MODERATING EFFECTS OF AGE AND SEX ON THE ASSOCIATION OF MEDICAL DIAGNOSES AND 1-3/3-1 MMPI PROFILES

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Gilberstadt and Jancis[1] found that in patients with the 1-3/3-1 profile ". . . what determines whether they become medical or psychiatric patients is largely a function of factors to which personality tests are not particularly sensitive . . . it would not be meaningful to attempt to make a differential diagnosis of 'functional' *vs.* 'organic' from personality tests such as the MMPI. . . ." They acknowledge, however, that larger samples would be desirable to substantiate their conclusion, which was based on only 12 male general medical patients and on a loose profile criterion (scales 1 and 3 greater than all other scales and either scale 1 or scale 3 equal to or greater than 70). This is essentially equivalent to the least strict rules for defining the 1-3/3-1 profile cited in Schwartz and Krupp[3].

Schwartz and Krupp[3] suggested the use of moderator variables to increase the accuracy of predictions based on the 1-3/3-1 MMPI profile. The original intent of the present study was to explore the possibility of developing an MMPI scale to differentiate functional and organic diagnoses in medical patients. It became apparent, however, in the early stages of data collection, that age and sex were different enough in the functional and organic groups to warrant investigation. Therefore, the purpose of the present study was to determine whether a consideration of age and sex could improve prediction of organic *vs.* functional diagnosis in medical patients with 1-3/3-1 MMPI profiles, that is, to determine if age and sex would moderate the relationship between the 1-3/3-1 MMPI and medical diagnosis.

METHOD

Subjects. The final group of *S*s comprised 178 medical patients (86 males and 92 females) selected from the records of the Mayo Clinic. The sample was selected from the 1,398 profiles that were classified as 1-3/3-1 profiles by Halbower's rules in Table 1. A stratified random sample was selected from this population on the basis of age. The age distribution of the original 1,398 profiles and the study sample is found in Table 2. Of the original 273 profiles, several had to be omitted and were not replaced.[1]

TABLE 1. RULES TO DEFINE THE MMPI 1-3/3-1 PROFILE*

1.	Scales 1 and 3	$\geq$ T70
2.	Scale 2	<Scales 1 and 3 by 10+ T score
3.	Scale K or L	>Scale ? and F
4.	Scale F	$\leq$ T65
5.	Scales 4 through 10	All $\leq$ T70
6.	? (raw)	$\leq$ 20

*The first 5 rules are Halbower's. [2] Rule 6 was added by authors.

Diagnostic Classification. The classification system is a slightly modified version of that presented in Schwartz, Krupp and Byrne[4]. The five-category system was collapsed into three categories. The organic category was defined as significant and primary disease without notable functional components or concomitant psychiatric disorder, *e.g.*, cancer, myocardial infarction, and osteoarthritis. The functional psychologic category was defined as (1) primarily troublesome physical symptoms related to life stress without evidence of significant organic lesion or malfunction and without significant psychiatric disorder, or (2) significant and primary psychiatric disease or disability without evidence of significant organic pathology, *e.g.*, tension headache, functional backache, irritable bowel syndrome, anxiety tension state,

TABLE 2. FREQUENCIES AND PERCENTAGES OF PATIENTS IN STUDY SAMPLE AND TOTAL SAMPLE FOR SEVEN AGE GROUPS

| | Study Sample | | | | Total Sample | | | |
| Age | Male | | Female | | Male | | Female | |
	F	%	F	%	F	%	F	%
70-79	4	4.7	2	2.2	31	5.6	26	3.1
60-69	12	14.0	9	9.8	71	12.7	108	12.8
50-59	27	31.3	26	28.3	162	29.0	223	26.5
40-49	27	31.3	30	32.6	180	32.3	257	30.6
30-39	12	14.0	20	21.7	83	14.9	158	18.8
20-29	3	3.5	4	4.3	18	3.2	52	6.2
<20	1	1.2	1	1.1	12	2.2	17	2.0
	86		92		557		841	

psychoneurosis, personality disorder, schizophrenia, and hypochondriasis. The third category was mixed and involved significant organic lesion or malfunction plus unrelated functional symptoms with or without psychiatric disorder. Examples include coronary insufficiency and psychoneurosis, lumbar disk syndrome and hysteria, inguinal hernia, and chronic tension state. Psychophysiologic disorders with organic lesion believed to be wholly or partly the result of emotional stress such as bronchial asthma or duodenal ulcer were not included in this study.

Procedure. Review of the medical records followed the same procedure as in prior studies[3, 4]. The records were abstracted by a research assistant or by one of the investigators. The data abstracted included medical diagnosis, age, sex, physicians' notes, and pertinent comments found in letters sent to the referring doctor. The third author, a psychiatrist, then reviewed the abstracted histories for purposes of classification. When there was any question as to diagnosis, the complete medical records were reviewed.

RESULTS AND DISCUSSION

Table 3 presents the numbers of patients in the diagnostic categories at various ages. