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# The Journal of General Psychology

Publication details, including instructions for authors and subscription information: http://www.tandfonline.com/loi/vgen20

# An Experimental Study of the Reactions of Neurotics to Experiences of Success and Failure

H. J. Eysenck<sup>a</sup> & H. T. Himmelweit<sup>a</sup> <sup>a</sup> Mill Hill Emergency Hospital, London County Council Published online: 04 Nov 2012.

To cite this article: H. J. Eysenck & H. T. Himmelweit (1946) An Experimental Study of the Reactions of Neurotics to Experiences of Success and Failure, The Journal of General Psychology, 35:1, 59-75, DOI: <u>10.1080/00221309.1946.10544547</u>

To link to this article: <u>http://dx.doi.org/10.1080/00221309.1946.10544547</u>

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### AN EXPERIMENTAL STUDY OF THE REACTIONS OF NEUROTICS TO EXPERIENCES OF SUCCESS AND FAILURE\*

Mill Hill Emergency Hospital, London County Council

H. J. EYSENCK AND H. T. HIMMELWEIT

#### A. INTRODUCTION

There is little doubt that experiences of success and failure, and the individual reactions to these experiences, play an important part in the lives of normal and neurotic subjects. The experimental study of such experiences was begun by Hoppe (19) and Dembo (3) under the general heading ot "level of aspiration," and many recent studies have added considerably to our knowledge of this rather obscure field of motivation, goal-setting, and goal-directed behavior. Excellent summaries are available of this work (Frank, 11; Rotter, 26; and Lewin *et al.*, 22; being probably the most complete), and no effort will be made here to add to their number.

Attempts to relate "level of aspiration" to known factors in the individual's life history and personality have been most successful in connection with the consideration of general cultural factors, such as the influence of group standards (1, 18, 12, 2, 17) and of Social background (9, 16, 20, 27).

Less successful have been attempts to relate "level of aspiration" to personality traits and to type factors such as introversion-extraversion. Hoppe (19), Frank (10), and Jucknat (20) deduce traits which they consider likely to be related to level of aspiration, but fail to provide independent assessments of these traits. Gould and Kaplan (15), Frank (11), and Gardner (13) do attempt to provide such independent assessments, but the great majority of correlations found are well below the level of significance, and as Lewis point out, "the evidence is far too slim to provide a solid basis for future thinking in this area" (22). More successful has been the attempt of Sears (28) and Rotter (cf. 22) to relate types of score-patterns to the habitual reaction-pattern of groups of school children, convicts, and On the whole, however, attempts to relate "level of aspiration" others. to individual personality or to temperamental type have not been as successful as was once confidently expected. In the present paper, an attempt is made to provide experimental evidence pointing towards such a relation,

<sup>\*</sup>Received in the Editorial Office on May 24, 1945.

and to discuss some factors which may make such a relation intelligible in terms of previous work.

We have attacked this problem here by relating "level of aspiration" to the extravert-introvert dichotomy; other methods of approach have also been used and will be reported in a subsequent paper. We took as our starting point two groups of neurotic patients, characterized respectively by the two main types of disorder found in this hospital, viz., the hysterical and the affective syndromes, and attempted to determine whether any differences would appear between them with regard to their "level of aspiration" and various other scores derived from the test. These two main groups emerged from a factorial study carried out on the inter-correlations between psychiatric ratings and psychological tests of 39 temperamental traits, abilities, etc., taken on 700 male neurotic soldiers at this hospital (6). These two groups were also shown to be differentiated with regard to body build (7), autonomic activity (8), intelligence (4), and other psychological functions, and it seemed to us that here we were dealing with a dichotomy which could lav at least some claim to objectivity.

