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Field Dependence and the Differentiation of Affective States

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Summary: The extent to which anxiety, irritability and depression were differentiated as separate entities associated with characteristic patterns of somatic and cognitive symptoms by field dependent (FD) and field independent (FI) normal female subjects was studied with the Hidden Figures Test and Unpleasant Emotions Questionnaire. In the FI group the correlations between the three emotions were low and non-significant, reflecting a clear-cut differentiation in symptom configuration, as shown by psychiatrists. In the FD group the inter-correlations were significant and positive, corresponding to relatively poor symptom differentiation, comparable to that of a psychiatric patient group. This suggests that the cognitive style variable of field dependence may underly differences in symptom differentiation associated with psychiatrist/patient differences and, more generally, with social class and sex differences.

The problem of establishing whether anxiety states and depressive disorders represent two distinct clinical entities, or whether they should be regarded as variations within a single neurotic disorder, has given rise to much research intended to investigate whether the two disorders can be distinguished in terms of symptomatology. In general, self-report rating scales for assessing the nature and severity of symptoms have failed to demonstrate a convincing distinction between the symptom patterns associated with anxiety and depression, either in patients (Mendels and Weinstein, 1972) or in normal groups (Meites *et al*, 1980). Using both self-report and observer rating scales, Johnstone *et al* (1980) were unable to identify depressed and anxious groups in a sample of neurotic out-patients, and concluded that, for the purposes of drug treatment, distinguishing between the two states was not of practical value. Other researchers, although maintaining the clinical distinction between anxiety and depression, have nonetheless reported that patients in various diagnostic categories covering anxiety and depressive disorders show extensive overlap in symptomatology, and consequently a considerable proportion cannot be reliably assigned to their diagnostic groups on the basis of responses to symptom checklists (Crisp *et al*, 1978; Prusoff and Klerman, 1974; Snaith *et al*, 1976).

Evidence suggesting that anxiety states and depressive illnesses are clinically separate entities comes from a series of studies by Roth and his colleagues. They found that the two disorders were differentiated not only by factors such as previous history, personality, duration, and treatment response, but also by symptom patterns (Gurney *et al*, 1970; Roth *et al*, 1972). In this work, details of symptomatology were elicited by psychiatrists in a carefully standardized structured interview, and no self-rating scales were used. While some symptoms did not differentiate the diagnostic groups, the majority of the symptoms assessed could be distinguished as being significantly more strongly associated with either anxiety or depression.

The possibility that the use of psychiatrists' ratings as the basis for establishing symptomatology may have contributed to the relatively clear-cut separation of anxiety and depression achieved in this study is consistent with several studies which suggest that psychiatrists differentiate symptoms as being associated with particular affective disorders more clearly than do patients. Derogatis *et al* (1971) found that factor analysis of patients' self-ratings on a standard symptom check-list showed a 'general neurotic feelings' dimension not present in the psychiatrists' ratings, patients from the lowest social class showing the highest loadings on this general factor. These findings are consistent with those of Downing and Rickels (1974) who showed that psychiatrists' ratings achieved greater discrimination

between anxiety and depression in patients diagnosed as mixed anxiety-depression than did the patients' self-ratings.

Leff (1978) carried out a study designed specifically to compare patients' and psychiatrists' concepts of anxiety, depression and irritability using a set of 22 symptom constructs derived from descriptions given by neurotic out-patients. The results showed that psychiatrists' ratings of a typical neurotic patient on these scales discriminated the symptoms as being associated with particular emotions much more clearly than did patients' self-report ratings. Thus, the correlations between different emotions were much higher in the patients' data than in the psychiatrists' data. In particular, anxiety and depression were completely discriminated by the psychiatrists but the patients perceived these emotions as being relatively undifferentiated.

