

STUDIES IN RESPIRATION AND PERSONALITY

4. Suggestions concerning the interpretation of respiratory test scores and an elaboration of problems for further research

By
BJØRN CHRISTIANSEN

OSLO
INSTITUTE FOR SOCIAL RESEARCH
1966

Preface

The present monograph is the fourth one in a series called Studies in Respiration and Personality. It is a continuation of the earlier reports in this series. Its major part deals with the problem of what is being measured by the respiratory modulation test described in the just preceding report. Several hypotheses are formulated and tested in a tentative fashion. In the discussion of the results some problems for further research are pointed out, and in a concluding chapter, a few basic theoretical issues pertaining to the present as well as to our earlier studies are elaborated and discussed.

I would like once more to express my deep appreciation for the generous help and support I have received from Dr. Gardner Murphy and Mr. Charles Snyder in my respiration-and-personality studies. The writing up of the present report has been done at the Institute for Social Research, in Oslo. It has been made possible by a grant from the Norwegian Research Council for Science and the Humanities.

Oslo, January 1966

B. C.

CONTENT

HYPOTHESES SEARCHING AND ELABORATION	1
EMPIRICAL TESTING OF SOME TENTATIVE HYPOTHESES	7
Differences with respect to sex	8
Differences with respect to age	8
Differences with respect to education	10
Differences with respect to psychiatric diagnoses	12
Differences with respect to mode of field approach	14
A brief summing up	15
SUGGESTIONS CONCERNING FURTHER RESEARCH	17
The difference between cognitive and non-cognitive body concepts	17
The ability to control not-to-control	20
Problems concerning the measurement of flexibility	25
A brief summing up	26
GENERAL THEORETICAL CONSIDERATIONS	28
Fisher and Cleveland's model	28
Bloch's model	30
Rommetveit's model	32
Types of pathology and health	33
Reich's model	35
Further remarks concerning Reich's model	39
Somatic aspects of an ego armoring	43
Concluding comments on healthy respiration	47
REFERENCES	53

HYPOTHESES SEARCHING AND ELABORATION

In an earlier monograph (1965c) we described a preliminary version of a respiratory modulation test. In an empirical investigation we found the test to discriminate significantly between mental patients and normal subjects. In presenting our findings we asked whether the scores emerging from the test were related to anyone specific psychological variable. In the present chapter we want to discuss this question a bit further and launch some tentative suggestions concerning the interpretation of the test scores.

Our respiratory test can be conceived of as an instrument measuring an individual's ability to control and to modify his respiratory movements. The ability in question has a motoric and a sensory aspect. In the present context we want to emphasize the sensory aspect in particular. That is to say, we believe a person's test performance to be closely associated with his muscular sense, i.e., with the sensory 'feed back' he obtains from his respiratory muscles. Under otherwise equal conditions, we expect a person to do the better on the test the more differentiated his body awareness, and particularly, the more differentiated his awareness of his respiratory muscles.

A number of empirical studies have attempted to throw light on the psychological features characterizing individuals showing differentiated and undifferentiated body awareness, and body sensations stemming from exterior and interior body layers respectively. We may assume the performance level on the respiratory test to be associated with the same features. In any case, we are here presented with studies which may provide hypotheses for our own inquiries.

In several studies Fisher and Cleveland (1958) have demonstrated that measures of boundary definiteness derived from Rorschach responses are predictive of self-steering behavior, of the need to set and to attain one's own goals. Further more, in an investigation by Fisher and Fisher (1964) it is shown that perceptual boundary definiteness in terms of inkblot responses, is linked to body experiences, namely to the extent to which an individual is relatively more aware of sensations from his body exterior (viz., skin and muscle) than from his body interior (viz., heart and stomach). In a recent study, Fisher (1965) has demonstrated that subjects with a dominance of body exterior sensations are more likely to be characterized by an autonomous, self-assertive orientation. He accounts for his finding by the fact that the skin and

muscle are body areas particularly involved in actively contacting and responding volitionally to the world. The more an individual is oriented toward volitional, self-directive behavior, the more is he also likely to be aware of these areas since they represent the structural basis so to speak, for his dominant orientation toward life.

Granted that the awareness of exterior and interior body layers to some extent are mutually exclusive, we may suppose high scorers on our respiratory test to be particularly aware of their exterior body layers, and consequently, to be more autonomous and self-assertive than the low scorers on the test. We will consider this a reasonable hypothesis worth empirical testing.

As mentioned, a superior performance on the respiratory test not only implies muscular awareness, but a rather differentiated awareness of various respiratory muscles. We may assume the degree of differentiation being present in this area to be related to psychological differentiation in a more general sense.

The term psychological differentiation has been introduced by Witkin et al. (1962) in an attempt to account for the fact that different areas of psychic functioning seem to be closely interwoven. It is a cognitive dimension cutting across the perceptual and intellectual sphere of behavior, but it has also been demonstrated to have repercussions on the kinds of defenses being used, on the sense of separate identity being present, and on the nature of the body concept characterizing the individual. A person with a high level of differentiation is described as field independent in perception, he is able to locate figures in a complex design and to separate figures from their embedding context, he is analytic in his cognitive functioning, he has a sense of separate identity with respect to his own self, he tends to make use of specialized as compared to global defenses, and his body concept is characterized by definite limits and boundaries. In short, a person is considered the more differentiated the more he perceives his world as articulated and structured and its parts as discrete, the more he has a feeling of himself as an individual distinct from others, the more he has internalized, developed standards to guide his view of the world and of himself, and finally, the more he has a definite sense of the boundaries of his own body and of the interrelations among its parts.

Witkin et al. refer to a couple of studies linking field-dependence to body boundary sensitivity quite literally. In one of these studies field-independent subjects were found to show finer 2-point discriminations in terms of stimuli on the surface of the body than field-

dependent subjects. Field independent subjects were also found to show more accurate identification of letters written with a dull rod on the forehead and on the dorsum of the hand. In short, field independent subjects seem to be better able to experience separate stimuli on the surface of the body as discrete, and to apprehend the relation among these stimuli.

Witkin draws a distinction between an articulated experience of the body and alertness and sensitivity to body stimulation of a gross sort. A person may very well be alert and sensitive to body stimulation while at the same time experiencing his body as a vague 'mass'. For instance, a person with an unarticulated body concept may be just as sensitive and correct in experiencing with his eyes closed, his body as upright or tipped over, as a person with an articulated body concept. In other words, psychological differentiation is considered related to an articulated body experience in particular.

We may ask, is our respiratory test scores related to psychological differentiation as this concept is defined by Witkin et al.? We may hypothesize this to be true on the ground that respiratory control implies something more than alertness to body stimulation. It does also imply an articulated conception and experience of various respiratory muscles.

If the 'outside' is experienced as articulated the 'inside' tends to be so experienced as well, is one of the main points in Witkin's theoretical position. One may ask whether it is possible to change a person's 'outside' view by changing his experiences of the 'inside'? One may even wonder whether this causal sequence is easier attainable than the complementary one working from the opposite direction, i.e., from the 'outside' to the 'inside'.

Another important point emphasized by Witkin et al. is that 'a more articulated or less articulated body concept carries no necessary implication about effectiveness of adjustment'. The effectiveness of adjustment is considered mainly due to impaired integration. While differentiation refers to the complexity of structure of a psychological system, integration refers to the form of the functional relations among parts of the system and between the system and its surroundings. A psychic repression may be considered as a break in the integration of a system, and the earlier the repression takes place, the greater the consequences in blocking later developments in the direction of finer

differentiation. But a regression may probably also, granted that it does not imply basic personality layers, serve as a source for further differentiation although the underlying integration will always be affected. Although Witkin admits that a poorly developed differentiation may sometimes represent an important source for psychopathology, he seems to maintain that in principle, an unimpaired integration can occur at all levels of differentiation.

In some earlier studies on perception-personality relationships, he and his coworkers (1954) conclude:

"Among 38 hospitalized men, we found a marked preponderance of extremely field-dependent and extremely independent or analytical perceptual performances, and a small proportion of cases in the intermediate group; among 39 hospitalized women, we found a concentration of cases in the field-dependent category. The distributions of scores of both the male and female hospital groups were significantly different from those of the normal men and women." (p. 342)

We may interpret this as implying that in a mixed sex hospital population we would expect to find a preponderance of cases in the undifferentiated category, but that some patients do also show a high degree of differentiation, and that the variable in question does not discriminate sharply between patients and normals. It should be added that in comparing groups we may still find statistically significant differences between mean scores with the patients obtaining the lower ones.

One of the most remarkable findings of Witkin's studies is the demonstration of significant sex differences in mode of field approach. By and large men are relatively more differentiated than women. The sex differences that have been observed, Witkin notes, are clear-cut and pervasive, although they are relatively slight compared to the range of individual differences within each sex group. However, significant relations between mode of field approach and measures of masculinity-femininity have been found even within each sex group.

As regards age variations in mode of field approach, Witkin et al. (1962) have made some interesting observations:

"Children tend to be relatively field dependent early in their perceptual development and to become more field independent as they grow older. (Field independence) tends to improve, on the whole, until about the age of 17. Thereafter, there is a tendency toward increased field dependence, particularly in the case of women, although the increase is relatively slight compared to the earlier decline." (p. 374)

Another problem area that has been extensively studied is the relationship between measures of field dependence and standard intelligence tests. In several investigations it has been found that field independence is positively related to intelligence test scores but that this relationship is 'carried' largely by those portions of the tests which require analytical functioning, i.e., particularly some of the subtests on the performance side. Verbal skills, by and large have been found to show little or no relation to mode of field approach or other characteristics of differentiation. Although the question has not been dealt with by Witkins et al., the positive relation found between intelligence test scores and field approach makes it likely that a similar positive relationship is present between differentiation and different levels of educational achievements. Some experimental findings by Crutchfield (1955), strongly supports this hypothesis.

Discussing the relevance of the differentiation concept for psychopathological inferences, Witkin (1965) writes:

"Although cognitive style, and associated characteristics of more developed and less developed differentiation, relate to particular symptoms and symptom pictures, they do not relate to major nosological categories, as neuroses and schizophrenia. Among hospitalized psychiatric patients we found cases diagnosed 'schizophrenic' scattered throughout the distribution of measures of perceptual field dependence." (p. 21)

As mentioned earlier, a central point in Witkin's conceptions is that level of differentiation is not directly related to pathology. What he does maintain however, is that pathology takes different forms among more and less differentiated persons, and that the form of pathology characterizing a given mental patient will be associated with his particular level of differentiation.

The following paragraphs summarize his main viewpoints in this area.

When personality disturbances occur among persons with limited differentiation the manifest picture is usually severe identity problems, with little struggle for maintenance of identity; symptoms often considered suggestive of deep-seated problems of dependence; inadequately developed controls resulting in chaotic functioning; and passivity and helplessness. Examples of clinical pictures typically associated with limited differentiation are alcoholism, obesity, hysterical and inadequate personalities, catatonics, patients who somatize their complaints and deny any psychological problems, and patients whose primary symptoms are affective discharges rather than defensive symptom organizations.

The type of personality disturbance typically found in persons with high differentiation, or more correctly - when such persons break down - is continuous struggle for the maintenance of identity, however unrealistic the attempt; tendencies to show overcontrol, overideation, isolation, and overintellectualization; and tendencies to show delusions (rather than hallucinations), expansive and euphoric ideas of grandeur (rather than inferiority) and outward direction of aggression (rather than passivity and diffuse anxiety). Clinical groups associated with high differentiation are obsessive-compulsive characters, paranoids, neurotics with organized symptom patterns, and ambulatory schizophrenics with a well-developed defensive structure.

Generally speaking, while the differentiated patient shows a certain autonomy and self assertiveness in symptomatology, these features are more or less lacking in the undifferentiated patient. By emphasizing these features we are in fact suggesting connections between Witkin's conceptions and the theoretical position of Fisher, earlier referred to.

By way of summing up we may conclude that Witkin et al. have put forth a number of hypotheses of great relevance for our own respiratory data. Granted that our respiratory test scores are related to psychological differentiation we would expect to find 1) a preponderance of mental patients scoring relatively low on the test, but with a certain overlap between the score distributions of patients and normals, 2) a preponderance of females scoring relatively low on the test, but with a large overlap between males and females, 3) a tendency for younger adults to obtain higher scores than older ones; 4) a positive relationship between respiratory test scores and the subjects' educational achievements; and finally, 5) a lack of relationship between test scores and conventional nosological categories, but a positive one between test scores and various symptom pictures.