The characteristics which defined these two groups may be of some interest. The affective group was essentially defined by the items: anxiety, depression, obsessional traits, irritability, apathy, headaches, autonomic imbalance, tremors, relatively high intelligence, and leptomorph body-build; the hysterical group was essentially defined by the items: hysterical conversion symptoms, little energy, narrow interests, sex anomalies, unskilled work, hysterical attitude, no group membership, low intelligence, hypochondriacal attitude, and eurymorph body-build. Further items, and a discussion of the precise meaning of the items cited, are given in the original papers.

This factorial differentiation seemed to bear out Jung's well-known statement that "medical experience has taught us that there are two large groups of functional nervous disorders—the one embraces all those forms of disease which are designated hysterical, the other all those forms which the French school has designated psychasthenic. . , . The hysteric belongs to the type of Extraversion, the psychasthenic to the type of Introversion" (21). Similarly, McDougall (23) writes:

There are . . . two great categories of disorder under one or other of which we may attempt to place many of the cases, though without confidence in respect to many of them. . . . These two categories are the dissociative or the hysterical class, on the one hand; the neurasthenic or anxiety class on the other. The liability to disorder of one or other of these two great types seems to be a matter mainly of innate constitution; persons of the extravert temperament seem more liable, under strain, to disorder of the hysteric or dissociative type; those of introvert temperament to disorders of the neurasthenic type.

We have preferred to use the term "affective disorders" or "dysthymia" instead of the obsolescent terms "psychasthenia" and "neurasthenia"; but it would appear that the results of these studies bear out remarkably well the conclusions arrived at on a clinical basis by the two writers mentioned.

Our two experimental groups, i.e., the hysterical and the affective or dysthymic, were selected in a manner described below by two or three of the most experienced psychiatrists in the hospital as relatively good clinical examples of these two reaction-types. In using this method of selection we have had to rely, of course, on the skill and insight of the psychiatrists concerned. We would not maintain that the individuals selected for either of our two diagnostic groups would necessarily all be placed into the same groups by other psychiatrists; it is quite possible that other psychiatrists of equal experience would have reversed some of the decisions. Experimental work on the reliability of psychiatric assessments forbids us to assume complete reliability, or anything approaching it, in the selection of our groups.

On the other hand we do maintain that beyond any doubt the "hysteric" group contained a significantly larger number of patients with predominantly hysterical symptoms and character traits, while the "affective" group contained a significantly larger number of patients with predominantly affective symptoms and character traits. While thus recognizing that the assessments against which we validated our scores are not perfect, and may be seriously in error, we do believe that they have a certain validity when taken over a whole group, and that they are probably considerably more valid than the usual ratings by friends and acquaintances, unfamiliar with the difficulties of such a task, or the usual questionnaires or personality inventories. Faulty diagnoses and ratings would *lower* any differences or correlations we might hope to find; but they would hardly be capable of *creating* statistically significant differences or correlations. Thus such results as may be found will probably be in line with actual fact, but will be attenuated to an unknown extent because of the unreliability of the diagnoses and ratings. They will thus represent a minimum degree of relationship, leaving open the question of just how much greater the actual degree of relationship might be.

If our reasoning up to this point is correct, then it should be possible to frame certain hypotheses concerning the most likely behavior of the hysterics (extraverts) and the affectives (introverts) respectively in situations involving success and failure. These hypotheses derive from the general descriptions of introvert and extravert temperamental characteristics respectively, as given by Jung, McDougall, and other writers, and their verification may be accepted as validation and may lead to an extension of these general descriptions in operational terms.

Our guiding hypothesis was that if Jung is correct in postulating subjectivity or refusal to be determined exclusively by external reality and exof the introvert, the distinguishing mark ternal happenings as subordination of the subjective element to the and objectivity or dictates of external reality as the distinguishing mark of the extravert, then (a) the introvert's level of aspiration as compared with that of the extravert, should be less definitely determined by his actual success or failure on the test, but rather by his subjective attitudes, and (b) the introvert's judgment of his own past performance should show little relation to the objective reality of that performance, while the extravert's judgment should be largely determined by his performance. It is this hypothesis which was tested in the experiment here reported.

