

THE EFFECTIVENESS OF NEUROTICS AS WORKERS COMPARED TO NON-NEUROTICS

R.H. BROPHY

I. VAN W. RAUBENHEIMER

VOCATIONAL SECTION
SOUTH AFRICAN RAILWAYS AND HARBOURS

DEPARTMENT OF INDUSTRIAL PSYCHOLOGY
UNIVERSITY OF STELLENBOSCH

OPSOMMING

'n Oorsig van die literatuur dui daarop dat dit nie verwag kan word dat neurote op gelyke voet met ander werkers onder normale werksomstandighede kan meeding nie, en dus minder effektiewe werkers behoort te wees. 12 Hipoteses oor die relatiewe effektiwiteit van neurote en nie-neurote in die werksituasie is geformuleer en getoets. Daar word gevind dat neurote nie beduidend swakker werkers as nie-neurote is nie, behalwe ten opsigte van 3 van die 12 kriteria wat gebruik is, nl. ten opsigte van stiptelikheid, siekte rekord en dissiplinerig. Die gevolgtrekking word gemaak dat 'n nuwe oriëntasie tot die probleem van neurose en die neuroot noodsaaklik is en dat neurotiese werkers objektief met betrekking tot werksvermoë beoordeel behoort te word en nie met betrekking tot persoonlikheidstekortkominge waar laasgenoemde nie ter sake is nie.

A survey of the literature relating to neurosis, the neurotic personality and its adaptation problems creates the impression that neurotics must, of necessity, be inferior workers when compared with non-neurotics. An inability of the neurotic to function adequately under what are to others normal circumstances is emphasized by many writers. Buss (1966, p.46) states that many neurotic symptoms are uncomfortable by their very nature. The individual is extremely tense, perhaps even ill, and seeks immediate relief and the ability of such a person to hold a job is impaired. Coleman (1972, p. 217) describes neurotics as "anxious, unhappy, ineffective, and often guilt-ridden individuals who do not ordinarily require hospitalization but nevertheless are in need of therapy".

Coville, Castello and Rouke (1960, pp. 104-105) are of the opinion that an inability to function at capacity level is a common characteristic in all neurotic reactions and Dunlap (1946, pp. 136-139) adds that neurotic persons are unreliable in that the difficulties which they seem to experience make it difficult for them to accept in full the responsibilities that they assume or that they ought to assume. Kisker (1964, p. 264) states that the most basic and

direct neurotic disorder is the anxiety reaction where the psychological defence mechanisms developed by the individual are inadequate to handle the underlying anxieties generated by his conflicts. In its simplest form, the neurotic anxiety reaction is the presence in the patient, at the conscious level, of a disabling degree of anxiety.

When the views of the writers quoted above are compared it will be noted that when referring to the neurotic they use words and phrases such as: "the ability to hold a job is impaired", "inability to function at capacity level", "difficulty in accepting full responsibility", "a disabling degree of anxiety", "ineffectiveness" and "unreliability". The implication to be drawn from the above, and the literature at large supports this view, is that the neurotic will not be able to compete on an equal footing with a non-neurotic under normal working conditions, i.e. that the non-neurotic is a more effective worker than the neurotic.

The authors were of the opinion, however, that such a conclusion would be premature and would represent an oversimplification of a rather involved phenomenon such as work effectiveness. A systematic investigation providing for the development of specific work criteria, the formulation of definite hypotheses and a scientific identification of neurotic and non-neurotic incumbents appeared to be justified. The procedure and some of the major findings of such an investigation are reported in the following paragraphs.

PROCEDURE

Criterion development

In developing the criteria needed to test the hypotheses (to be presented later), the senior supervisory staff of the organisation sponsoring the research were consulted. Workers in this large transport organisation are involved in the reception, breaking-up, shunting, re-assembling and despatch of trains in the Cape Peninsula. From interviews and consultations conducted with them 12 criteria of an effective worker were determined. Six of these criteria were of such a nature that it could be objectively established from the personnel records held by the organisation and six of the criteria could only be established by means of rating of the persons concerned by their supervisors. In addition a thirteenth criterion, total work achievement (also to be rated by supervisory staff) was decided upon.