In the next chapter we are going to examine these hypotheses by consulting of our empirical data.

EMPIRICAL TESTING OF SOME TENTATIVE HYPOTHESES

In an earlier monograph, we cited Lowen's (1958) proposition that "the depth and the strength of the ego depend upon the degree of conscious control and co-ordination of voluntary musculature", and we suggested that if the proposition was correct our respiratory test may provide information about ego strength. The trouble is however, that ego strength is a very vague concept which is very difficult to relate to any particular psychological observations.

By hypothetically linking the test scores to body boundary definiteness, body image articulation, and to psychological differentiation, we are in a much better position; in a position making it possible for us to do a number of more specific inquiries.

In order to find out whether respiratory test scores can be linked to these concepts we are going to examine the correlations being present between the test scores and various demographic variables, variables which have previously been found to be positively associated with the concepts in question. Although this is an indirect approach to the problem of demonstrating significant connections, it is an approach which may still offer significant indications.

It should be recalled that our starting point was the statistically significant difference found between mental patients and normal subjects in terms of respiratory test scores. Both here and in later sections, by test scores we are referring to the composite scale scores on the respiratory test.

The score distributions were the following ones:

	Test Scores							
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15
Patients	-	1	2	8	5	4	3	1
Normals	2	10	8	2	1	1	-	-

It should be noted that the lower the scores on the test, the better is the subject's test performance.

Looking at the table one discovers a relatively large overlap. Only 12,5% of the patients fall outside the score distribution of the normals, and only 6% of the normals fall below the lowest score obtained by a patient subject.

In spite of the great overlap, the difference between the means of the two samples does attain a fairly high statistical significance. On the other hand, the overlap is obviously too great to allow us to interpret the scores as a simple index of mental illness. It was just this large overlap that initiated our search for a psychological interpretation of the test scores.

Differences with respect to sex

As pointed out in the previous monograph, our data show a statistically significant sex difference. The score distributions were the following ones:

Test Scores

	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15
Males	2	10	2	5	4	0	1	-
Females	-	1	8	5	2	5	2	1

In spite of the significant difference between the means, there is a considerable overlap between the two distributions.

The great overlap, and particularly the fact that we find males generally to obtain lower scores (to perform better on the test) than females, lend support to the hypothesis that we are dealing with a variable associated with psychological differentiation.

Differences with respect to age

In our total sample of subjects ($N = 48$) we found a positive correlation, $r = .26$, between test scores and age. The correlation is not very high, but reaches - accepting a one-tail criterion - the 5% level of significance. Consequently, there is a clear tendency at least for older subjects to obtain higher scores (to show an inferior test performance) than younger ones.

In making up our research design we had planned to control for the age factor. However, our controlling endeavours did not go any further than to make sure that the mean age of our normal and patient subjects did not differ significantly. Our 24 patients obtained an average age of 36.4 years as compared to an average age of 34.8 years among our normal subjects.

Computing the correlations between test scores and age among patients and normals separately, we find a rather negligible difference, the correlation coefficients being .33 and .20, respectively. Nevertheless, it should be noted that the age factor in the patient group tends to be a little more discriminating.

Looking further into the age distributions of our different groups we discover a striking difference between males and females. While the female group obtains an average age of 39.2 years, the male group turns out to be much younger and to show an average age of 32.1 years only. The difference is significant at the 3% level.

This latter finding raises the question as to what extent the statistically significant sex difference reported earlier is really a sex difference at all and not only an artifact of the age difference being present between the sexes.

In order to examine this problem we have divided our subjects into three age groups of approximately the same size, and studied the sex difference in each group.

	Age Group					
	(Below 29)		(29-39)		(Above 39)	
	<u>N</u>	<u>M</u>	<u>N</u>	<u>M</u>	<u>N</u>	<u>M</u>
Males	10	5.90	9	4.11	5	3.80
Females	6	4.83	6	8.50	12	8.42
Difference between means	-	1.07	-	4.39	-	4.62
Level of significance	-	N.S.	-	.03	-	.03

We find a significant sex difference in two of the three age groups, and in both instances the females obtain higher mean scores than the males, a finding which lends great support to our earlier conclusion.

The fact that we find the sex difference to be greater with higher age levels to some extent fits in with Witkin's statement that after the age of 17 "there is a tendency toward increased field dependence particularly in the case of women". On the other hand, in our

youngest age group we find a tendency for males to obtain higher scores than females.

The lack of consistency of our findings indicate that sex is not an extremely potent factor in determining the test scores. A part of the influence previously ascribed to sex, might very well be due to age differences.

Looking a bit further at the above table we notice that the mean scores in the various male groups show a falling tendency with increasing age. This is remarkable since we would have expected on the basis of the previous findings to discover exactly the opposite trend. Computing the correlation coefficients for males and females separately, we find the test scores to be positively associated with age in the female group only ($r = .36$). Among males we find a slight negative correlation ($r = -.12$).

This finding may be interpreted as indicating that some other factors are present overruling the potential effect of age in the male group.

In order to get a clearer picture of the influence of age we have computed the correlation between test scores and age in all our four subsamples. We find the correlations to vary as follows:

Among normal females	+ .48
Among male patients	+ .26
Among female patients	+ .10
Among normal males	- .67

The difference found between normal males and females is highly significant ($p < .01$). Particularly interesting is the high negative correlation found among normal males. This is the only subsample showing a negative correlation. Consequently, it is particularly in the normal male group we would have to look for possible factors counteracting the seemingly negative influence of increasing age.

Differences with respect to education

Our information about the subjects' educational background is extremely meager and is restricted to the normals only. The only data we have on this variable is whether the individual subject has a doctoral title or not. Eight of our 24 normal subjects have a doctoral degree (either a MD or a PhD degree). We will consider these eight subjects as belonging to an upper extreme group in terms of educational achievements.

Dichotomizing our normal group according to this criterion, we find a significant difference in terms of mean scores. In the high educational group we find an average respiratory test score of 2.0, as compared to an average score of 5.1 in the low group. The Mann-Whitney U-test shows the two groups to be different at the .01 level of significance.

Our empirical data lend support to the hypothesis that educational level is positively associated with respiratory test scores, with high education being linked to superior test performance.

Again, however, we are faced with a relationship that might possible be a spurious one. Before concluding that education do play a significant role we would have to examine this variable in situations where sex and age are kept under control. The importance of controlling for the sex factor is particularly relevant since seven of the eight doctors included in the high education group are males, and since we have already presented findings indicating that males generally do perform better on the respiratory test than females.

Concentrating on normal males exclusively, we find the doctors to obtain a mean test score of 2.0, and the non-doctors to obtain a mean score of 3.2. The difference between the two samples - again making use of the Mann-Whitney U-test - is statistically significant at .03 level. Consequently, our data indicate that education do play a significant role even when sex is kept constant.

Having demonstrated the probable influence of education among normal males, the next problem is whether this particular influence may explain the unique negative association found in this very group between age and respiratory scores. A precondition for accepting the explanation would be that age and education can be shown to be highly correlated in this particular group, and that the influence of education can be demonstrated even when age is kept approximately constant.

Dividing the normal males into the three age groups previously employed, we find the following distributions of male doctors and non-doctors.

	Age Group		
	<u>Below 29</u>	<u>29-39</u>	<u>Above 39</u>
Doctors	-	4	3
Non-doctors	2	3	-

Compared to an average age of 29.6 years among the non-doctors, the doctors obtain an average age of 37.6 years. The difference between the two samples is significant at the .02 level.

The positive association found between age and education lends support to the above explanation.

Looking at the table a little further we find that 7 normal males fall in the age group between 29 and 39, and that 4 of the 7 subjects have a doctoral degree. The four subjects obtain an average respiratory test score of 2.0, while the three remaining subjects obtain an average score of 2.67. Although the difference between the two groups does not reach statistical significance ($p = .20$), it goes in the direction expected.

It should also be mentioned in passing that the only female subject with a doctoral degree obtains a very low score on the test and that this subject is found in the youngest age group.

We are fully aware of the shortcomings of the above analysis. The small number of subjects involved poses severe limitations on the statistical analysis, particularly when it comes to parcelling out variables for the purpose of control. However, granted these limitations, we still want to conclude that our empirical material supports the suggestion that the negative relationship found between age and test scores among normal males is due to the positive association existing between age and educational level in this group. Implicit in this formulation is, of course, our earlier finding that educational level seems to be positively associated with a superior test performance.

Differences with respect to psychiatric diagnoses

In order to find out whether respiratory test scores are linked to psychiatric diagnostic categories we have gone through the diagnostic labels being ascribed to our patient subjects. In the male group we find that 5 out of the 12 patients have been diagnosed as schizophrenic reaction, and in the female group, that 5 out of 12 patients have been diagnosed as depressive reaction.

We find a tendency for the males with schizophrenic reaction to obtain higher scores than the other male patients, the means being 8.0 and 6.43, respectively. However, the difference in question does not reach statistical significance ($p = .17$).

Turning to the female sample, we find the patients with a depressive reaction to obtain a higher mean score than the remaining ones (9.80 versus 9.28). Neither does this difference show any statistical significance ($p = .31$). The tendency noted for male schizophrenics to obtain higher scores than the rest of the males is paralleled by a similar tendency in the female group. Among the female patients, two are diagnosed as schizophrenic reaction, and the mean score of these two is 11.5 as compared to a mean score of 9.1 for the remaining ones.

In addition to being ascribed a certain reaction type, all the patients had also been given a personality type diagnosis. Of the 24 patients considered, the following types were represented: infantile personality, narcissistic personality, schizoid personality, passive aggressive personality, and hysterical personality.

Do patients with various personality types obtain significantly different test scores? The next table shows the means of the patients categorized in terms of the various types.

<u>Type</u>	<u>N</u>	<u>M</u>
Compulsive	6	9.17
Schizoid	4	9.00
Narcissistic	4	8.50
Passive-aggressive	2	8.00
Infantile	7	7.43
Hysterical	1	6.00

The highest means are found among schizoid and compulsive personalities, and the lowest among infantile and hysterical types. This is not exactly what we would have expected, but we have to add that the overlap between the groups are very striking. We find for instance, that three of the compulsive subjects obtain lower scores than four of the infantile subjects, and that three of the infantile subjects obtain higher scores than two of the schizoids.

To test the difference between the means, we have made use of a simple analysis of variance.

Variance Table for Data on Personality Types

Source	Sum of Squares	df.	Variance Estimate
Between	17	5	3.40
Within	188	18	10.44
Total	205	23	-

The F-ratio is 0.326, which is completely non-significant. Consequently, our results do not support the idea that the respiratory test discriminates between psychiatric formulations concerning the patients' personality types.

Differences with respect to mode of field approach

Subsequent to our unsuccessful attempt to relate respiratory test scores to psychiatric reaction type and personality type categories - we excerpted a short summary of each patient's personality structure from the psychiatric records - particularly from the psychological test reports. On the basis of these summaries (and without knowing the individual patient's respiratory test score) we classified the patients into two groups, into a high and a low group with respect to how we supposed them to stand on psychological differentiation, emphasizing particularly their global vs. analytic orientation and their probable field dependence - independence. That is to say, after reading through an excerpt of the psychological test conclusions of each patient, we made a judgment of his probable position on the differentiation dimension. In making this judgment we did not make use of any absolute standards. Our judgment took the form of a rather impressionistic classification. In order to make the relative nature of our judgments clear and explicit, we decided to force an equal number of patients into each of the two groups. Consequently, in judging the individual patient we were to some extent influenced by our judgment of the other ones. Finally, in making the judgments we tried consistently to disregard the patient's sex.

Of the 12 patients being classified as the most differentiated ones, eight were males and four females, and among the 12 least differentiated, eight were females and four males.

The mean respiratory test score obtained by the two groups were 9.92 and 6.58 respectively, with the high differentiated group obtaining

the lowest mean. The difference between the means gives $t = 3.18$, which is statistically significant at 1% level.

This latter finding lends support of a more direct nature to the hypothesis that the respiratory test scores are associated with psychological differentiation. The better the performance on the test, by and large the more differentiated we have reason to assume a patient to be.

In spite of our attempt to disregard the sex of the individual patient, the simple fact that we judged many more females than males to be low on differentiation imposes the important question whether we have been influenced in our judgments by our prior knowledge that females generally tend to obtain higher respiratory scores.

In order to provide a check on this possible source of error the following problem have been studied: Does the same relationship emerge even when sex is kept constant?

