidizers (based on pH) or

the normal pH patients. See Table 2.

TABLE 1

Incidence of Type I and Type II Patients Classified by Venous pH

Type I Slow Oxidizers	Type II	
	Fast Oxidizers High pH (>7.45)	Low pH (<7.35)
N	3	8
% of patients studied	4%	10%
pH mean SD	7.48 (0.02)	7.32 (0.02)
Diagnosis schiz. affective	2 1	6 2

DISCUSSION

Watson's claim that his Psycho-chemical Profile distinguishes between Type I slow oxidizers with high pH's and Type II fast oxidizers with low pH's receives no support from our study. In fact, none of the patients with clearly abnormal pH's (less than 7.35 or more than 7.45) was distinguishable from normal pH patients (pH between 7.35 and 7.45) on the basis of Watson's criteria from his Profile. While it

might be argued that Watson's Type I/Type II distinction is partly derived from tests not used in our study (lipid levels, blood sugars, etc.), he is quite clear in selecting pH as the single most useful test. Also, his book gives the impression that the published Profile can be used alone in determining one's Psychochemical Type, and specific dietary treatments are outlined. Thus, Watson's Psycho-chemical Profile is not a useful test for identifying patients with extreme pH values from admissions to an inpatient psychiatric service.

Watson's rates of finding disordered pH values in psychiatric patients also differ significantly from our findings. In 81 patients we found high pH's (above 7.45) in 4 percent and low pH's (below 7.35) in 10 percent. By using the same pH criteria applied to Watson's data (Watson, 1972) in a series of 48 patients, 46 percent had high pH's and 2 percent had low pH's. This striking difference in rates of altered pH values may reflect the difference between our inpatient group and Watson's population of ambulatory patients, although the percentage of schizophrenics in his sample seems similar to ours (between 50 percent and

TABLE 2

Psychochemical Profile Scores of Patients Categorized by Venous pH

Type I Slow Oxidizers	Fast Oxidizers	Normal Range pH	High pH (>7.45)	Type II LowpH(<7.35)	Patients with (7.35to7.45)
N		3		8	20
Mean number of fast responses on Profile		6.33		6.00	7.74
SD		(5.13)		(4.86)	(3.86)
Mean number of slow responses on Profile		5.67		4.67	6.26
SD		(2.08)		(3.44)	(3.14)

70 percent). In any case, the findings confirm the presence of a subpopulation of patients with altered venous pH values, and this in itself is a finding awaiting analysis and explanation. It is worth noting that in one patient with repeatedly low venous pH determinations, arterial pH was normal.

From the popularity of many Orthomolecular treatment regimens, it is increasingly clear that offhand academic dismissal of these claims will no longer suffice to discourage people from trying treatments that purport to offer relief from troubling symptoms. An explanation of the popularity of these treatments is that most psychiatric syndromes tend to remit and exacerbate spontaneously, making claims of therapeutic efficacy difficult to assess. Also, it is probable that by serendipity many treatments applied broadly enough will help a few individuals with relatively rare disorders. Lastly, it is likely that some Orthomolecular treatment regimens are therapeutic as claimed. These factors can only be elaborated when appropriate clinical trials are performed (Hoffer, 1973).

In subsequent communication (partly included below), Dr. Watson raised several objections to our study. First, he states that his Psychochemical Profile is only a truncated version of the research test. Yet it is this version which has been published, together with the specific scoring criteria and treatment regimens which we cited above. Using these criteria, the Profile classified no patients as either Type I or II, but trends were evident in the opposite-than-hypothesized direction.

Watson's second objection is that we used pH only to classify patients, when CO₂, lipid, and glucose-tolerance determinations should also be employed. We selected pH since Watson states that it is the most important single classificatory test. Beyond this, Watson states in correspondence with us that "no single test, nor (single) combination of tests will discriminate all (psychochemical types) directly . . . the final check on the validity of the classification of the patient lies in his or her clinical response to treatment." From this, it is clear that Watson's objection to our use of pH only may have been

raised even if we had included the other tests mentioned above. We conclude that the published Psychochemical Profile is not valid as a screening instrument for identifying patients with abnormal metabolic states reflected by altered venous plasma pH values.

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Watson's Reply

George Watson, Ph.D.1

The psychochemical food quiz given in my book, *Nutrition and Your Mind -The Psychochemical Response* (pages 76 - 82), is a greatly shortened version of the test we used as an heuristic aid in the research. This research test contained 230 items, split for cross-validation. I specifically stated that the "psychochemical and personality quizzes included earlier should be understood as being illustrative and suggestive rather than diagnostic" (p. 147).

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In view of this explicit admonition, I am not surprised that Braff and Callaway's work using the shortened psycho-chemical quiz received no support from their study.

The differences in incidence of extreme variations in pH between our studies and Braff and Callaway's reflect, I believe, the differences between the Langley Porter inpatient group and the outpatient group with which we worked, which they mention in their report.

Dr. Unabelle Boggs Blackwood, who undertook a modified replicative study based on our research using an outpatient population apparently similar to ours, found that in the experimental group (N-28) 14 were slow oxidizers, seven were fast oxidizers, and seven were either normal or suboxidizers.*

Blackwood employed the HOD, EWI, and Green's Dysperception tests in evaluation of the S's improvements. The significance levels for improvement on these tests were, respectively, 0.001 (HOD), 0.01 (EWI), and 0.05 (Green's test).

Her general conclusion was: "When time and care are taken to individualize treatment, practically all patients can be expected to improve if no mistake is made in determining psychochemical type."

* BLACKWOOD, U. B.: "Can Nutrients Restore Mental Health?" In press, Miller Symposium. Results quoted by permission of the author. See also J. Orthomolecular Psychiatry #4, 132-141, 1975.