It was decided to use the junior supervisory staff in the shunting yards to do these ratings as they worked in intimate contact with the workers and were, therefore, in an ideal position to observe the worker closely in the execution of his duties and to assess how

efficiently he performed his allotted tasks. In order to provide a common frame of reference each rater was supplied with written instructions in both official languages on how to set about the practical task of rating the staff. In addition, use was made of a 7-point graphic rating scale recommended by Anastasi (1968, pp. 419-420). A minimum of two, and where at all possible three, supervisors were used to complete the graphic rating scale in respect of each subject.

Inter-evaluator reliability

Before the criterion information could be used, it was necessary that the inter-evaluator reliability be established. The persons selected to act as evaluators in each shunting yard come from similar backgrounds to each other and have progressed to their present positions via the same avenues of promotion. Also, the instructions to evaluators were standardized in every respect. It was, therefore, accepted that they had similar frames of reference which they brought to bear when they evaluated the staff concerned. In view of this the inter-evaluator reliability was calculated in terms of the formulae given by Winer (1962, pp. 127-128) for non-adjusted data.

The reliability coefficients obtained for nine of the ten shunting yards were unsatisfactory, as can be seen from table 1. According to Winer (1962, p. 127) data should be adjusted when there is reason to believe that evaluators do not have a common frame of reference with respect to what is to be judged. In view of the unsatisfactory reliability coefficients obtained the possibility of this being the case had to be considered. It was decided, therefore, to re-calculate the inter-evaluator reliability in terms of the formulae given by Winer (1962, pp. 129-130) for adjusted data.

In view of the fact that the reliability coefficients improved considerably after having been adjusted (see table 1) thus indicating that all the evaluators probably did not have similar frames of reference, it was decided to eliminate the five yards where the non-adjusted reliability coefficients were the lowest for the purposes of the investigation.

Hypotheses

Based on the information secured in developing the criteria the following three hypotheses were formulated:

H₁ : There is no significant difference between neurotics and non-neurotics in respect of their total work achievement.

H₂: There is no significant difference between neurotics and non-neurotics in respect of each of the following elements of work achievement:

- Standard maintained in regard to accident prevention, i.e. safety consciousness.
- Co-operation with other persons.
- Devotion to duty, i.e. preparedness to do their fair share of the work to be done.
- Standard of work, i.e. the use of efficient and economical shunting movements.
- Ability to work without supervision.
- Initiative displayed i.e. ability to act swiftly and autonomously during crises.

H₃: There is so significant difference between neurotics and non-neurotics in respect of each of the following aspects of personnel data:

- Unauthorised absenteeism, i.e. number of occasions absent without permission.
- Reporting for duty late, i.e. number of times reporting late.
- Sickness records, i.e. number of days sick leave taken in a period of 12 months.
- Abuse of alcohol, i.e. number of times under the influence of alcohol while on duty.
- Amenability to discipline, i.e. a willingness to abide by the rules and regulations of the organisation.
- Accident record, i.e. number of shunting accidents involved in during a period of 12 months.

TABLE 1

RELIABILITY COEFFICIENTS FOR
UNADJUSTED AND ADJUSTED DATA

YARD	N	r	radj
1	7	,924	-
2	12	,338	,405
3	16	,620	,904
4	17	,186	,338
5	9	,279	,621
6	48	,681	,735
7	43	,633	,716
8	29	,114	,719
9	17	,633	,696
10	2	,120	,602

The identification of neurotics and non-neurotics

After considering the advantages and disadvantages of both clinical and psychometric identification of neurotic and non-neurotic individuals, it was decided to use psychometric identification. The psychometric instruments used to differentiate the subjects into a neurotic and a non-neurotic group are the Eysenck Personality Inventory (E.P.I.) and the Structured - Objective Rorschach Test (SORT).

The practical and psychometric considerations in favour of using these two instruments (the E.P.I. and the SORT) specifically, are discussed in detail elsewhere (Brophy, 1977, pp.72-82).

Briefly stated, it was decided to use the SORT as a control for the E.P.I. For the purpose of this article however, only the results pertaining to the E.P.I. will be reported. The decision to use the E.P.I. for the identification of a neurotic personality structure was based on the following considerations:

- It is suitable for use with individuals who have a lower intellectual level. (Average I.Q. (Otis) of the sample equalled 83,15 and the average school standard passed equalled std. 6)
- It is a simple Yes - No inventory which is easy to mark manually using templates.
- It gives a direct score for Neurosis.
- It has a "Lie-Scale" to eliminate subjects showing a "desirability response set".
- It is suitable for individual or group administration.