### B. THE EXPERIMENT

The performance chosen for our study was selected after a good deal of preliminary work from various types of tasks, all of which had to be discarded because of shortcomings either inherent in the apparatus, or connected with the peculiarities of the neurotic population tested. The apparatus finally chosen was an adaptation of the pursuit-meter called the "Triple Tester" which was constructed by Dr. Craig at Cambridge University. The apparatus consists of a brass drum carrying an Ivorine cover, rotating towards the subject. This Ivorine cover is marked out as a helical "road" with holes punched in it. A "vehicle" in the form of a bronze ball moved sideways on a rack is steered along this road by a steering wheel. The purpose is to keep the ball on this line of holes; each "hit" is scored on an electric counter.

The steering wheel operates the rack through an integrating gear instead of directly. Instantaneous deflection of the vehicle from its path is impossible with this method of transmission, and the subject is forced to anticipate the necessary moves. The more he anticipates, the smoother will be the path which he describes, whereas rapid movements made at the last moment will result in violent oscillations or wobbling of the vehicle which require correction and lead to still worse scores. The test is rather interesting to do, thus providing its own incentive, and the mechanism is sufficiently difficult to understand and manipulate to make for that moderate variability in scoring which is so desirable in tests of "level of aspiration."

The experimental population consisted of 50 male service patients selected

from approximately 500 patients by the Superintendent of the Hospital, or his deputy, on admission, as being particularly hysterical, and as showing few signs of anxiety and depression, and of 50 male service patients similarly selected as showing anxiety and depressive features, in the relative absence of any hysterical traits.

The two groups were equated for age and intelligence. On the average, the age of the hysterics was 29.0 years, that of the affective 30.6. On the intelligence test used, a non-verbal test [the "Progressive Matrix," (25)], which had been used a great deal with neurotic subjects (4, 5), the average scores of the hysterics was 40.5 points, that of the affectives 40.7 points. It is unlikely, therefore, that any differences which might become apparent between the two groups would be due to differences in age or intelligence.

The experimental procedure was as follows: The subject was shown the apparatus and told that by turning the wheel this way and that he could govern the movement of the stylus. Then he was shown how to "catch" the dots, how to follow the pattern, and in general how to carry out the test. He was then told that there were altogether 220 points which he could get; how many did he think he would get? The answer was noted down; the apparatus was started, and the actual performance noted, but not yet communicated to the subject. Instead, he was asked how many points he thought he had got, and the answer was noted down again. Then he was told how many points he had actually got, and he had to say again how many points he was going to get next time. This procedure was repeated 10 times, so that we had altogether 10 estimates of what he thought he would get, 10 performances, and 10 estimates of past performance. The first estimate of what he thought he would get was discarded, as there was no basis for such an estimate in the absence of any experience with the apparatus; most subjects guessed 100. For the sake of convenience, these three groups of scores will be called "Aspirations," "Performances," and "Judgments." Further scores were derived from the interrelations of these scores; they will be described in the next section.

#### C. RESULTS

The first two results to be reported relate to the test directly, rather than to the subjective feelings of the subjects regarding the tests. As regards the average scores, the affective group scored  $73.1\pm32.0$  SD points, as compared with the hysterical group's  $66.3\pm30.1$  SD points, giving a CR for the difference of 1.1. We may conclude therefore that the difference in performance is not statistically significant. The practice effects are almost exactly identical for the two groups. An *index of improvement* was calculated by dividing the average of the 8th, 9th, and 10th scores by the average of the 2nd, 3rd, and 4th scores for each person; the average of these indices was  $1.30\pm.32$  for the affectives and  $1.29\pm.24$  for the hysterics. While the difference between the means is quite insignificant, that between the SD's is significant (CR = 2.00); in other words, there is considerably greater interpersonal variability in the affective groups.