In the present study the problem of symptom differentiation is seen from a psychological viewpoint as essentially related to the ability of individuals to perceive and categorize elements of their environment, whether internal or external, as discrete and separate from their contextual background. This capacity has been conceptualized as a dimension of cognitive style designated field dependence/field independence, deriving originally from the work of Witkin and his colleagues. The field independent individual tends to be intellectually analytical, perceptually discriminating, and 'able to keep things separate in experience' (Witkin *et al*, 1971). Such an individual would be expected to show more clear-cut discrimination of neurotic symptoms than a field dependent individual whose global mode of perception would be expected to lead to a more generalized and holistic experience of affective disorder. In addition, field dependent subjects tend to place more reliance on external sources for definition of their attitudes and judgements, and are particularly attentive to cues from others (Witkin, 1965). It is likely therefore that self-report materials, which provide no external cues and no structuring of responses by an interviewer, will show the effects of field dependence most strongly.

Several studies have examined relationships between field dependence and aspects of psychiatric disorder. Of relevance to the present work are findings that field independent patients showed a more differentiated clinical picture than those who were field dependent (Korchin, quoted in Witkin *et al*, 1974); and of a strong positive correlation between field dependence and over-inclusive thinking, a characteristic associated with absence of conceptual boundaries, and diffusion of cognitive processes (LaTorre, 1978). Witkin (1965), in a review of the relationship between psychopathology and psychological differentiation, suggests that the type of disorder developed may be related to level of differentiation, but his analysis does not suggest that general level of symptom intensity is related to field dependence. In accordance with this, Adevai *et al* (1968) reported a similarity in the MMPI profiles of field dependent and field independent groups.

Thus, it would be predicted that groups of field dependent and field independent subjects would differ in the extent to which neurotic symptoms are discriminated but not in the overall symptom levels reported. This prediction was tested in a group of normal subjects using a self-report method closely similar to that described by Leff (1978).

Method

The subjects in this study were female student nurses (n = 58). Their average age was 22 years, and almost all were of British or Irish nationality.

Test materials

Hidden Figures Test (HFT): (University of Toronto, Health Sciences Laboratory). This measure of field dependence is similar in concept to the Group Embedded Figures Test (Witkin *et al*, 1971). It consists of 32 complex geometric figures, in each of which is embedded one of five simple figures, which are shown at the top of the test sheet. In the present work only the 16 even-numbered items were used, and a letter below each indicated which simple figure was embedded in it. The subjects' task was to identify the simple figure in each complex figure and indicate it by outlining and rough shading. After preliminary familiarization with the task, the subjects were given five minutes to complete as many of the 16 test items as possible. The score for each subject was the number of items in which the simple figure was correctly identified. To form the field independent (FI) and field dependent (FD) groups, the total group was divided at the median HFT score. This gave two equal groups (n = 29 in each), HFT scores of 0–6 comprising the FD group, and HFT scores of 7–16 comprising the FI group.

Unpleasant emotions questionnaire: A modified version of the questionnaire described by Leff (1978) was used. The 22 items, 11 describing cognitive symptoms (for instance, 'I feel angry with myself') and 11 describing somatic symptoms, (for instance, 'My heart beats fast') were listed on three pages headed 'WHEN I AM ANXIOUS—', 'WHEN I AM IRRITABLE—', and 'WHEN I AM DEPRESSED—' respectively. Three different versions of the questionnaire were used, with counter-balancing of item order across emotions. The subjects were asked to indicate the extent to which each item described

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how they felt when experiencing the particular emotion concerned, by circling a number on a rating scale from 1 (Not at all) to 5 (Very much indeed).

Statistical treatment

Analysis of the data required comparisons to be made between each pair of mean scores from the set of three scores corresponding to the three emotions. Since no predictions were made about differences between specific means, the Newman-Keuls multiple comparison procedure was used, and significances tested against the studentized range statistic, Q, a more conservative procedure than multiple t-tests (see, for instance, Armitage, 1971).

Results

For each symptom rating scale the mean scores and the variances were calculated for each of the three emotions separately for the FI and FD groups. F-ratio tests showed no evidence of significant differences between the variances of corresponding symptom scores in the FI and FD groups. Product-moment correlation coefficients (high values of which reflect similarity between symptom configurations and hence poor differentiation) were calculated between the mean scores for anxiety and irritability, irritability and depression, and anxiety and depression, in each group, as shown in Table I.