This was important as the staff concerned had to be tested individually or in varying size groups as they could be released from their duties without disrupting the flow of the work.

When the decision had been taken to use the E. P. I. (and the SORT) it was decided to have all the tests administered by the first author. The reason for this decision was to eliminate all extraneous contaminating factors such as different methods of explaining tests, differences in control of the test situation, etc., as far as was possible.

The sample

In order to be able to select the two groups of staff necessary for this investigation, a list was made of all the members of the various grades employed on shunting in the shunting yards of the organisation grouped around the Cape Peninsula who had completed at least 12

months service with the organisation on 15th June, 1976. The number of staff who met with these two requirements, amounted to 401. Of these individuals, 200 were selected by means of random table numbers to take part in the investigation.

In selecting the groups of staff by means of the E.P.I. to form the "neurotic" (N_e) and "non-neurotic" (N_o) groups, it was decided to strictly follow the recommendations in this regard by Eysenck and Eysenck (1964, p. 14). They state that when only Form A as used in this investigation is employed, an L-score (lie scale score) of 4 or 5 would be considered to constitute the cutting point where inventory answers ceased to be acceptable. In view of the foregoing, the cut-off point on the L-scale was set at five. This reduced the random sample of 200 to 93.

Using only the "most normal" and the "most neurotic" extremes of the E.P.I. distribution and eliminating the centre group, the experimental effect (i.e. the influence of neurosis on work achievement) is maximised. In order to ensure this it was decided to set the cut-off points on the N-scale (neurotic score) for the 93 subjects at a score of 6 or less for the Non-neurotic Group (N_o) and a score of 12 or more for the Neurotic Group (N_e). The number of subjects was further reduced when it was decided to use only persons working in the five yards showing the highest inter-evaluator reliability coefficients. This step resulted in the two groups of staff being reduced to $N_o = 23$ (normal group) and $N_e = 16$ (neurotic group).

The significance of differences between means in respect of the work achievement criteria (i.e. Hypotheses 1 and 2) was tested by means of Student's t test. Use of the t test in this instance, however, presupposes two basic assumptions, i.e. that the samples were randomly drawn (which was met by the research design) and that the variances of the two population groups do not differ. The latter assumption was tested by means of the F test. No significant results were found and the writers could proceed to testing the differences by means of the t test.

RESULTS AND DISCUSSION

Table 2 shows that all t values in respect of Hypotheses 1 and 2 were non-significant, whereas table 3 indicates that t tests performed to test H_3 (which did not involve a reduction in data since it was based on objective personnel records) pointed out significant differences with respect to three criterion measures.

The three hypotheses to be tested with respect to work achievement were:

H₁ : There is *no* significant difference between neurotics and non-neurotics in respect of their total work achievement.

This hypotheses was based on total scores in respect of six sub-criteria of work achievement. The hypothesis was supported by the data.

H₂ : There is *no* significant difference between neurotics and non-neurotics in respect of each of the following elements of work achievement:

TABLE 2

Test for Significance of Differences of Means for H₁ and H₂: Reduced Group (N_o = 23 and N_e = 16)

Hypotheses	Criterion	N _o	N _e	df	t*
H ₁	Total Work Achievement	30,776	30,980	37	,113
H ₂	Accident Prevention	4,935	4,990	37	,167
	Co-operation	4,891	4,936	37	,153
	Devotion to duty	5,080	5,114	37	,094
	Standard of work	5,007	4,906	37	,313
	Ability to work without supervision	5,464	5,668	37	,594
	Initiative	5,377	5,489	37	,388

*All t values non-significant

TABLE 3

Test for Significance of Differences of Means for H₃ : Complete Group (N_o = 31 and N_e = 29)

Hypotheses	Criterion	N _o	N _e	df	t
H ₃	Unauthorised absenteeism	,290	,276	58	,060
	Late for duty	,548	,103	58	1,926**
	Sickness records	8,645	15,414	58	1,662**
	Abuse of alcohol	-	-	58	-
	Amenability to discipline	,290	,069	58	1,383*
	Accident record	,419	,419	58	

*p ≤ , 2

**p ≤ , 1

- (a) Accident prevention
- (b) Co-operation with other persons
- (c) Devotion to duty
- (d) Standard of their work
- (e) Ability to work without supervision
- (f) Initiative

Surprisingly, the hypothesis was also supported by the data in respect of all six sub-criteria. In view of what is stated in the literature one would have expected to find that the neurotic scored significantly poorer than the non-neurotic, particularly in respect of sub-criteria (a), (b), (e) and (f). They are, therefore, not only *not* inferior to non-neurotic workers in general, but in respect of the individual aspects of work achievement on which they can be judged, they are the equal of non-neurotic workers.