While performance scores can be evaluated by themselves, aspiration and judgment scores only become meaningful when related to performance. From the literature, we have taken over the concepts of "goal discrepancy" and "attainment discrepancy"; by analogy, we have formed various other concepts which will now be defined, together with the two concepts just men-"Goal Discrepancy" is the difference between last previous pertioned. formance and the aspiration for the next trial following knowledge of last performance; it is positive if the aspiration is higher than the performance, and negative if it is lower. "Attainment Discrepancy" is the difference between aspiration for any trial and the actual performance following; it is positive when attainment is higher than aspiration, and negative when it is lower. These two aspects are obviously closely related, and on the average it will be found that where one is positive, the other is negative; this follows from the way in which they are defined. Nine "Goal Discrepancies" and 8 "Attainment Discrepancies" can be calculated from our data for each subject, leaving out the first aspiration as unreliable.

The difference between performance and judgment we have called "Judgment Discrepancy." It is said to be positive when judgment is higher than performance, and negative when judgment is lower than performance. In other words, underestimation of one's past performance gives a negative score, overestimation a positive score. There are 10 such "Judgment Discrepancies."

In view of certain relations observed between these three variables, we were led to introduce a fourth concept, the concept of "Affective Discrepancy." Assuming that any departures from aspirations and judgments close to actual performance were caused by, or at least related to affective and subjective factors, we considered that in subtracting the average "Judgment Discrepancy" from the average "Goal Discrepancy" we would obtain a single score that would give us an estimate of the total affect involved in the whole process, and which would be superior to either of the two single scores. This combined score, therefore, we called "Affective Discrepancy." In Figure 1 are given the average scores on the 10 trials for the two groups, i.e., Aspirations, Performances, and Judgments. In Figure 2 are



shown the derived values, i.e., the Goal Discrepancy, the Attainment Discrepancy, the Judgment Discrepancy, and the Affective Discrepancy related to equalized performance. These figures may make clearer the definitions given above.

The averages and SD's, for the two groups of 400, 450, and 500 Goal Discrepancies, Attainment Discrepancies, and Judgment Discrepancies respectively are given in Table 1, as well as the average intercorrelations of the sets of scores in each of these three tests, for the two groups of 50 patients  $(r_{pq})$ . Also given are the Affective Discrepancy Means and SD's for our two groups, together with the CR.

No CR's are given for the differences between the means of the other three tests in the table. The reason for this omission is that it would be fallacious to calculate CR's from sets of scores that are correlated; the resulting values would attribute to the data a significance which they do not in fact possess.



#### FIGURE 2

If the means of the sets of scores for each subject were used, however, the significance of the differences would be underestimated, because the correlations between the sets are far from perfect. In estimating the significance of the Affective Discrepancy, the means of scores were used, and the CR reported therefore represents an underestimate of the real significance of the difference.

In the case of the other three tests, we have attempted to work out the real significance of our data by means of an approximation formula suggested to us by M. Davies Eysenck. According to this formula:

$$CR = \frac{diff.}{\sqrt{\frac{r_{1}^{2}_{pq} + r_{2}^{2}_{pq}}{2}}\sqrt{\frac{\sigma_{1a}^{2}}{N_{1a}} + \frac{\sigma_{2a}^{2}}{N_{2a}}} + \left(1 - \sqrt{\frac{r_{1}^{2}_{pq} + r_{2}^{2}_{pq}}{2}}\right)\sqrt{\frac{\sigma_{1t}^{2}}{N_{1t}} + \frac{\sigma_{2t}^{2}}{N_{2t}}}$$

in which diff. = the difference between the means of the two distributions,  $r_{pq}$  = the average intercorrelation of the sets of scores for the 50 subjects

in the two groups,  $sigma_a =$  the SD of the average scores, and  $sigma_t =$  the SD of the total scores, the subscripts 1 and 2 referring to the affective and the hysterical groups, respectively.