In the absence of significant differences between the variances in the FI and FD groups, differences between corresponding correlation coefficients can be taken as indicating different degrees of differentiation of emotions in FI and FD subjects. In the FD group the correlations are significant for each of the three pairs of emotions, whereas in the FI group all three correlations are small and non-significant, indicating that emotions are more clearly differentiated by FI subjects than by FD subjects. As compared with the values reported by Leff (1978), also shown in Table I, the FD subjects show levels of correlation similar in magnitude, although marginally lower, than patients, while for the FI subjects the levels of correlation are close to those for psychiatrists. The FI and FD groups were also compared in terms of overall mean symptom intensities, averaged over the 22 items, for each of the three emotions. Differences between the two groups were small, and none of the comparisons reached significance.

These analyses were repeated separately for the somatic and the cognitive symptoms. Whilst correlations based on as few as 11 items must be viewed with some caution, it was evident that the two types of symptoms showed different patterns of results, as described below.

(i) *Correlations between emotions for somatic and cognitive symptoms*

As shown in Table II, for somatic symptoms the correlations between emotions, particularly anxiety and irritability, are relatively high in both the FI and FD groups. Although the correlations in the FD group are consistently higher than in the FI group the differences are not large. In contrast the inter-correlations of cognitive symptom scores for the three emotions are considerably lower in the FI group than in the FD group, this being particularly true of the correlation between irritability and depression.

(ii) *Mean intensity levels for somatic and cognitive symptoms*

The mean intensities of somatic symptoms and cognitive symptoms for each emotion are shown in Table III. For both types of symptoms differences between FI and FD groups are small and non-significant. For the somatic symptoms the mean scores for anxiety were significantly higher than those

TABLE I

Product-moment correlations between emotions in the Field Independent (FI) and Dependent (FD) groups of nurses

	Depression/ anxiety	Anxiety/ irritability	Irritability/ depression
FI group	0.13	0.20	0.10
FD group	0.53**	0.48*	0.47*
Psychiatrists[1]	0	0.28	0.18
Patients[1]	0.62**	0.58**	0.49*

** $P < 0.01$; * $P < 0.025$. (Each value is based on 22 symptom constructs).

[1] Data for the psychiatrists and patients, shown for comparison purposes, are taken from Leff (1978).

TABLE II

Product-moment correlations between emotions in the FI and FD groups for somatic and cognitive symptoms separately

	Depression/ anxiety	Anxiety/ irritability	Irritability/ depression
Somatic symptoms			
FI	0.36	0.78**	0.57°
FD	0.46	0.88**	0.62*
Cognitive symptoms			
FI	0.37	0.24	−0.36
FD	0.72*	0.50	0.17

** $P < 0.01$; * $P < 0.05$; ° $P < 0.10$. (Each value is based on 11 symptom constructs).

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TABLE III

Mean intensity scores for somatic and cognitive symptoms

	Anxiety	Irritability	Depression
Somatic symptoms (n = 11)			
FI	2.36±0.55	1.78±0.35	1.80±0.40
FD	2.31±0.58	1.67±0.29	1.77±0.36
Cognitive symptoms (n = 11)			
FI	2.10±0.40	2.38±0.77	2.55±0.82
FD	2.34±0.52	2.36±0.67	2.38±0.66

Significance of differences:

Somatic symptoms: mean scores for anxiety are significantly higher than those for depression and irritability in both FI and FD groups ($P < 0.025$ in each case).