The Group Means of Males and Females Separately

	<u>Estimated Level of Differentiation</u>	
	<u>High</u>	<u>Low</u>
Males	6.75	7.75
Females	6.25	11.00

For both sexes we find that the patients classified as the least differentiated obtain the highest mean scores. Looking into the score distributions in each of the two sex groups, we find - by making use of the Mann-Whitney's U-test, that the association between estimated differentiation and test scores in the male and female groups reach the .20 and the .02 level of significance respectively.

Although we cannot say that the above results prove that our respiratory test scores are measuring psychological differentiation, we think they are strongly suggestive in this respect.

A brief summing up

Summing up the present chapter we want to emphasize that we have found some empirical support for all the hypotheses deducted from the proposition that respiratory test scores do provide a measure of psychological differentiation as this concept is defined and employed by Witkin et al. We have found the scores to be related in a predictable way to mental illness, sex, age, education, and to personality features estimated from clinical reports.

On the other hand, we don't want to consider the problem as settled in any final way. At a later occasion we would very much like to examine the relationships involved in a more direct manner, by making use of some of the tests specially devised by Witkin et al. for tapping the differentiation dimension. At the present time, we don't want to go any further than to present our data as suggestive hints and tentative findings.

SUGGESTIONS CONCERNING FURTHER RESEARCH

As previously noted, in several investigations field-independence, measured through perceptual laboratory tests, has been shown to be positively related to those subtests on standard intelligence scales which are focussed on analytical functioning. For instance, Witkin et al. report that 'analytical IQ's" on the WAIS (based upon the block design, picture completion and object assembly subtests) are highly related to field independence, in fact, significantly higher related than the conventional Performance IQ. In contrast to these measures, the verbal-comprehension IQ's (based upon the vocabulary, information and comprehension subtests) have been found to be rather unrelated, even more unrelated than the conventional Verbal IQ. The single subtest being considered to be the most related is the block design test. At one place Witkin even states that this subtest is "a good test of field dependence". This being true we would expect to find a high positive correlation between performance on the respiratory test and on the block design subtest (and of course, with the subject's analytical IQ as well). Since all our patients subjects had been administered the WAIS we had planned to compute and examine these correlations. However, so far we have not been able to get hold of the intelligence test records. By studying the intelligence test scores of the patients we had also planned to get an independent check on our impressionistic rating of their degree of field dependence - independence. We hope that this study can be done in the near future. In any case, it would give a possible check of our leading hypothesis discussed in the previous chapter.

The difference between cognitive and non-cognitive body concepts

It may sound a little surprising that in the first chapter we hypothesized a close connection to exist between respiratory modify-ability (as measured by the respiratory test) and psychological differentiation, since an integral part of this latter concept as far as body properties are concerned is heavily related to the cognitive sphere. This point is made quite clear in Witkin's writing. After having ascribed a definite sense of the boundaries of the body and the interrelations among its parts, as a characteristic of psychological differentiation, he explicitly states that what he is concerned with is the

cognitive aspect of the body concept, and particularly, with the global-articulation dimension as it applies to this aspect.

In order to examine the body properties in question he makes use of figure drawing material (the Machover DAP test) and a 5 point sophistication-of-body-concept rating scale - emphasizing such features as form level, level of detailing and sex specification and differentiation. We will have more to say about this technique.

When we started out by stating that our leading hypothesis may sound surprising, the reason was that in constructing the respiratory test we made several statements to the effect that we were aiming at an instrument tapping a dimension going beyond the body concept cognitively considered. What we were aiming at was a person's immediate, non-cognitive bodily awareness.

We still believe the respiratory test to tap this level. But we also believe that the figure drawing technique employed by Witkin et al. to some extent is tapping the same level. In an earlier work (1963) we have formulated some hypotheses concerning this issue. We mentioned at that time that a number of principles of interpretation which have emerged in the area of figure drawing, correspond fairly closely to suggestions concerning postural interpretations stemming from observations gathered in very different settings. We suggested that an individual in drawing a person will tend to project tensions and conflicts manifested in his own postural system; in short, that difficulties and distortions in the drawing of the human body frequently will be paralleled by a disturbed proprioceptive feedback and awareness of the body features in question. But we also made a specific reservation concerning this viewpoint by emphasizing that in the same way as situationally induced postures (or consciously assumed positions) may make depth-interpretations difficult or impossible, so may the same be true as regards situational (and conscious) factors in the realm of figure drawing. For instance, it is reasonable to believe that a person with a physical handicap (e.g. with an amputated arm or a paralyzed leg due to poliomyelites) in drawing a person will avoid projecting his deformity (cf. the study by Silverstein and Robinson 1956). This avoidance is rather easy because no unconscious dynamic tension is involved. When talking about distortions in figure drawings, we would assume an active blocking of awareness to be far more significant than a physically determined lack of awareness.

Turning back to our starting remarks, we want to question Witkin's

assumption that he is working on the cognitive level exclusively. In one sense this is an unfair remark since Witkin's main contribution has been to demonstrate the close interconnection existing in the human personality between cognitive, intellectual, affective and other aspects, but we are here referring to his body concept considerations exclusively.

To sum up, we believe that the respiratory test is tapping what may be called a non-cognitive awareness of the body parts involved in respiratory control. We believe the experience of these parts to be positively related to a differentiated awareness of body exterior layers generally. Furthermore, we believe that this type of direct body experience will have repercussions on a person's figure drawing productions, although we don't think this influence will be a constant one, but will vary with - and under certain circumstances even be overruled by - factors of a cognitive nature. What we believe is that the respiratory test scores will be positively related to figure drawing productions in general, but that this relationship under specific conditions may break down. Finally, we believe, and this is a consequence what have just been said - that the figure drawing technique is relatively unsuited to 'grasp' an individual's body concept cognitively considered. After having said this, we would like to add that we think it is quite probable that a person's body concept ordinarily will be heavily influenced by his body awareness, and that we don't in any way object to Witkin's proposition that a close connection exist between an articulated experience of the 'inside' and the 'outside'.

Suma summarum, we believe that our respiratory test will be related to psychological differentiation not in spite of but rather because of its non-cognitive orientation. In fact, we think it will be significantly more related to this concept than figure drawings produced in a self-conscious, ego-involved test situation. The test calls for a differentiated body concept, but also something else, namely the direct awareness of underlying (differentiated) body structures. A sort of interconnection has to be present between the cognitive and the somatic level, and it is just this interconnection we think of as mediated through noncognitive experiences. On the other hand, referring back to one of our earlier discussions, the respiratory test doesn't require anything like a complete proprioceptive awareness since it is directed towards respiratory movements, and movements, by definition, imply an augmentation of proprioceptive stimuli far above the level found in a passive, resting position.

The ability to control not-to-control

The fact that the respiratory test is directed towards movements being actively innervated and controlled, imposes certain limitations on its psychological applicability. It may tell us something about a person's ability to control his body exterior, and as noted, we believe this to be related to the awareness dimension, but it does not tell us anything about his ability not to control, or more correctly, about his ability to control not-to-control, which in our opinion, is still more demanding in terms of bodily awareness.

We are going to explain this viewpoint a little further.

By focussing upon performance the respiratory test misses the whole question of whether a person is able to function on different levels of control, and this question may be considered essential and crucial for evaluating a person's level of integration. The test is geared toward differentiation at the expense of integration, so to speak.

By integration we refer not only to a harmonious interplay between parts of a system, but also to a condition in which different parts may intermerge and depart without destroying the unity of the system as a whole. Consequently, a high level of differentiation does not guarantee a comparable high level of integration. The differentiation may go together with a rigid structure not allowing any de-differentiation to take place even in situations where this is called for. Conversely, we may be confronted with an overflexible structure facilitating changes in differentiation in appropriate and inappropriate settings alike. By the term integration we refer to an optimal level of flexibility in terms of differentiation level. This is the reason for our preference for the expression 'the ability to control not-to-control'.

The present discussion brings us back to our earlier considerations concerning the relationship between psychopathology and psychological differentiation. We mentioned at that time that according to Witkin et al., psychopathology is mainly related to the level of integration and that this variable to a large extent is seen as independent of the differentiation dimension.

Witkin is very much aware that his differentiation concept leaves out the flexibility variable. At one place (1965), he states:

"Our clinical observations strongly suggest that some persons who are field independent and show other characteristics of developed differentiation function consistently at a highly differentiated level, whereas others vary more according to

circumstances and inner state. The first kind of subject shows 'mobility'. The perceptual tasks we devised to assess cognitive style, by design, press the subject to perform analytically if he possibly can. They therefore do not permit us to distinguish between these two kinds of subjects." (p. 35)

He maintains that he believes the dimension of 'fixity - mobility' to relate to differentiation in a very complex way, and that it may actually cut across the latter variable. Discussing the problem of personality characteristics associated with potential for change in psychotherapy, he ventures the prediction that the patients being the best candidates for change are those who are relatively differentiated and at the same time are relatively high on the mobility dimension. ¹⁾ As the least likely candidates for change, he considers those who are extremely undifferentiated and who because of that are severely limited in their 'mobility' potential.

He goes on to say that it is possible that patients who are intermediate in the range of measures of differentiation in general are more amenable to change than highly differentiated patients. He emphasizes that this is a suggestion that remains to be checked, but that it is based on the clinical impression that the latter group is likely to include relatively more patients with limited 'mobility'. At this point it is interesting to recall Witkin's own earlier empirical findings (1954) that hospitalized men showed a marked preponderance of extremely field-dependent and extremely field-independent performances with a relatively small proportion of cases falling in the intermediate category.

Having related the mobility or flexibility dimension to psychological integration, we may interpret Witkin as saying that a person is the more amenable to change in psychotherapy, the less need he has for such therapy. This follows from Witkin's own proposition that psychopathology is causally related to a failure or impairment of integration. Or we may reformulate the statement as follows: The higher a person's

1) It should be noted that Witkin (1965) is rather pessimistic as regards the effect of psychotherapy in changing a person's level of differentiation. He states: "The nature of differentiation as a structural aspect of personality, and the stability of relative level of differentiation over time and with experimental intervention, leads us to think that the characteristics of differentiation may not change with psychotherapy". In view of our earlier discussion we would predict that a dynamically oriented physiotherapy may possibly produce significant changes.

position on the mobility-fixity dimension, the higher is his mental health potential.

As mentioned, we feel very much in favor of relating mobility to psychological integration although we don't consider the relationship to be a linear one in the sense that the higher the flexibility (or mobility), the higher the integration being present. By introducing the term optimal flexibility we wanted to emphasize the nonlinear nature of the relationship.

Holding on to the proposition that psychopathology is a function of a non-optimal flexibility, we still think that positive mental health is something more than an optimal flexibility. Following Jahoda's (1958) idea that positive health implies something more than lack of mental illness, we will suggest that positive health may be defined as the presence of a maximum degree of psychological differentiation combined with an optimal degree of flexibility making it possible for a person to relate to himself and to his surroundings with a high or with a low degree of differentiation when he so needs or desires. According to this definition, positive health refers to an adequate integration combined with a high degree of differentiation, - or conversely - to a high differentiation combined with a high degree of integration.

In view of Witkin's observations we would expect the two factors to be simultaneously present in relatively few instances. How to evaluate their relative contributions with respect to an overall estimate of positive health imposes problems, which, however, will probably not be too difficult to solve granted we had been able to develop measures of integration of the same objective, reliable type as those existing today with respect to the differentiation dimension.

As noted, our own interest for measures of integration is paralleled closely by Witkin's call for techniques enabling him to distinguish between subjects showing 'fixity' and 'mobility' of cognitive functioning. As a method for obtaining this type of information he suggests studying the subject's variation and degree of field dependence in a situation leaving it to the option of the subject to function at his maximum analytical capacity or not. He even mentions observations indicating that among subjects showing consistent field-independence with instructions pushing them toward an analytical attitude, there are some varying (or 'relaxing') more than others with 'free instructions'.

Translated to the respiratory realm, Witkin's suggestion mounts to studying subjects' respiratory behavior not only in a test situation

demanding their maximum involvement in terms of respiratory control, but also in a situation with no external pressure in the direction of good performance and maximum achievement. We would certainly agree that comparing the subject's behavior in the two types of situations would provide valuable information concerning their 'fixity' in terms of an achievement orientation. But we don't believe that it is exactly the fixity or mobility of an achievement orientation that is the crucial factor in evaluating the flexibility dimension. In any case, we would not be able to distinguish between a subject showing fixity because he is unable to do otherwise, and another subject showing the same thing in spite of his ability to do otherwise if he so desires. What we want to tap is just this undelying ability or capacity dimension.