When this correction is applied, we find that a difference as large as the observed difference in the expected direction would occur by chance only 5 times in 100 in the case of the Attainment Discrepancy (P = .05), 6 times in 100 in the case of the Goal Discrepancy (P = .06), and twice in 100 in the case of the Judgment Discrepancy (P = .02). In the case of the Affective Discrepancy, where no correction was applied, thus giving us an *under*estimate of the *true* significance, there are only 4 chances in 1,000 of obtaining a difference as large as the observed difference in this direction (P=.004).

These results are statistically significant as they stand, and indicate that on repetition of the test on a different sample of patients similarly chosen similar differences between the groups would appear. Several further samples as patients have in fact been tested, both with this and with other tests, and in each case the results have confirmed the main conclusions of this paper. These further applications of tests of "Level of Aspiration" and "Judgment of Past Performance," both on neurotic and on normal subjects, will be reported later; they are mentioned here merely to indicate that our findings are not due to chance, or conditioned by the nature of one particular test, but are in fact fundamentally characteristic of the two groups studied.

It will be seen that for each Discrepancy except the Judgment Discrepancy the SD is larger for the affective group than for the hysterics; these differences are statistically significant. (This effect is not due to the fact that the affective group also have the higher average scores; there is no justification for using the coefficient of variation, for instance, because quite clearly our scale of scores has no true zero.) We may consequently accept the data as showing that the affective group in this test tends to show a greater interpersonal variability than the hysteric group. This finding is in line with the results obtained from our analysis of the practice effects.

When the raw scores for the two groups are plotted in the form of a frequency distribution, the reason for the larger SD's of the affective groups is seen to lie in the fact that while the great majority have *high positive* goal and affective Discrepancies, a small number have *negative* Discrepancy scores. The hysterical groups on the average, have *low positive* Discrepancy scores. Thus the affective curve of distribution shows a slight bimodality, which of course increases the SD of the distribution.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup>This finding should be viewed in the light of Maslow and Mittelmanns' statement that "anxiety attack is always a person's reaction to a situation which he evaluates

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The case is different when we regard intrapersonal variability. For goal, attainment, and judgment discrepancies, the intrapersonal variability is larger for the hysterical group, as can be seen from the fact that the average intercorrelation between successive scores of the subjects in the two groups is larger in every case for the affective group (cf. Table 1). This is fully in

		Affectives	Hysterics
Goal Discrepancy	Mean	11.962	8.820
	SD	21.024	15.218
	$r_{pq}$	+ 0.543	+ 0.496
	Ň	400	400
Attainment Discrepancy	Mean	- 9.464	- 6.144
	SD	25.206	19.229
	$r_{pa}$	+ 0.442	+ 0.320
	N	450	450
Judgment Discrepancy	Mean	- 2.662	.318
	SD	17.317	17.498
	$r_{pq}$	+ 0.355	+ 0.282
	N	500	500
Affective Discrepancy	Mean	14.624	8.502
	SD	14.108	8.498
	CR	2.64	2.64
	N	50	50

TABLE 1

line with what is frequently found with regard to the greater variability of hysterics; it also indicates a certain rigidity and lack of medifiability in the affectives.

This rigidity is brought out more clearly when we make a detailed study of the reactions to individual experiences of success and failure. It is normal to raise one's level of aspiration after success (i.e., after reaching one's previous level of aspiration), and it is normal to lower one's level of aspiration after failure (i.e., after not reaching one's previous goal.) This method of reaction will be called the "Typical Reaction." Exactly 50 per cent were "Atypical" or Abnormal. This is a much higher percentage of atypical reactions than is usually found with normal subjects. Table 2 gives the number of cases in which the subjects raised (+), lowered (-), or kept equal (=) their levels of aspiration after success or failure respectively.

in terms of his image of himself (self-esteem) and of other individuals (security feeling)" (24). High positive Discrepancy Scores may be interpreted as attempts to bolster up self-esteem, negative Discrepancy Scores as attempts to maintain security feeling.