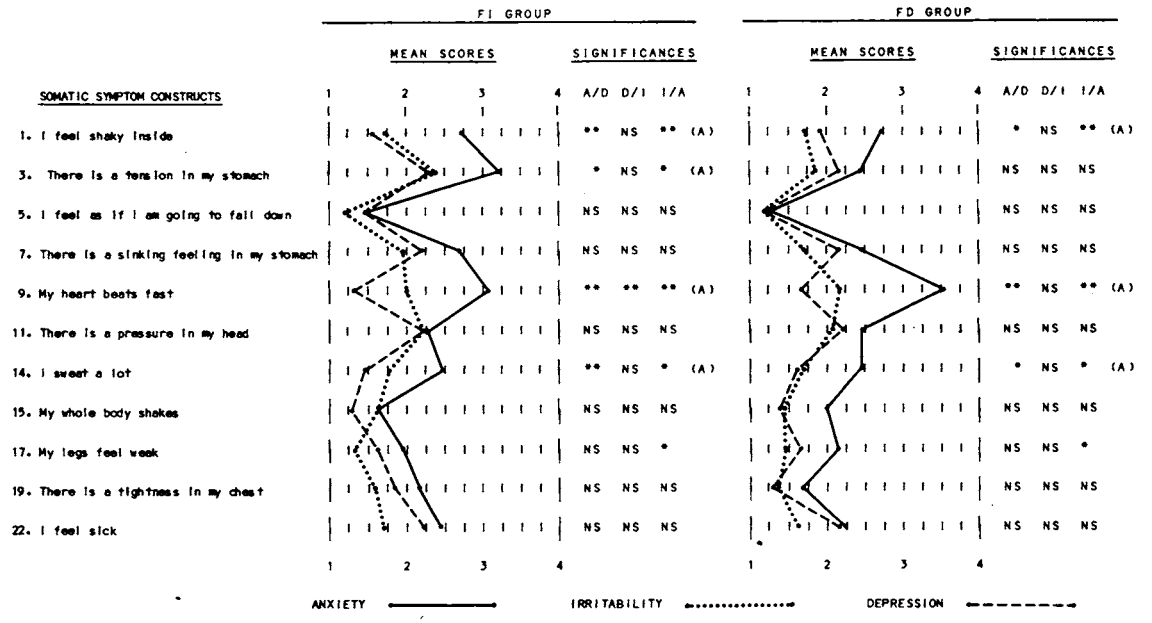
Cognitive symptoms: there are no significant differences between the mean scores for the three emotions in either the FI or the FD group.

for depression or irritability, but there were no significant differences between the three emotions for cognitive symptoms.

These results suggest that the three emotions are differentiated primarily by *intensity* of somatic symptoms (anxiety being associated with more intense somatic response than irritability or depression); and primarily by *configuration* of cognitive symptoms (the FI group achieving more clear-cut discrimination of the cognitive items than the FD group).

(iii) *Symptom profiles*

The *somatic* symptom profiles for the three emotions are shown graphically in Fig 1 for the FI and FD



The first three columns under the heading 'SIGNIFICANCES' give the significance levels of the differences between the mean scores for Anxiety and Depression (A/D), Depression and Irritability (D/I), and Irritability and Anxiety (I/A). All significance tests carried out by the Newman-Keuls multiple comparisons procedure. ** $p<0.01$, * $p<0.05$. The fourth column indicates which emotion, if any, has a mean score significantly greater than those for both the other emotions (A = Anxiety).

FIG 1

FIG 1.—Somatic symptom profiles for FI and FD groups.