Another way to approach this dimension would be to study a subject's spontaneous behavior outside the realm of any specific test situation and examine his behavioral variations per se. The difficulty confronting us in this instance would be that we wouldn't really know whether a small variation was due to 'fixity' or to minimal situational variations, and a large variation, to an egosyntonic or to an ego-alien flexibility.

To get at the flexibility dimension in the realm of cognitive functions leads into great difficulties - even if the researcher is willing to employ an ideographic clinical approach making use of interviews and projective techniques. A main difficulty is the problem of knowing beforehand whether one will be able to obtain the information needed or not in a particular testing session.

Holding on to respiratory behavior, a possible approach is to study the subject's breathing pattern in a completely non-demanding situation where he is asked to relax and where he is kept completely uninformed about our concern with respiratory behavior altogether. Of course, the subject's breathing pattern in this situation wouldn't reveal his flexibility level directly. It would have to be interpreted, and the correctness of our inferences would stand and fall on the validity of the principles of interpretation we were making use of.

We are going to suggest that it is possible in principle at least to formulate a set of cues allowing us to draw inferences concerning the flexibility dimension from a subject's breathing pattern in a resting situation. In fact, in an earlier monograph (1965 b, p. 47) we have spelled out in detail a number of such cues under the heading of an ego-maturity scale. We even demonstrated that the scale was able to dis-

criminate significantly between mental patients and normal subjects, and that it was significantly correlated with Fisher's 'over-all body image disturbance scale' based upon graphic projection material. What is particularly important to note is that the scale appears to discriminate better between patients and normals than the respiratory test scores. It should also be noted that this in a sense confirms Witkin's suggestion that "mobility" is a better indicator of psychopathology than is the differentiation dimension.

The question may be raised: What is the rationale for interpreting respiratory movements under resting, non-demanding conditions as an expression of psychological flexibility?

The answer is quite simple. What we are looking for is the subject's ability to let his breathing go in an unrestrained and uninhibited fashion. Our cues or criteria are referring to what extent this is true or not. Behind the criteria stands a set of theoretical assumptions concerning the characteristics of unrestrained breathing.

To breathe in an unrestrained way implies that the subject is able to and willing to surrender to his own breathing movements. It implies that he is able and willing to give up his own conscious and unconscious control over his breathing, while at the same time experiencing himself as being present in or being moved by dynamic forces within himself. In short, it implies that he is able to control not-to-control.

The term control not-to-control is closely related to the psychoanalytic concept of regression in the service of the ego. At one place Freud proclaims that the ego develops from perceiving instincts to controlling them. If we look upon breathing as instinctual behavior (cf. our earlier discussion 1965 c, page 46), we may say that what is involved is a regression of the ego to a state of passively perceiving instinctual manifestations.

The ability not-to-control the breathing is strongly emphasized in autogenic training. The following description by Schultz, quoted from Braatoy (1947), may serve as an illustration:

"In autogenic training every conscious modification of the breathing is considered a disturbance, since it implies tension and arbitrariness. After the subject has gone through and have achieved competence in the earlier exercises (weight and warmth in relation to the arms, and rest in relation to the heart) he should now add the following suggestion: "The breathing is quite calm". For many subjects the temptation is great to do something intentionally with their breathing which they may have learned from one place or another. This has to be completely avoided in autogenic training. The breathing shall follow the experience of calmness

with a completely relaxed attitude. In order to cancel out any intentional and incorrect breathing, the following more extensive concentration is recommended: "It breathes with me". It means that the breathing on the basis of calmness and relaxation shall carry and absorb the trainee completely. He is to submit himself to the breathing as if swimming in smoothly, rhythmically rolling water." (p. 215)

What the instruction says is in fact that the subject shall relate himself passively to his primitive, spontaneous respiratory activity.

There are many mental patients who have an extremely limited ability to control their own breathing. Very often they may even complain about their lack of control in this respect. Telling such a person that it is a sign of flexibility to be able not-to-control he would certainly protest loudly. To repeat, flexibility implies something more than lack of control, it is the capacity to determine oneself when and where to control and not-to-control.

Problems concerning the measurement of flexibility

By encouraging the subject to relax and by eventually distracting his attention away from his own breathing, the aim is to provide a situation maximally fitted to procure unrestrained breathing. In our own experiments (1965 a), we did not start the recording until some time after the subject indicated by a signal that he really felt comfortably relaxing and at ease, and we stopped it immediately, if the subject after some time indicated that he could not any longer maintain his initial state of comfort.

It might be questioned why we didn't introduce this part of our experiment as a respiratory test and went right ahead and informed the subject that we were interested in his ability to let his breathing go freely and uncontrolled? We might even have told him that we would wait with the recordings until he himself experienced and signalled that his breathing was as unrestrained as he had the capacity to make it.

At present we tend to agree that this would have been a more adequate procedure. By not mentioning breathing (in fact, by even distracting the subject's focus of attention away from his breathing by introducing the test as a study of muscular tone generally) we were following the procedure of Clausen and other researchers who have been active in this field of inquiry. The main reason why this procedure has been recommended is the observation that many subjects become significantly more tense and restless, if, intentionally or not, their attention is

directed toward their respiratory behavior. Consequently, it is a procedure facilitating a smooth running of the data gathering process.

Most probably, the two types of procedures do not make any great difference. A person being significantly upset and tense when his attention is directed toward his breathing while knowing it is going to be, or that it is actually being, recorded, will, we have reason to believe, reveal in his breathing underlying tension also in a situation where his attention is otherwise directed. On the other hand, by making the purpose of the test known to the subject, some very few subjects might be helped, not primarily by the reduction of the ambiguity of the situation, but by directing their attention to what is called for and thereby making it possible for them to judge themselves when the recording should be started. This implies of course, that they have the capacity really to feel and to discriminate when they are breathing freely.

As pointed out earlier, to breathe freely is something that cannot be accomplished through an active investment of concentration and willpower. In fact, the higher this investment is, the less freely will the breathing probably become. By pointing out the purpose of the test we may make it easier to single out those subjects who are characterized by high differentiation of a rigid nature, since these subjects more than anybody else will tend to approach the task as a matter of achievement.

What about those subjects who are rigid and low on the differentiation dimension? In our opinion, these are the subjects who have a minimal control over their breathing pattern. It is true that making them aware of the purpose of the experiment will not increase their controlling capacity. On the other hand, it is reasonable to believe that this group will reveal their overpowering inner tension under all circumstances regardless of the type of instruction being used.

Finally, what about those subjects who are low on the differentiation dimension and still flexible and mobile in their functioning? This is a combination of attributes we don't believe to exist except among young children. In this respect, we are following Witkin's view when he talks about undifferentiated personalities as persons "whose resources are limited and who patiently cannot have great mobility".

A brief summing up

What we have attempted in the present chapter is to discuss the position of the respiratory test in a wider psychodiagnostic framework.

We have assumed that the test is measuring psychological functions closely related to Witkin's differentiation dimension. After having dealt at some length with the question of cognitive vs. noncognitive body experiences, we have pointed out limitations inherent in the test due to its active performance requirements. These limitations do not apply to the test as long as we are dealing with differentiation exclusively, but carry great weight if we want to make inferences concerning psychological flexibility or integration. In the last part of the chapter we have concentrated our attention on these latter concepts and made some suggestions concerning their measurement through respiratory recordings. We have emphasized the importance of the ability to control not-to-control and indicated that given an explicit definition of unrestrained breathing, the ability in question may possibly be submitted to systematic and objective scrutiny. We consider this to be a fascinating area for further study. Subsequently, we may start to explore in an objective manner the relationship between differentiation and integration, and successively, even the topic of positive mental health.

GENERAL THEORETICAL CONSIDERATIONS

In the preceding chapter it was suggested that psychological integration may be defined as a capacity for self-government or self-determination, and that a measure of this capacity may possibly be derived from respiratory observations, given the availability of valid information about the characteristics of unrestrained respiration. In the present chapter, we are going to discuss this problem a little further. In order to provide as broad a theoretical framework as possible for this discussion, we will start out by describing briefly some personality models of relevance for our own conceptions.

Fisher and Cleveland's model

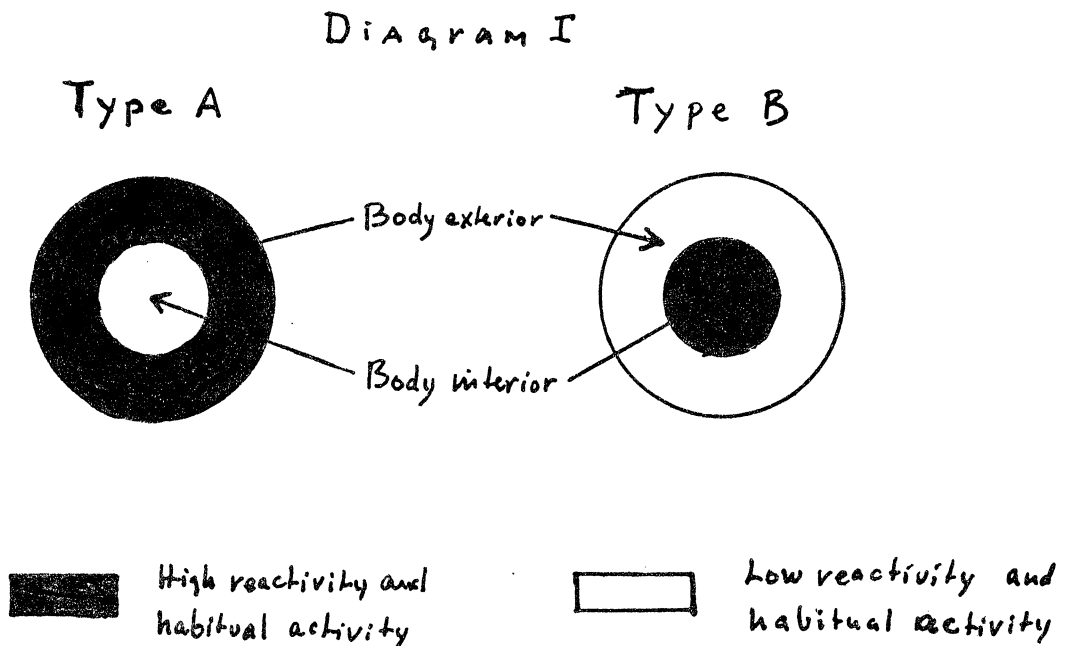
We have already referred to Fisher and Cleveland's theoretical position emphasizing the concept of body boundary definiteness and its association with autonomous, self-assertive and self-steering behavior. We have also mentioned Fisher's suggestion that body boundary definiteness is intimately related to a predominance of sensations stemming from body-exterior as compared to body-interior layers.

The next question is, of course, whether persons with relatively high and low body boundary definiteness will also tend to show differences in terms of somatic processes and responses. Actually, this seems to be the case. Comparing subjects being high and low in terms of Barrier scores, i.e., an index of body boundary definiteness derived from inkblot responses, Fisher and Cleveland found significant differences in terms of various measures of physiological reactivity.

It was found that Barrier scores correlated positively with EMG potentials (recorded from the frontalis muscle) and with GSR reactivity, but negatively with heart rate and systolic blood pressure. Particularly high correlations were found between Barrier scores and physiological reactivity changes from rest to stress. The high Barrier subjects showed here a relatively greater increment of reactivity of their exterior body layers, that is, in terms of EMG's GSR's and peripheral resistance, while the low Barrier subjects showed greater increase in heart rate, stroke volume, and cardiac output, in short, in measures pertaining to the body interior. It is suggested that the more definite an individual's body image boundary, the greater is the increment in body exterior responses under stress and the less the increase in body

interior responses. Most responsive to stress among higher Barrier subjects was peripheral muscular tension, while this variable turned out to be the least responsive one in the low boundary subjects. In this latter group, the heart rate was shown to be the most responsive variable.

Fisher and Cleveland's theoretical model implies the existence of two extreme types of psychosomatic structures with all sorts of intermediary variations.