	Success			Failure		
	+	=		+	. ==	
Affectives	114	37	6	37	139	67
Hysterics	132	29	3	46	105	85

**TABLE 2** 

This table shows that after failure in 53 per cent  $\pm$  3.2 per cent of the cases the affectives tend to keep their level of aspiration equal, while in only 44 per cent  $\pm$ 3.2 per cent of the cases do the hysterics do so. This difference is statistically significant. Similarly, in 28 per cent  $\pm$ 3.6 per cent of the cases the affectives fail to raise their level of aspiration after success, while in only 19 per cent  $\pm$ 3.1 per cent of the cases do the hysterics fail to do so. This difference is also statistically significant. Keeping rigidly to their level of aspiration, regardless of success or failure, is the most characteristic feature of the affectives as compared with the hysterics; the respective percentages are 44 and 34.

While we have shown that neither with regard to age, intelligence, performance, or improvement are our two main groups differentiated sufficiently to account for the observed differences, it is interesting to determine the intercorrelations of some of these variables, and their correlations with the various discrepancy scores. These correlations were calculated for the whole population of 100 subjects, and it may be noted that when n = 100, a correlation of .20 is significant (p = .05) and a correlation of .25 very significant (p = .01) according to Fisher's method.

Intelligence is not significantly related to the score achieved on the Triple Tester (r = .128). This relative independence of the score from intelligence makes the Triple Tester particularly suitable in investigations of this kind.

Affective Discrepancy<sup>2</sup> shows a non-significant negative correlation with intelligence (r = -.182). Goal Discrepancy and attainment discrepancy correlate significantly but not very highly with intelligence; the correlations are similar in size but of course opposite in sign (r = -.301 and r = .387). As might have been expected, the Judgment Discrepancy, which is a more intellectual function than any of the other Discrepancies, correlates highest with intelligence (r = -.574). There is also a significant correlation between intelligence and tendency to give a normal reaction to failure or success as defined above (r = .206).

<sup>&</sup>lt;sup>2</sup>This lack of dependence of the Affective Discrepancy on intelligence makes it a particularly useful score, especially when no estimate of the subjects' intelligence is available.

The intercorrelations of the various discrepancy scores are interesting. Goal Discrepancy and Attainment Discrepancy are almost interchangeable (r = -.948); this might have been expected from the similarity of manner in which these two scores are derived. Far more important is the fact that both these discrepancy scores correlate with Judgment Discrepancy, the two correlations being -.682 and .638. As these scores are quite independent in the manner in which they are derived, we are probably dealing with a strong, generalized tendency in the minds of our subjects which links these two discrepancies together. It is the existence of such a tendency which justifies us in combining the two separate scores into one "Affective Discrepancy" score.

One might say that a normal judgment discrepancy should be very near the zero value, and that the further from the zero value such a discrepancy was, the less normal should the reaction be called. If this reasoning is correct, we would expect to find a correlation between the Typical Reaction score on the one hand, and Judgment Discrepancy on the other. Such a correlation is actually found; it is curvilinear, eta being —.348. In other words, a low Typical Reaction score is related to a *high* positive or a high negative Judgment Discrepancy, while a high Typical Reaction is related to a *small* positive or negative Judgment Discrepancy.