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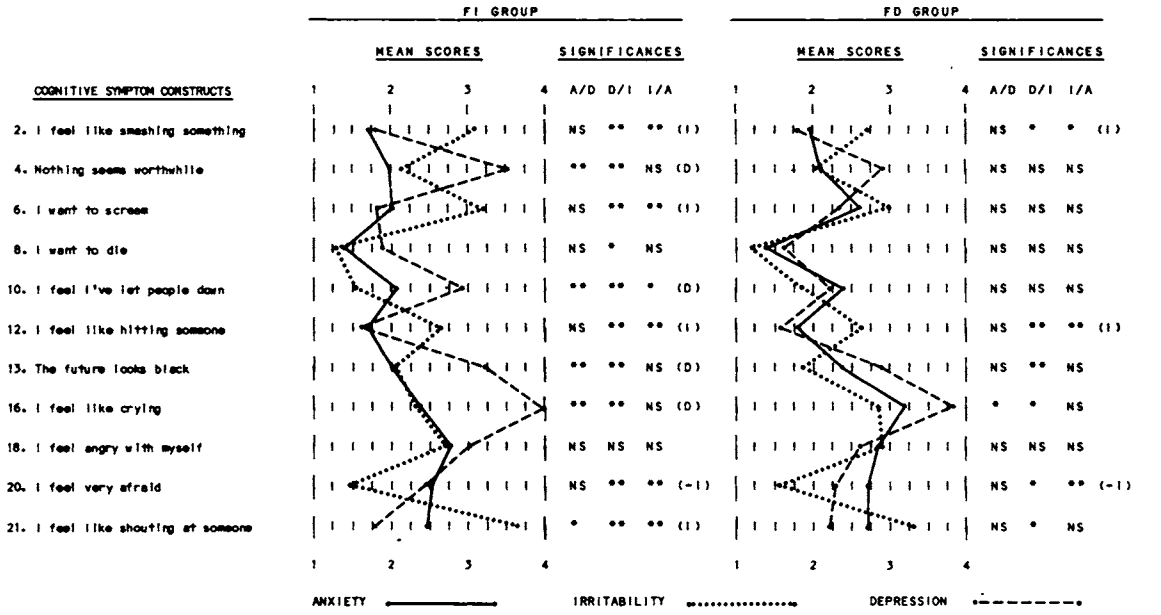
groups. For each symptom, anxiety shows a higher mean score than either irritability or depression in both FI and FD groups. Consistent with the correlational data, there is a general similarity between the profiles for the FI and FD groups, although in the FI group there are a greater number of significant differences between emotions than in the FD group. Overall, somatic symptoms differentiate particularly poorly between depression and irritability.

As shown in Fig 2, *cognitive* symptom profiles for the FD group tend to be superimposed, and relatively undifferentiated, whereas in the FI group individual items (with two exceptions) show high scores for irritability and lower scores for anxiety and depression, or high scores for depression and lower scores for anxiety and irritability. In the FI group nine out of the eleven items have mean scores for one emotion which are significantly different from those of both the other emotions. In contrast, the FD group shows only three such items, anxiety and depression being particularly poorly differentiated.

Discussion

The results of this study showed that, as predicted, field dependence did not affect the overall levels of symptom intensity, but did influence the extent to which individuals differentiated neurotic symptoms as being associated with particular emotions. Overall, the low and non-significant values of the correlations in the FI group indicated relatively clear-cut discrimination, while in the FD group the correlations were highly significant indicating a correspondingly lower degree of discrimination. Thus, the extent to which an individual is able to perceive elements of his environment as discrete entities, separate and distinct from their background, is reflected in the extent to which symptoms are differentiated as being associated with particular emotions.

Field dependence has been found to be related to social class (Gruenfeld and MacEachron, 1975; MacEachron and Gruenfeld, 1978), those of higher socio-economic status showing greater field independence. In addition, females tend to be more field dependent than males (Maccoby and Jacklin, 1974). Both these differences may be of relevance in comparing the extent to which psychiatrists and patients differentiate symptoms. Comparison of the results of the present study with those reported by Leff (1978) indicated that for the FI subjects levels of discrimination were comparable to those shown by



The first three columns under the heading 'SIGNIFICANCES' give the significance levels of the differences between the mean scores for Anxiety and Depression (A/D), Depression and Irritability (D/I), and Irritability and Anxiety (I/A). All significance tests carried out by the Newman-Keuls multiple comparisons procedure. ** $p<0.01$, * $p<0.05$. The fourth column indicates which emotion, if any, has a mean score significantly greater than those for both the other emotions (I = Irritability, D = Depression), or significantly less than both the others (-I).

FIG 2

FIG 2.—Cognitive symptom profiles for FI and FD groups.

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the psychiatrists, while the FD group differentiated symptoms only slightly more clearly than the patients. The overall similarity between the data for psychiatrists and those for the FI group is consistent with studies of field dependence and occupation, reviewed by Witkin and Goodenough (1977), which suggest that psychiatrists, along with a number of other professional groups, tend to be field independent.