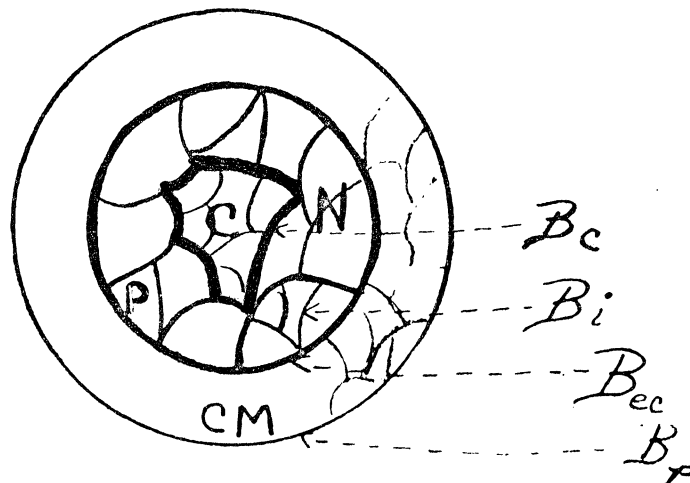
Taking into account the main psychological attributes ascribed to the type A subject, his greater aspirations, self-assertiveness and self-steering tendencies, in short, his higher ego autonomy, the model has some similarities with Freud's speculations concerning the anatomical location of the system Pcpt - Cs., and later on, the location of the ego system. It is sufficient to recall his notion that "the ego is first and foremost a bodily ego", and that the ego is a body surface entity, and that "the ego is ultimately derived from bodily sensations, chiefly from those springing from the surface of the body". Consequently, Fischer and Cleveland are rather close to a Freudian outlook when they state that "it is possible that there is some overlap between the boundary concept and the ego-strength concept".

Block's model

Working from the point of view of Lewinian topology Block (1951) has presented a theoretical description of personality structure which bears some resemblances to the above model. Following Lewin, a distinction is drawn between an inner and an outer personality region, the inner region referring to needs, tensions and pressure systems, and the outer region to the motor-perceptual or the cognitive-motor system, having the position of a boundary zone between the inner-personal regions and the environment. In opposition to Lewin, the environment is not defined as "those things which exist psychologically for a given person at a given time", but as "those features present in a situation which affect or presumably would affect an idealized normative individual".

Diagram II presents a summary of Block's topological person:

DIAGRAM II



The symbols are defined as follows:

- N = Inner-personal need region (the area enclosed by B_{ec})
- P = Peripheral need area (the peripheral parts of N)
- C = Central need area (the central parts of N)
- CM = Cognitive-motor system
- B_c = Boundary between the central and the peripheral need areas
- B_i = Boundary between inner-personal need systems
- B_{ec} = Ego-control boundary (the boundary between the N and the CM regions)
- B_p = Perceptual sieve or perceptual boundary (the boundary between the CM and the objective psychological environment)

The various need or tension systems are differentiated and divided by boundaries, and the same is true as regards the division between the perceived (the subjective) and the objective environment, and that between needs and cognitive-motoric structures.

The need systems are seen as 'utilizing' the cognitive-motoric regions as 'tools' for achieving satisfaction. The need systems are not themselves considered to have any intrinsic directional properties. To obtain a direction implies that they become psychological forces, and to do so they have to pass through or permeate their enclosing boundaries. This is considered to be a function partly of the amount of tension being activated, and partly of the impermeability of the boundaries in question. It is postulated that tension-systems varies in terms of degree of internal differentiation and degree of activation, while boundaries are seen as varying in terms of degree of impermeability (the difficulty with which tensions 'leak' through the boundary), degree of elasticity (the ease or difficulty with which the permeability of a boundary may be changed), and degree of selectivity (their directional qualities).

What is of particular interest is Block's attempt to locate the ego as the resultant of interaction between the perceptual apparatus and the tension-channelizing faculties. Consequently, the ego is identified in the exterior region, divided from need-tensions through an ego-control boundary (having the function of binding tension and of securing tension release under appropriate external conditions) and from the environment through a perceptual sieve (having the function of stimuli protection and the filtering and selection of environmental inputs). The ego structure, in short, is the working together of the ego-control boundary and the perceptual sieve. Although the two boundaries are seen as functionally related and interwoven, they may, it is maintained, under certain conditions show dramatically different properties.

The self is defined as an extremely articulated region within the cognitive-motoric stratum, the psychoanalytic concept of 'id' as the prototype of the need-tension system located in the central inner-personal region, and the concept of 'superego' as a segment of the ego-control boundary differentiated in such a manner as to be rather impermeable to the expression of id tensions. Finally, a distinction is drawn between ego-need and non-ego needs. An ego need is defined as the need to establish and maintain self-esteem. It is conceptualized as a persistent, easily activated tension system in the central inner-personal region, that is manifested behaviorally as 'ego-involvement'.

Within Lewin's theoretical model stable individual differences can be attributed to two factors, the degree of differentiation (i.e., the number of subregions within the need and cognitive-motor systems and their boundary definiteness), and the degree of integration (i.e., the degree and hierarchical organization of the dynamic dependencies between the various systems). By introducing the concepts of ego structure and ego boundary, Block enlarges the model so that it may take into account variations in ego-control manifestations as well.

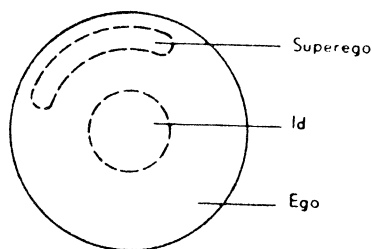
Rommetveit's model

The authoritarian personality is a psychological construct that has been extensively studied and discussed. The most prominent traits ascribed to this personality type are pronounced tendencies to distinguish between in and out-groups, to perceive ingroups as exclusively positive and outgroups as totally negative, to submit to and to identify with strong leaders, symbols of power, and social superordinates, and to disapprove of the weak, the helpless and persons who deviate from the conventional and socially accepted. These traits are all conceived of as stemming from dynamic sources within the personality.

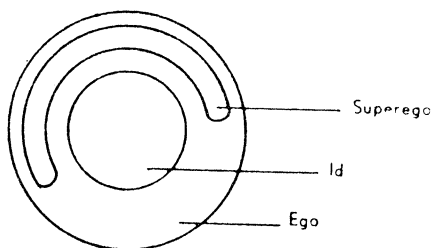
Rommetveit (1958) has attempted to systematize the main characteristics of the structural basis of the authoritarian personality. What is typical of the type, according to Rommetveit - following suggestions of Adorno et al., is the sharp and rather impermeable boundaries between id, ego, and superego motivational systems. To illustrate his viewpoint, he presents the following diagram:

DIAGRAM III

Democratic type



Authoritarian type



The authoritarian person shows constriction and narrowness in his ego functions; a large part of his motives and drives is completely outside his awareness and conscious control, his conscience is locked up and experienced as an external force, and his id impulses are warded off and projected into foreigners, outgroups and mystical powers. The splitting up and the relative isolation of various motivational systems, are reflected in his ideology toward life and in his relationship with other human beings. Either they are unconsciously perceived as symbolic representatives of his superego, or as representatives of his id.

Rommetveit's model accepts a certain structural differentiation, and emphasizes the dimension of dynamic interdependencies and integration. On this dimension, the authoritarian and the democratic personality are seen as located at opposite poles.

It is interesting to note the many similarities existing between Block's and Rommetveit's diagrammatic presentations. According to Block's conceptions, the authoritarian personality may be described as an over-controlled type showing rather impermeable ego boundaries. Following some suggestions by Frenkel-Brunswik (1954), we may also think about the boundaries as being extremely non-elastic. We are referring to Frenkel-Brunswik's notion that the authoritarian personality is consistently inconsistent, that his overt rigidity is paralleled by trends toward a completely fluid, chaotic and overflexible motivational organization, and that these trends may sometimes break through at the manifest level.

By emphasizing the closeness of opposites in personality functioning, Frenkel-Brunswik, is, in fact, stressing the point that an optimal flexibility may be just as different from an extreme flexibility as from rigidity and fixity.

Types of pathology and health

Neither Rommetveit's model, nor Lewin's topology or Block's modification of it, have references to anatomical or somatic correlates or structures. When in spite of this, we have spent some time in describing the models it is because of their intimate connection with some of our earlier thoughts regarding personality functioning.

Turning to Block's model, we are referring in particular to our concepts of tension and excitation as these terms were introduced in an earlier monograph (1965 b). By defining tension as an intrapsychic

accumulation of excitation we implicitly were referring to an ego control boundary and the same is true when we talked about excitation overload being caused by controlling or discharge incapacities. Our term excitation level has similarities to Block's need-tensions.

In our earlier discussion we launched the hypotheses that "mental health is characterized by the ability under appropriate conditions (for instance in a resting, non-demanding situation) to relax, not through a deadening and blocking of internal excitation but through an active and voluntary surrender to the excitation being present, in short, under these conditions to show a small amount of tension combined with neither a high nor an extremely low level of excitation". By the expression 'an active and voluntary surrender to the excitation being present' we were hinting at the ability voluntarily to weaken the ego boundaries to the point of letting the need-tensions being present permeate relatively freely into the cognitive-motoric region. In order for such a flow to occur we have postulated the presence of a high degree of integration between various systems so that the person in question doesn't get over-excited and overwhelmed when his controlling boundaries are weakened or abolished. In fact, we have considered this surrendering ability very much synonymous with psychological integration.

Following this line of thought we may consider an active tension and a high as well as an extremely low level of manifest excitation (in a resting situation), as indications of an inadequate integration. By examining further a person's position on these two variables it may even be possible to make inferences about the nature of his integration deficiencies, and subsequently about his type of psychopathology. (cf. 1965 b, 32 ff).

In a recent article by Holt (1965), a sharp distinction is drawn between ego autonomy based upon 'freedom from' and 'freedom to' components respectively. A person may have erected solid and efficient barriers toward his inner need-tensional systems, and consequently have obtained a high degree of ego autonomy in one sense of the term, without this implying that he has obtained any significant autonomy in the sense of a functional adaptability, that is, in the sense of being able himself to determine when and where to erect barriers and to let them fall. Ego autonomy, Holt suggests (following some earlier suggestions of Miller - objecting to Rapaport's conceptions in this area), should be defined as a capacity for self-government in relation to both the

demanding and nondemanding (informational) aspects of id and environment. He further suggests that it is related to drive and stimuli thresholds, and that it depends upon a delicate balance of inputs from inside and outside. An interesting point is Holt's conception of the inputs in question as providing a sort of nutriment or tonic support for the ego, and his idea that the maintenance of an ego autonomy requires a continuous support of this kind. He also suggests that the formation of inner and outer thresholds corresponds to the establishment of psychic structures, the principal role of which is to widen the tolerable range of inputs.

We may consider the structures in question as psychological resources furthering psychological differentiation, in Witkin's sense of the term. Consequently, we may interpret Holt as implying that a relationship exist between differentiation and autonomy.

The crucial problem, however, is that high differentiation may be associated both with a freedom-from and a freedom-to-type of autonomy, and that Holt's conceptions concerning thresholds and tonic supports do not really help us very much in getting at this distinction.

Reich's model

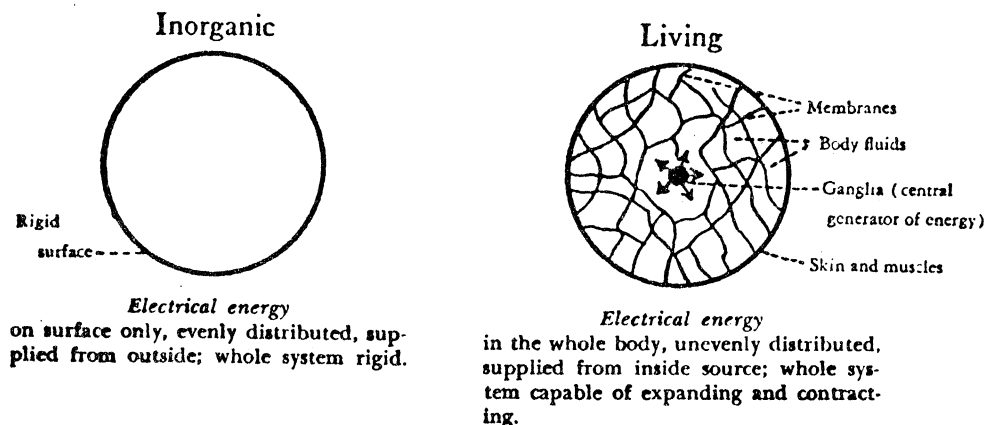
The conception of autonomy as a matter of "freedom-to" has been strongly emphasized in Reich's writings (1942, 1949). At one place, he states that "the degree of character mobility, the ability to open up to a situation or to close up against it, constitutes the difference between the healthy and the neurotic character structure." At another place, that "the genital (or healthy) character has his armor at his disposal; he can put it in operation or out of operation at will." And still at another place: "The genital character is able to change, reinforce or relax his protection mechanisms, while the neurotic character is completely at the mercy of the unconscious mechanisms of his character, he cannot act differently even if he wants to."