A few correlations were run between Affective Discrepancy Scores and several other variables concerning the patients, such as modal civilian occupation, quality of education, home conditions in childhood, and abnormality in parents or siblings. The general run of these correlations, most of which are below the required level of significance, favors the "Low Positive Discrepancy Group" as opposed to the "High Positive Group." Thus the "Low Positive Group" contains a significantly higher percentage of N.C.O.'s, (r = .58) and is significantly correlated with satisfactory home conditions (r = .40); this group also contains a significantly lower percentage of cases rated as "aggressive" than does the "High Positive Group" (r = .38). Suggestive correlations, which however failed to reach significance, were found between "High Positive Scores" and unskilled modal civilian occupation (r = .22), abnormality in parents or siblings (r = .24), and poor education (r = .28). The correlations given were calculated as tetrachoric correlations, their PE's being assumed to be 50 per cent higher than those of corresponding product-moment coefficient (14). Thus on the whole, it would appear that a high positive Affective Discrepancy Score is correlated with some of the more undesirable social qualities, while a low positive Affective Discrepancy is correlated with the more desirable social qualities. These results are in good agreement with those obtained by Gould (16), Jucknat (20), Sears (27) and others.

#### D. DISCUSSION

We may now try to summarize our findings and discuss their theoretical import. The first step in our procedure consisted of isolating the two main reaction-types existing in the population of the hospital by means of a factorial analysis; this analysis differentiated very clearly the hysterical and the dysthymic reaction types, which, if we follow Jung and McDougall, may be identified with the extremes of the more general trait of extraversionintroversion. The second step consisted in showing that these two types are differentiated not merely by the subjective assessments of the psychiatrists on whose ratings the factor-analysis was based, but that they can also be differentiated by experimental means, i.e., by morphological measurement, by their autonomic activity, by their responses to intelligence tests, etc.

Having thus obtained two groups of patients, differentiated on the average by their position on the extraversion-introversion continuum, we are in a position to correlate the results of our investigation into the reactions of the patients to success and failure experiences with their position on this continuum, thus shedding light on two problems: (a) We can further strengthen the experimental support in favor of the essential correctness of the division into the two "types" isolated, by showing that the two groups react in essentially different ways to the test situation; and (b) we can ascertain whether the subjective estimates of Jung regarding the extravert and the introvert types are born out by actual experiment, we may be able to extend his characterizations, and we may be able to put qualitative judgments into a more quantitative form.

The first of these problems may be considered solved by the mere quotation of the actual differences observed between the two groups, and the establishment of the significance of these differences. The second problem, however, is of a more theoretical nature, and demands a certain amount of discussion.

Our experimental results may be summarized as follows: (a) The Affective group display a greater *rigidity* than the hysterical group, as shown in the fact that they do not change their level of aspiration in conformity with their scores, and the fact that they show less intrapersonal variability. (b) The affective group show less objective reference than the hysterical group, as shown by the fact that their goal, attainment, judgment, and affective discrepancies are further removed from their actual performances than those of the hysterics. In terms of our experimental evidence, therefore, we may characterize the affective group as showing a more *rigid* and more *subjective* type of mind.

These two main characteristics of the affective group may be reducible to one fundamental trait, viz., a tendency to neglect external reality, and to be dominated instead by subjective factors. Ultimately, rigidity in the face of changing outward circumstances is only one aspect of a subjectivity which refuses to let itself be determined by the urgent claims of objective reality. But this fundamental trait of the affective group, as opposed to the more objective and less rigid attitude of the hysterics, is precisely the trait which according to Jung (21) distinguishes the introvert from the extravert.

Ganz allgemein könnte man den introvertierten Standpunkt als denjenigen bezeichnen, der unter allen Umständen das Ich and den subjectiven psychologischen Vorgang dem Objekt und dem objektiven Vorgang überzuordnen oder doch wenigstens dem Objekt gegenüber zu behaupten sucht. . . Der extravertierte Standpunkt dagegen ordnet das Subjekt dem Objekt unter, wobei dem Objekt der überragende Wert zukommt.

On the whole, then, we may regard the results of this experiment as definitely supporting the main contention of Jung's typology; we find that the patients suffering from the neurotic syndrome which Jung regarded as the prototype of Introversion show, under experimental conditions, reactions indicative of subjectivity, while patients suffering from the neurotic syndrome which Jung regarded as the prototype of Extraversion show, under experimental conditions, reactions indicative of objectivity. In other words, the patients suffering from affective disorders place an emphasis on the Ego and on personal attitudes, affects, and feelings, while patients suffering from hysterical disorders place an emphasis rather on the Object and on factual relations.