Only in differentiating between anxiety and depression did the psychiatrists show a slightly lower correlation value than the FI group, and in this case, although not for the other pairs of emotions, the difference between psychiatrists and patients was markedly greater than that between FI and FD subjects. Since psychiatrists' concepts of the symptom patterns associated with particular emotions are, to a large extent, derived from their training and clinical experience, their relative superiority in differentiating anxiety and depression is consistent with the emphasis given to this aspect of diagnosis in clinical practice.

The correlational data for the FD group in the present study were comparable to the corresponding data for the patient group reported by Leff, although patients showed a slightly lower level of differentiation than the FD group. It is probable that the patient group were predominantly female and of lower social class, and that these factors account for their similarity to the FD group. However, in accordance with the suggestion of Mendels and Weinstein (1972) that intense emotional states may become generalized, the greater intensity of symptomatology among the patients may also have contributed to the difference between patients and normals in levels of differentiation.

When the data for the somatic and the cognitive symptoms were analysed separately, it was apparent that although the FI group showed a higher degree of symptom differentiation than the FD group for both types of symptoms the effect was much more marked for the cognitive symptoms. In the FI group the three emotions showed characteristic cognitive symptom profiles, almost all of the items being strongly associated with either irritability or depression. There were no significant differences in overall levels of symptom intensity. These results (and, although to a much lesser extent, those in the FD group) therefore reflect a configurational or typological model of differentiation. In contrast, the difference between emotions in somatic response was predominantly one of intensity, anxiety showing consistently higher mean scores than either irritability or depression, while configurational trends were of less importance. The high somatic intensity associated with anxiety, and the combination of intensity and configurational trends in the data as a whole, are comparable to the findings reported by Prusoff and Klerman (1974) from their analysis of responses of anxious and depressed patients to the Symptom Checklist (SCL).

Since the concept of field dependence relates to individual differences in cognitive style, specifically the ability to perceive and categorize elements of a perceptual field as separate from their contextual background, the probable explanation for the failure of the FD subjects in the present study to report particular symptom patterns as characterizing specific affective states is that they do not perceive discrete patterns of cognitive and somatic experiences as distinguishable entities. Rather, their experience of affective disturbance tends to be global and diffuse, whereas FI subjects differentiate symptom patterns more sharply. It would be expected, therefore, that FD subjects would respond to self-report symptom checklists in a generalized way, reflecting their overall intensity of disturbance, but not showing clear configurational trends which allow different affective states to be discriminated. Consequently, correlations between different sub-scales would be higher among FD subjects, and separation of the diagnostic groups correspondingly less clear-cut, than among FI subjects. This prediction, which is consistent with the findings of Derogatis *et al* (1971) relating to symptom differentiation by patients of different social classes, could be tested directly by correlational and/or factor-analytic studies of responses of FI and FD subjects to self-report checklists.

If affective disturbance is experienced in a global and generalized way, the appropriate model of symptomatology is a unitary one, in which anxiety and depression constitute a single neurotic disorder, showing little or no distinction between symptom patterns. Such a model would be appropriate to FD subjects. Conversely, the distinct-syndrome model would reflect the experience of FI subjects, who perceive the symptom configurations associated with anxiety and depression as distinguishable entities. Depending on the position of the subjects along the field dependence/field independence continuum, the techniques used to assess symptomatology, and interactions between these factors, one or other model may more closely represent the results obtained. Hence, different studies may result in different conclusions, even when the same self-report scales are used (see, for instance, Mendels and Weinstein, 1972, who compare their results with those of Costello and Comfrey, 1967).

The present study thus raises a number of questions which would merit further investigation. However the major finding, that FI subjects resemble psychiatrists in their capacity to differentiate emotions, while FD

subjects show generalized patterns of affective experience characteristic of patients, suggests that perceptual style may be an important underlying variable influencing the extent to which individuals are able to perceive symptom patterns as distinguishable entities within a general context of affective disturbance.

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