When talking about the mobile character as a genital character, Reich refers partly to the fact that the ability to open up and to give oneself is most clearly shown in relation to sexual experiences, and that this ability, in his opinion, is a prerequisite for obtaining a complete sexual orgasm. In describing the genital character, he writes (1949):

"In the sexual act with a loved partner the ego is practically reduced to the function of perception, the armor is temporarily dissolved almost completely, the whole personality is engulfed in the pleasurable experience, without any fear of getting lost in it, for the ego has a solid narcissistic foundation which does not serve any compensatory functions." (p. 169)

A starting point in Reich's train of thought is that the human organism as well as other living bodies are charged with excitation of a vegetative or bioelectrical nature from within. He makes use of the following illustration:

DIAGRAM IV

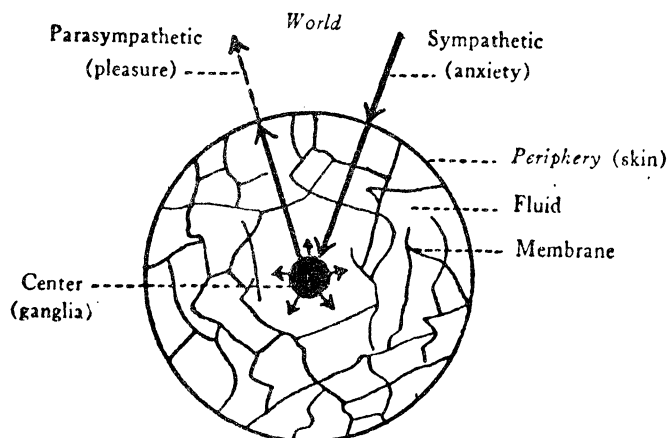


He postulates that an essential characteristic of the living body is the capacity to move along the dimension "toward-the-world-out-of-the-self" and "away-from-the-world-back-into-the-self". He describes the two directions as expansion and contraction, and he links these concepts to the experiences of pleasure and unpleasure respectively. In expansion the skin reddens and the blood is predominantly distributed in the peripheral vessels, while in the other case, the blood withdraws from the periphery and is dammed up in the direction of the center of the body. On the instinctual level, expansion and contraction functions as sexual excitation and anxiety respectively, Reich maintains.

In order to explain these two directions of excitation he refers to the operation of the autonomic nervous system: Expansion and sexuality are mediated through the parasympathetic, and contraction and anxiety through the sympathetic division of this system, and the two parts are reciprocally related. As characteristics of the parasympathetic he refers to increased turgor and surface tension, red and warm skin, opening up, relaxed muscular tonus, swelling and expansion; and as characteristics of the sympathetic, high central tension, shrinking, closing up, pallor, cold sweat, accelerated heart action, increased blood pressure, paralyzed or spastic musculature.

In the healthy organism there exist a continuous spontaneous oscillation between sympathetic and parasympathetic innervations. The life process takes place in a constant alteration of expansion and contraction, Reich states. Again he makes use of a diagram as an illustration:

DIAGRAM V

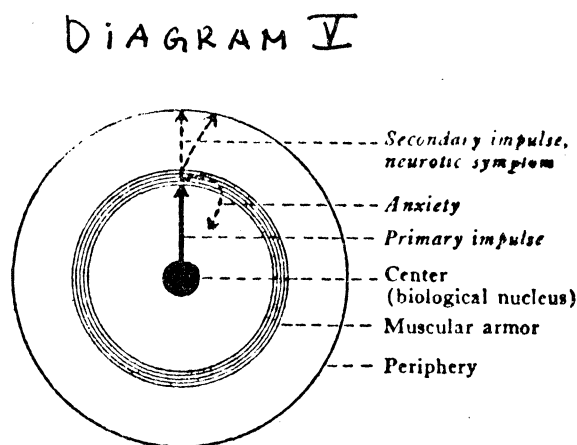


Another of Reich's assumptions is that peripheral muscular tension may serve as a mechanism of protection through which the organism may freeze and ward off unpleasurable as well as pleasurable sensations. He talks about the mechanism in question as an ego armoring involving hypertension of striate muscles.

Since the armoring takes place through muscles which are principally under voluntary control, it follows that an armoring may have a voluntary basis and that the degree to which it is actually maintained under voluntary control is closely linked to a person's ability to experience fully his own body.

It should be noted that Reich does not believe that an armor (whether it is mobile or immobile) can be abolished without any emotional consequences. At the moment an armor gives in, the energies previously being bound will break loose. It is true that the giving-up process may take place in a disordered and uncontrolled fashion as well as in an ordered one, but it will always be followed by 'anxiety' granted this is the affective quality being defended against. In short, it is assumed that in order for a person to swing back to an 'unprotected state' he has to live through in one way or another the affects being situationally warded off. After having lived through a period of stress it is never a matter of going directly and in a push-button-like way back to normal conditions. In other words, the ability to ward off anxiety under specific conditions is considered conditioned upon the person's ability to tolerate it under other circumstances.

In order to illustrate his conception of how an armor may function as a protection mechanism for the ego, Reich presents the following figure:



By differentiating between a mobile and a chronic-automatic armor on the one hand, and the lack of armor and the incapacity to form one on the other, Reich postulates three different personality types. The distinction between persons not being able to get rid of an armor already formed and persons not being able to form an armor, corresponds fairly well to the personality dimension emphasized by Fisher and Cleveland and also by Witkin et al. In addition to this dimension, a second one is suggested, having both the former types at one and the same pole, and a third type, being characterized by flexibility and mobility, at the other opposite pole.

We just mentioned that the ability to form and to abolish an armor is considered closely related to bodily awareness. Consequently, Reich assumes that a chronic armor is kept up always and everywhere because of the person's lack of awareness of what he is doing. This lack of awareness is not a matter of insufficient information only, but is considered intimately and dynamically linked to developmental conflicts, to the splitting up of drive energies, and to the formation of repressions and energetic bindings involving both ego and id components.

Further remarks concerning Reich's model

Because of Reich's many inconsistencies, many crude theoretical conceptions, and many misplaced ideological declarations, he is easy to denounce and criticise. If we concentrate only on the assumptions just mentioned, assumptions which we think are rather basic ones in his writing, the next question is their standing in present day psychophysiological thinking.

Reich's suggestion concerning spontaneous activity and oscillation within the nervous systems has been established beyond all doubt (cf. Roeder, 1955). However, there is no indications that these oscillations are restricted to healthy human beings. It is true that some evidence exist indicating that the periodicities of various autonomic oscillating systems may differentiate between different types of personalities (cf. Doust, 1960), but this is quite another problem.

Although Reich's thought regarding the reciprocal relation between sympathetic and parasympathetic functions has been given some support through Gellhorn's (1964) studies of the anterior and posterior parts of the hypothalamus, the anterior part activating primarily para-

sympathetic functions and the posterior part sympathetic ones, the relationship between these two branches of the autonomic system has been found to be much more complicated than Reich seems to assume. For instance, the intercorrelation between various sympathetic measures has turned out to be surprisingly low. After having cited several studies in this area, Lacey (1959) doubts very much the usefulness of drawing the conventional distinction between sympathetic versus parasympathetic functions, and he also doubts the soundness of making use of 'sympathetic-like' changes as indicators of organismic arousal or behavioral intensity. This does not imply that he believes autonomic responses to be psychodynamically irrelevant. In fact, his position is very much the opposite one.

In one of his own experiments Lacey shows that spontaneous changes in heart rate seem to correspond to variations in an organism's relation to its environment, heart rate accelerations leading to inhibition and rejection of the environment, and heart rate decelerations to excitation and an opening up for environmental inputs.

Of course, considered in isolation these findings offer substantial support to Reich's conceptions since heart rate acceleration and deceleration corresponds to sympathetic and parasympathetic innervations respectively. But Lacey also demonstrates that increased sudomotor activity (i.e., palmar sweating) seems to have exciting effects facilitating environmental intake, and this finding is very much counter to Reich's hypothesis since the activity in question is of a sympathetic nature.

In order to illustrate the complex relationship between the two branches of the autonomic system, Lacey quotes the results of a study by Davis showing the modal response pattern obtained from subjects looking at affectively toned pictures to consist of increased palmar sweating, vasoconstriction, and, in addition - not a cardiac acceleration as one would expect on the basis of conventional thinking, but - a significant cardiac deceleration.

It is interesting to note that these results fit in very well with Fisher and Cleveland's theoretical model. According to their model we would expect just these results when a high barrier person is confronted with an environmental challenge, i.e., we would expect him to become physiologically activated in his body exterior region particularly. It may be recalled that Fisher and Cleveland found increased peripheral resistance and GSR's, and a rather untouched heart rate, to be the typical response pattern to stress among high barrier subjects.

By emphasizing the reciprocal relation, not between the sympathetic and the parasympathetic system, but between body interior and body exterior reactivity gradients, Fisher and Cleveland adopt a position very similar to Reich's without being burdened by the latter's assumptions concerning the relevant mediational physiological systems. As noted, the idea of excitation being distributed either centrally or peripherally is a very central one in Reich's thinking.

In defense of Reich's theoretical position it might be maintained that the reciprocal relation between the sympathetic and parasympathetic system as regards contraction and expansion, closing up and opening up, is not a matter of physiological necessity but a functional characteristic of healthy organisms. Consequently, the divergent concomitance of sympathetic responses and the fragmentation found in autonomic processes generally, might be conceived of as the outcome of various sorts of protectorial devices operating on a more or less permanent basis. Initially, this viewpoint may sound a little far-fetched, but it can not be straightly dismissed.

By protectorial devices we are thinking about the tonic state of various striate muscles. It should be recalled that the potential protective function of striate muscles occupies a very central position in Reich's model. Although he does not explicitly state that he believes that peripheral striate muscle tensions may possess a regulatory function vis-a-vis autonomic processes and activations, this viewpoint fits very well into his general model.

The latter viewpoint is not particularly far-fetched in present day psychophysiological thinking. It is adopted by Gellhorn, for instance, in the article referred to earlier. Gellhorn here suggests that excitation of the anterior and posterior parts of the hypothalamic is associated not only with parasympathetic and sympathetic discharges respectively, but also with characteristic alterations in the activity of the striated muscles, and that this very activity through proprioceptive discharges will be fed back and influence the hypothalamic balance itself as well as the hypothalamic-cortical system. In short, according to Gellhorn, proprioceptive impulses stemming from facial contraction patterns and from body postures have a significant effect on the physiological (e. g. the autonomic) processes underlying emotional states.

In the same article, he writes:

"Although a specific stimulus, mostly in the form of symbols (words seen or heard), appears to be the direct cause of mood or emotion, the setting of the hypothalamic balance through the total quantity of proprioceptive impulses impinging on the hypothalamus per unit of time is of considerable importance. If in receiving the news of a great loss, one would make up one's mind to shut back and forth with chest expanded, this posture would interfere with the development of a sad mood appropriate to the occasion. Conversely, sitting with hunched shoulders as if one had just heard of a tragedy would hardly allow one to experience the uplifting effect of listening to a great Mozart quartet ... Our interpretation of the relation between posture, mood, and emotional responsiveness is supported by experiments involving hypnosis. In numerous tests it has been impossible to induce a certain feeling which is unrelated to the directly suggested motor attitude. If, for instance, the posture accompanying 'triumph' is suggested and 'locked' in hypnosis, a depressive mood cannot be brought about unless the postural setting is changed." (p. 463)

Reich's hypothesis that muscular tension may serve as a defense against anxiety and other emotions has been offered some experimental support from non-hypnotized subjects. In a recent article by Goldstein (1964), on the role of muscle tension in personality theory, reference is made to a study by Kempe (1956) relating responses to stress, to what is called - "a rather unique personality break-down." Goldstein writes:

"He (Kempe) found that those persons who tend to respond to stress by a rather general increase in muscle tension are able to deny emotion and to intellectualize quite easily. They remain aloof from others, maintaining very little regard for social convention. Contrasted with such types are those individuals who, during stress, react by way of the autonomous nervous system. Autonomic responders are emotionally sensitive, prone to worry a great deal, and have fears of not being accepted by others." (p. 414)

I may be asked: Isn't an increased muscle tension an integral part of an organism's response to stress and severe frustrations? It is at all possible to single out the muscular aspect as a protective mechanism (allowing a person to deny emotions and to intellectualize quite easily)?