H₃ : There is *no* significant difference between neurotic and non-neurotics in respect of each of the following aspects of personnel data.

- (a) Unauthorised absenteeism
- (b) Reporting for duty late
- (c) Sickness records
- (d) Abuse of alcohol
- (e) Amenability to discipline
- (f) Accident record

The data supported this hypothesis only in respect of (a), (d) and (f). The aspects not supported by the data were:

(b) *Reporting for duty late*: A significant difference between the neurotic and the non-neurotic groups was found in this aspect, on the ,1 level. The neurotics reported late more frequently than did non-neurotics.

(c) *Sickness records*: A significant difference between the neurotic and the non-neurotic groups was found in this aspect, on the ,1 level. The average number of days sick leave taken by neurotics is significantly higher than the average of non-neurotics.

(e) *Amenability to discipline*: A significant difference between the neurotic and the non-neurotic groups was found in this aspect also, but only on the ,2 level. The neurotics were found to be involved in more disciplinary infringements on average than were non-neurotics.

When the hypothesis testing is considered as a whole, the inescapable inference is that the worker with a neurotic personality structure in general is not a significantly poorer worker

than the worker with a normal personality structure, despite his personality shortcomings as described in the literature. Even those aspects where significant differences were found, were not highly significant. Also, an inspection of these three facets reveals that they can be the less serious of the six aspects of the personnel data tested in the hypothesis.

CONCLUSIONS

The finding of the investigation was against all expectations. The result of the literature survey was such that one would have expected to find that in most respects, and certainly in respect of their total work achievement, the neurotic workers were inferior to their non-neurotic colleagues. That this is not so implies that a fresh orientation to the problem of neurosis and to the neurotic as an individual is necessary.

One of the by-products of the results of this investigation is to pose the question: "Is not the industrial psychologist perhaps negatively biased in respect of the worker with a neurotic personality structure when he considers him to be a poor worker?" This appears to be a general attitude and in many instances tests are used to ensure that such persons are not employed. It would now appear that this negative view is not always, or not completely justified. That the neurotic worker should be judged objectively on his work ability and not on his personality shortcomings, is a clear implication of this investigation.

If the neurotic individual is able to compete on generally equal terms with the non-neurotic (or normal) individual, then no justifiable grounds exist for discriminating against him, for example at employment. The stigma clinging to the neurotic and to the whole problem area of neurosis should be actively countered so that when the claims of neurotics are considered together with those of their non-neurotic colleagues, such consideration be based on objective, factual information and evaluations and not on prejudice.

SUMMARY

A survey of the literature implies that neurotics are unable to compete on an equal footing with non-neurotics under normal working conditions. 12 Hypotheses relating to the relative effectiveness of neurotics versus non-neurotics in the work situation are formulated. Results indicate that neurotics are not significantly poorer workers than non-neurotics, except in respect of 3 of the 12 criteria used, i.e. reporting for duty late, sickness records, amenability to discipline. Conclusions are

drawn that a fresh orientation to the problem of neurosis is necessary and that neurotic workers should be judged objectively on work ability and not on their personality shortcomings.

REFERENCES

- Anastasi, A. *Psychological Testing*. New York: MacMillan, 1968.
- Brophy, R.H. *The Effect of Neuroticism on Job Behaviour*. Unpublished M.Comm. thesis. University of Stellenbosch, 1977.
- Buss, A.H. *Psychopathology*. New York: Wiley, 1966.
- Coleman, J.C. *Abnormal Psychology and Modern Life*. Illinois: Scott, Foresman and Co., 1972.
- Coville, W.J., Costello, T.W. and Rouke, F.L. *Abnormal Psychology*. New York: Barnes and Noble, 1960.
- Dunlap, K. *Personal Adjustment*. New York: McGraw-Hill, 1946.
- Eysenck, H.J. and Eysenck, S.B.G. *Manual of the Eysenck Personality Inventory*. Kent: Hodder and Stoughton, 1964.
- Kisker, G.W. *The Disorganised Personality*. New York: McGraw-Hill, 1964.
- Winer, B.J. *Statistical Principles in Experimental Design*. New York: McGraw-Hill, 1962.
-