In the literature, a tendency to give high positive goal discrepancy scores has often been identified with the concept of "autistic thinking." There certainly appears a considerable similarity between these two traits. Bleuler defines autistic thinking as follows:

Autistic thinking is directed thinking. It reflects fulfillment of wishes or strivings; it eliminates obstacles; in it, impossibilities are thought of as possibilities and realities. This is achieved by facilitation of those associations corresponding to, and inhibition of those conflicting with, these strivings; that is to say, by the mechanism we know as the influence of affects.

This view, too, would seem to receive a certain amount of support from

our investigation, particularly in so far as it links together the influence of affects and the tendency to subjectivity or "autism."

This connection becomes less inviting when we realize that autistic thinking, as ordinarily found in schizophrenia, for instance, would imply an overevaluation of past performances no less than an overevaluation of future possibilities. However, in our work precisely the opposite relation has been found; a significant correlation appeared between overevaluation of future possibilities and an underevaluation of past performance. In fact, we should be inclined to argue that this underevaluation of one's own work is characteristic of the patient suffering from an affective disorder generally, and is intimately linked with the mechanisms producing and maintaining his disorder, while on the other hand overevaluation of his own work is typical of the hysteric in wider contexts than that of a minature life situation such as is presented in our test.

In view of this contradiction, we must leave the question of "autistic thinking" in the affective and hysterical states open. The Jungian analysis would seem to do less violence to the facts than reference to Bleuler's concept. If the meaning of "autism" could be enlarged to include other influences of the affects besides those tending in a favorable direction, i.e., towards success, and mean precisely what the synonymous term "dereistic thinking" implies, viz., thinking divorced from reality, from the object, then "autism" might be used to cover the attitude of the affective group. As the term has its fixed meaning, however, there seems little point in using it in a wider context, where it would only become synonymous with "subjective" and "subjectivity."

#### E. SUMMARY AND CONCLUSIONS

A modified form of the Pursuit Rotor, involving an integrating mechanism, was used in obtaining performance scores, aspiration scores, and judgments of past performances. One hundred male neurotic army patients were tested, 50 of whom showed predominantly hysterical symptoms, while the other 50 showed predominantly affective symptoms. The two groups were equated for age and intelligence. The main hypothesis tested in this experiment was based on Jung's analysis of extraverted (hysterical) and introverted (affective) personality traits, and more particularly on his view that introverts are more affected by subjective factors, while extraverts are more affected by objective factors.

The results showed no significant differences between the groups for performance or improvement on the test. It was found, however, that both as regards their level of aspiration and their judgment of past performances the affective group showed significantly greater deviations from their actual scores than did the hysterical group. Quite generally, the reactions to success and failure of the hysterical group were more objective, taking more account of external reality (test scores), while the reactions of the affective group were more subjective, taking more account of subjective states of mind.

Correlations were found between level of aspiration and judgment of past performance which indicated that "tendency to subjectivity" could be shown to be an important factor common to both these superficially quite unrelated scores. Further correlations were found between intelligence test scores, improvement, level of aspiration, judgment of past performance, and a number of desirable and undesirable social qualities. It was also found that hysterics showed a greater *intra*personal variability, while the affectives as a group showed a greater *inter*personal variability.<sup>3</sup>

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<sup>&</sup>lt;sup>3</sup>We are indebted to the Superintendent of Mill Hill Emergency Hospital for permission to use the clinical material there, and to the psychiatrists who selected the patients for our syndromatic groups for their coöperation. We also have to thank the Rockefeller Foundation for a grant which made this study possible.

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Mill Hill Emergency Hospital Mill Hill London, N. W. 7, England