This is a most relevant question since Gellhorn for instance, seems to imply that parasympathetic activity (released from excitation of the anterior hypothalamus) is generally associated with muscular relaxation, and sympathetic activity (through excitation of the posterior part of the same anatomical structure), with an increased tension of striate muscles. He even states that he believes that the success reported by various relaxation therapies can be accounted for by the fact that they have been

able to reduce the intensity of proprioceptive inputs and thereby accomplished a shift on the hypothalamic balance to the parasympathetic side, resulting in lessened responsiveness to emotional excitation and pain.

We don't object to the view that increased striate muscle tension very often will accompany sympathetic discharges, but to the assumption that this is a physiological necessity. To defend this position it is sufficient to refer to the personality break-down employed by Kempe in the study mentioned above, but we may also refer to a study by Callaway and Dembo (1958), showing that EMG responses tend to decrease when massive sympathetic-like effects are experimentally produced. In this latter study it was also found that this specific combination of responses seem to be related to a narrowed and diminished perceptual function, indicating a distortion in the organism's protective (and intellectualizing) capacities. In this connection, we may also mention a case study by Davis and Malmo (1951) pointing in the same direction. The study was focused on a 27-year-old female, diagnosed as a severe anxiety-hysteric with phobic symptoms, showing some striking changes in her therapy hours, being calm, reasonable, quit, forwardlooking and fairly sure of herself in some hours, and hostile, confused, irritable, disturbed and disorganized in her thinking in others. Contrary to what they expected, Davis and Malmo found the patient's tension level to be significantly higher in the former therapy hours.

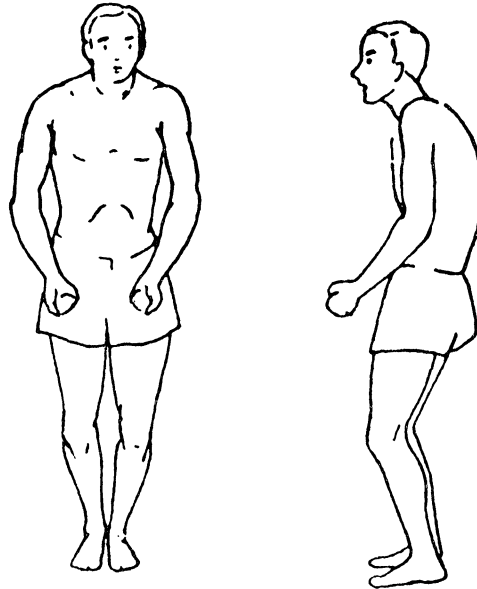
The interrelationship between somatic and autonomic processes is still a rather dark territory. To a large extent Reich's concept of an ego armoring stands and falls on further light being thrown into this area. Unfortunately, Reich's own writing doesn't offer any specific hypotheses as to how the two types of processes are interrelated.

Somatic aspects of an ego armoring

To dig a little further into the problem mentioned above we are going to describe some interesting theoretical viewpoints launched by Feldenkrais and others, working in the area of postural dynamics.

Feldenkrais (1949) takes as his point of departure that the experience of falling (the withdrawal of support) or of a sudden loud noise, usually produce a typical response pattern, a violent contraction of all the flexor muscles, especially in the abdominal region, a halt in breathing, soon followed by a whole series of sympathetic vasomotor disturbances like

accelerated pulse, sweating, etc. The response pattern referred to has been described as the startle pattern. It may be illustrated by the following drawing from Hunt and Landis (1936, p. 312):



The overt pattern consists of: shutting the eyes, a characteristic distortion of the facial features, raising and drawing forward of the shoulders, abduction, forward elevation and inner rotation of the upper arms, bending of the elbows, pronation of the forearm, claspings of the hands, contraction of the abdomen and bending of the legs at the hips and knees.

It has been noted by several observers that not all subjects show the response when presented with an identical stimulus. It has also been pointed out that in one and the same subject the response may vary according to the intensity of the stimulus; from merely a blinking of the eyes only, to blinking and holding of the breath, to - in the case of a very intense stimulus - a general tonelessness of the limbs so that the body collapses (or in a situation of sudden intense danger, to tonelessness, micturition, and defecation).

The viewpoint adopted by Feldenkrais is that the startle pattern is a prototype of a protection response. While the startle pattern proper endures for less than one-half second, the same postural elements will be brought into play also in situations of danger and stress being

more lasting ones. The reason why this is so, is, according to Feldenkrais, that the crouched attitude instils a sense of safety.¹⁾ All the large articulations being flexed, the resistance to the circulation is largely increased and the pulse slowed down.²⁾

He argues that what is sensed as anxiety is disturbances in the diaphragmatic and cardiac regions of the body, and he adds: "The important point is that the sensation of fear and anxiety due to the disturbance of the diaphragmatic and cardiac region are actually abated by maintained general flexor contraction, and in particular that of the abdominal region ... This pattern of flexor contraction is reinstated every time the individual reverts to passive protection of himself."

While a situationally determined flexor contraction may be healthy and instrumental in restoring the individual to an undisturbed state, repeated emotional upheavals with no intermittent time intervals allowing for antigravity functions (i.e., mobility) and tonic redistributions to take place, will have lasting noxious effects interfering with self-regulating nervous co-ordination mechanisms. When this has happened the person will quite often feel that something is wrong or lacking in his postural dynamics and he will start to compensate for it through conscious control and voluntary directives. Voluntary directives inhibiting the extensors are observed in all emotionally disturbed persons, Feldenkrais maintains.

Of particular interest is also Feldenkrais' assumption that a compensatory state of safety will have specific effects in the respiratory realm, i.e., the flexor contraction preventing deep expiration.

We would like to mention a viewpoint on postural dynamics going in the opposite direction of the one just described. According to Shatan

1) In a recent study by Jones (1965) it is suggested that releasing the head from an habitual flexor position have remarkable effects on the subject's psychological orientation. Jones does not however, discuss the defensive aspects of a flexor position.

2) By the slowing down of the pulse we are confronted with what Lacey (1959) has termed an instrumental act of the organism leading to increased ease of environmental intake. It should be noted, however, that in the present instance we are faced with a compensatory mechanism, and consequently, that a fruitful distinction may possibly be drawn between two types of contacting the environment, i.e. between what Reich (1949) has called a genuine and a substitute type of contacting respectively.

(1963), what is providing a sense of safety in emotionally disturbed persons is not the contraction of the flexors but of the extensors. He writes:

"All postures are automatically maintained by a balanced distribution of tone between two muscle groups. These are the flexors or 'movement' muscles, and the indefatigable antigravity or 'postural' muscles, mainly the deep back muscles." (p. 19)

And a little later in the same article:

"Repression of anxiety arousing emotions and impulses induces involuntary changes in muscle tone, posture and movement. The resultant habitual muscular patterns and attitudes help abate chronic anxiety; slow powerful contractions of the postural or antigravity muscles provide a feeling of inner support which allows the patient to keep a grip on himself... We can conceive of the postural muscles as 'hiding places' for repressed emotions." (p. 27)

Shatan indirectly suggests that it is possible to distinguish between three personality types - persons with a genuine inner base of support (based upon the experience of all outlying parts of the body sharing in the ebb and flow of respiration), persons with a compensatory feeling of inner support (based upon a constant and exaggerated antigravity effort), and finally, persons with dependency cravings and lack of inner support (paralleled by flaccid, rather than rigid postural muscles).

It should be noted that the difference between Feldenkrais and Shatan is probably partly of a terminological nature. While Shatan considers the flexors as movement muscles and contrasts them to the antigravity or postural muscles, Feldenkrais speaks about the antigravity function as mobility in general, and contrasts the antigravity extensors with the flexor muscles. While Shatan emphasizes the neurotic person's inability to accept the support of the ground, Feldenkrais is mainly concerned with the neurotic person's incapacity of full extension and erection in relation to the ground.

According to Lowen (1958), we may consider flexor contractions as a more primary or preliminary response in the development of a muscular armor than the extensor contractions. That these two types of muscles should contract to the same extent at the same time is most unlikely since it is well known that contraction of flexors will inhibit their antagonistic extensors. Furthermore, an examination of the startle pattern proper shows quite convincingly that the flexors tend to react earlier in time.

Lowen states:

"Genetically, an armor develops through the immobilization of the aggression of the child. Psychologically, the armor is the expression of the attitude of stiffening to meet an attack rather than striking back. Dynamically, the tension in the front is produced by pulling back the shoulders and pelvis, thus putting all the front muscles on the stretch at the same time that they are contracted. When the front and back of the body are thus encased in a rigid sheath of tight muscles, we can say that organism is armored." (p. 232)

According to this conception the involvement of the antigravity or extensor muscles may be considered a secondary but necessary step in the development of a muscular armor. It would be paralleled by definite changes in the respiratory patterns: Putting all the front muscles on stretch would most likely result in pushing the respiratory movements down in the abdominal region. It would result in a stiff military posture, which, according to several observers, is extremely instrumental in abating fear and anxiety. In fact, from what has just been said we may think about the posture as consisting of a double line of protectional devices.

Concluding comments on healthy respiration

Observations from the field of postural corrections and physiotherapy indicate that abdominal respiration may occur within two quite different postural settings. Discussing the phenomenon of lung emphysema, the existence of permanently enlarged lungs, Heckscher et al. (1951) distinguish between the following types of respiration:

- Normal respiration: Abdominal (primary abdominal)
- Abnormal respiration: I. Mixed abdominal-thoracical
 - a. Low costal
 - b. En-cuirasse (barrel movements)
 - c. High costal
 - d. Dorsal
 - e. Paradoxical
- II. Thoracical
 - a. En-cuirasse (barrel movements)
 - b. High costal
- III. Secondary abdominal

What is important to note is Heckscher's suggestion that a person in the development of an emphysema will tend to pass through a lawful sequence of respiratory patterns. He writes:

"The normal person's respiration is abdominal when he or she is resting or is standing in a resting position. With a stiffening of the posture and/or with mobility of the body, the static function of the respiratory muscles will be changed and as the demands on the respiration is increased, more and more of the thoracic, auxiliary mechanism of respiration is brought into play; the respiratory pattern changes and becomes more and more thoracic. This is a physiological necessity and takes place in all healthy human beings. The abdominal respiration is reestablished however, when the postural stiffening and/or the physical effort is brought to an end. Among patients suffering from emphysema the respiratory changes are lasting ones. In a person who develops an emphysema and who becomes gradually worse through the years, one usually initially find a change from abdominal to a mixed abdominal-thoracic respiration, and later on, a further change to a complete thoracic respiration. If the condition becomes still worse, one may finally observe that the respiration changes again and that it once more becomes completely or partially abdominal (secondary abdominal). This happens when the inspiratory muscles on the thorax and on the neck under the impact of the "short breath" gradually contracts and shortens to such an extent as to reach the uttermost limit for further expansion and pulling upward of the chest. The condition then becomes a critical one, and the organism has, in order to breathe at all, to return to a diaphragmatic type. If an improvement of the condition succeeds, for instance through physiotherapy, one may observe, that the respiration once more becomes more thoracic, for finally - together with a normalization of posture and the size of the lungs, to return to the normal, abdominal type." (p. 46-47)

The main reason for the development of a mixed abdominal-thoracic or a complete thoracic respiration, is, according to Heckscher, a partial or complete immobilization of and downward pull and contraction of the diaphragm. In other words, not only is the diaphragmatic excursions decreased but its expiratory position is significantly lowered.

As noted, a specific type of respiration is called paradoxical. In this instance, respiratory movements exist both in the abdominal and thoracic region, but the abdominal movements go in the opposite direction of those found under normal respiration, i.e. the epigastrium being sucked in during inspiration and pushed out during expiration. The reason behind this type of respiration is assumed to be an immobilization of the diaphragm combined with a reduced muscular tone of the abdominal wall, resulting in the diaphragm and the epigastrium being passively sucked in or up through the inspiratory expansion of the thorax.

In some subjects the mixed abdominal-thoracic respiration is asynchron, i.e. the abdominal movements preceding the thoracic ones.

According to Heckscher, this is a sign of a progressive worsening of the condition. But it is even more so, he states, if the initially expanding abdominal movement suddenly stops at the time of the beginning of the thoracic expansion and is replaced by a movement in the opposite direction. He calls this an asynchron paradoxical respiration.

Although Heckscher makes quite explicit that neurotic postural distortions may contribute to the development of respiratory disturbances (i. e., an expiratory displacement in the direction of the inspirium), his approach is neither a psychiatric nor a depth-psychological one. For instance, he does not at all discuss such concepts as sense of safety, base of support, or ego armoring. In contrast to our own earlier discussion he implies that the stiff, military posture is characterized by thoracic or abdominal-thoracic breathing, and that a secondary abdominal type of breathing is established not as a ~~maneuver~~ measure of defense, but as a respiratory force majeure.

Nevertheless, we think that some of his observations are very significant ones, not the least the observation that a loosening up of postural fixations frequently may change an abdominal respiration type into a thoracic one.

Another reason why we have spent some time in describing the position of Heckscher is his rather explicit statements about what he conceives of as a normal or healthy respiratory pattern.

As far as respiratory rate is concerned, he describes the normal rate as equal to about 16 cycles per minute. Regarding trunk amplitudes, he suggests, as noted above, that normal breathing in a resting situation is exclusively abdominal with the thoracic respiratory muscles existing in a state of relaxation and rest.

We may start out by comparing this latter assumption with the following quotation from Braatøy (1947):

"Recorded with pneumographic curves... the respiration curve of normal subjects in a relaxed, supine position will run as a 'sinus curve'. The respiration curve runs as a recumbent S. From the peak of inspiration the curve runs smooth and well rounded by the downhill expiratory curve in order to oscillate equally smooth in a new upward turn, and so the curve continues with steady, even crescentic oscillations above and below its middle curve..... Normal healthy people breathe in this way, and if one simultaneously reads of their abdominal respiration, one finds here a similar curve parallel to the chest respiration. By direct observation it is difficult to take hold of this in itself fairly peculiar play of the chest cavity expanding smoothly in all directions at the same time; that consequently, the diaphragm pushes the stomach down and the abdominal wall forward at the very same time as the chest expands."
(p. 230)

According to Braatøy, healthy breathing is not exclusively abdominal, but involves respiratory movements of the chest as well. Furthermore, he suggests that the abdominal and the thoracic movements are fully synchronized with respect to time.

This latter assumption is very much questioned by followers of Yoga philosophy and breathing exercises. Here too, however, it is maintained that healthy breathing is a kind of global breathing involving abdominal as well as chest regions. For instance, Yesudian and Haich (1960) distinguish between three types of breathing: 1) abdominal respiration, 2) thoracic respiration, and 3) clavicular respiration. The last type corresponds to what has been called high costal respiration. It implies that the upper part of the thorax only is involved in the breathing movements. A central aspect is the active involvement of the shoulders and the pulling upward of the clavicular. It is a type of breathing demanding a maximum of energy while producing a minimum of ventilation.

According to the authors, the complete Yoga breath comprises all the three types, but, and this is an important point, it comprises them in a particular order or sequence. The breath is described as consisting of three phases; in the first phase, the diaphragm is put into motion and the muscles of the abdominal wall are slowly pressed outward; in the second phase, the lower ribs and the middle part of the chest expands; and finally, in the third phase, the diaphragm is fixed and serve as a base of support for further expansion of the upper part of the thorax. The three phases merge into one rhythmical unit where the one phase passes smoothly into the next. Consequently, the inspiration takes place as one slow rolling movement going from the abdomen upwards. The expiration follows the very same sequence: In the first place, the abdomen withdraws, secondly the ribs, and finally, the clavicular and the shoulders. What is important to note is that a certain overlap is allowed between the inspiratory and expiratory movements. The inspiration starts with the outward push of the abdominal wall, in the next phase the lower ribs expands, and finally, the upper ones and the clavicular, but when the respiratory wave has reached this upper point the abdominal wall and the diaphragm have already started on the expiratory phase. In short, what is considered healthy breathing within yoga circles may very well be described as asynchron breathing with the abdominal movements preceding the thoracic ones. This is, of course, quite another respiratory pattern than that described by Braatøy.

It is interesting to note, however, that several Norwegian physiotherapists, belonging to the Büllo-Hansen school, a school being shaped to a large extent by the very close co-operation existing for several years (1946-53) between Büllo-Hansen, a physiotherapist, and Braatøy, a psychoterapist, have expressed opinions about healthy respiration that correspond far more with the Yoga conception mentioned than with Braatøy's description from 1947, quoted above.

According to this group of physiotherapists, it is important to distinguish between a spontaneous and a controlled type of breathing. Spontaneous breathing is considered founded on diaphragmatic movements, but not exclusively expressed in the abdominal region. It is said that characteristic of this type of breathing is that it starts out from an unrestrained diaphragmatic excursion and that it works itself upward as a broad wave from the abdomen until it finally comprises the whole chest quite up to the tips of the clavícula. Consequently, it is implied that we will find not only thoracic as well as abdominal respiratory excursions, but also a certain time lag between the excursions - with the abdominal preceding the thoracic ones.

However, at one particular point the latter viewpoint parts with the Yoga conception. It is related to the question of what constitutes the fixation point for inspiratory movements. While the Yoga view seems to imply that this is partly the head (and the neck) and mostly the active contraction of the abdominal wall - locking the diaphragm by pushing it upwards (serving as a base of support for the expansion of the upper thorax), the opinion of the Norwegian group of physiotherapists is that the only fixation point required is the elasticity and resistance of the abdominal viscera and the abdominal wall. From this point of view, the Yoge type of breathing is not a completely spontaneous one, but involves a number of controlling elements. Most probably, this opinion would be shared by the Yoga followers themselves because of their heavy emphasis just on breathing exercises and controlling procedures. This latter factor appears most clearly when it comes to the breathing rate which in the Yoga tradition should be deliberately slowed down.

In one sense, the Büllo-Hansen school is in complete agreement with Heckscher et al.: Healthy breathing is abdominal breathing and it is not an extremely slow breathing. But the group goes one step further. Granted an optimal state of tone of the abdominal and thoracic muscles, the downward contraction of the diaphragm will push before it the abdominal viscera,

but the start of the resistance of the viscera and of the abdominal wall will soon be reached, and at this moment the abdominal structure increasingly becomes a fixation point for further diaphragmatic action, the effect of which will be to elevate the lower ribs, and subsequently, the upper ones.

If this wave does not occur, i.e., if the breathing movements are restricted to the abdomen region, one of two possibilities exist: Firstly, that an active tension in the thoracic muscles prevents their passive elevation. Secondly, that the tonic condition of the abdominal wall (and maybe even of the pelvic floor) is reduced to such an extent that it does not provide an effective fixation point for the action of the diaphragm. The first of the two alternatives corresponds to Heckscher's concept of 'secondary abdominal respiration', while the second alternative, hypothetically at least, may be linked to Heckscher's 'primary' abdominal' type. By so doing we are in fact suggesting that his conception of the healthy respiratory pattern is not a correct one.

We have gone relatively far in discussing these problems, partly to show that no consensus exist as regards what constitutes healthy respiration, and partly to extend our own framework for interpreting respiratory records in a resting situation.

We have previously suggested in the description of a tentative respiratory ego-maturity scale (1965b, p. 47) that healthy breathing implies a relatively slow rate (but not a too slow one), a certain (not too great and not too small) predominance of the abdominal amplitude (as compared to the thoracic one), and a certain (not too great and not too small) precedence in time of the abdominal movements (again as compared to the thoracic ones). We were basing these suggestions partly on the results of an empirical study comparing the respiratory pattern of mental patients and normal subjects, and partly, on some theoretical considerations of a rather general nature.

It should be noted that we were not at that time closely acquainted with the opinion held by the Norwegian physiotherapists. Consequently, becoming familiar with this opinion has provided a sort of an independent check on our earlier thinking. We would like to add, however, that we are very much set to let the results of coming systematic studies have to final word in this connection.

REFERENCES

- Block, J.H. An experimental study of a topological representation of ego-structure. Unpublished doctoral dissertation, Stanford University, 1951.
- Braatøy, T. De nervøse sinn. Medisinsk psykologi og psykoterapi. Oslo: Cappelen, 1947.
- Callaway, E., & Dembo, D. Narrowed attention. A psychological phenomenon that accompanies a certain physiological change. Arch. Neurot. & Psychiatry, 1958, 79, 74-90.
- Christiansen, B. Thus speaks the body. Oslo: Institute for Social Research, 1963.
- Christiansen, B. Studies in respiration and personality: 1. A preliminary modification of Clausen's respiratory neuroticism scale. Oslo: Institute for Social Research, 1965. (a).
- Christiansen, B. Studies in respiration and personality: 2. Tentative suggestions concerning the interpretation of respiratory patterns. Oslo: Institute for Social Research, 1965. (b).
- Christiansen, B. Studies in respiration and personality. 3. A preliminary version of a respiratory modulation test - its theoretical perspective and empirical foundation. Oslo: Institute for Social Research, 1965. (c).
- Crutchfield, R.S. Conformity and character. Am. Psychol. 1955, 10, 191-198.
- Davis, F.H., & Malmö, R.B.: Electromyographic recording during interview. Am. J. Psychiatry, 1951, 107, 908-915.
- Doust, J.W. Spontaneous endogeneous oscillating systems in autonomic and metabolic effectors, their relation to mental illness. J. Nerv. Ment. Dis. 1960, 131, 335-347.
- Feldenkrais, M. Body and mature behaviour. London: Routledge & Kegan Paul, 1949.
- Fisher, S. Body-boundary sensations and acquiescence. J. Pers. Soc. Psychol., 1965, 1, 381-383.
- Fisher, S., & Cleveland, S.E. Body image and personality. Princeton, N.J.: Van Nostrand, 1958.
- Fisher, S., & Fisher, R.L. Body image boundaries and patterns of body perception. J. Abnorm. Soc. Psychol., 1964, 68, 255-262.
- Frenkel-Brunswik, E. Further explorations by a contributor to 'The Authoritarian Personality'. R. Christie & M. Jahoda (eds.) Studies in the scope and method of 'The authoritarian personality'. Illinois: Free Press, 1954.

- Goldstein, I.B. Role of muscle tension in personality theory. Psychol. Bull., 1964, 61, 413-425.
- Heckscher, H., et al. Holdningskorrigerende sygegymnastisk behandling. Copenhagen: Munksgaard, 1951.
- Holt, R.R. Ego autonomy re-evaluated. Intern. J. Psychoanalysis. 1965, 46, 151-167.
- Hunt, W.A., & Landis, C. The overt behavior pattern in startle. J. exp. Psychol., 1936, 19, 309-315.
- Jahoda, M. 1 Current concepts of positive mental health. New York: Basic Books, 1958.
- Jones, F.P. Methods for changing stereotyped response patterns by the inhibition of certain postural sets. Psychol. Rev., 1965, 72, 196-214.
- Kempe, J.E. An experimental investigation of the relationship between certain personality characteristics and physiological responses to stress in a normal population. Unpublished doctoral dissertation, Michigan State University, 1956.
- Lacey, J.I. Psychophysiological approaches to the evaluation of psychotherapeutic process and outcome. In E.A. Rubenstein & M.F. Parloff (eds.): Research in psychotherapy. Washington, D.C.: Am. Psychol. Ass., 1959.
- Lowen, A. Physical dynamics of character structure. New York: Grune & Stratton, 1958.
- Reich, W. The function of the orgasm. New York: Orgone Institute Press, 1942.
- Reich, W. Character analysis. New York: Orgone Institute Press, 1949.
- Roeder, K.D. Spontaneous activity and behavior. The Scientific Monthly, 1955, 80, 362-370.
- Shatan, C. Unconscious motor behavior, kinesthetic awareness and psychotherapy. Am. J. Psychotherapy, 1963, 17, 17-30.
- Silverstein, A.B., & Robinson, H.A. The representation of orthopedic disability in children's figure drawings. J. consult. Psychol. 1956, 20, 333-341.
- Rommetveit, R. Ego i moderne psykologi. Oslo: Universitetsforlaget, 1958.
- Witkin, H.A. et al. Personality through perception, New York: Harper, 1954.
- Witkin, H.A. et al. Psychological differentiation, New York: Wiley, 1962.
- Witkin, H.A. Psychological differentiation and forms of pathology. In press: J. Abnorm. Psychol., 1965.
- Yesudian, S., & Haich, E. Yoga og helse (Translated from German "Sport und Yoga") Oslo: Fabritius, 1960.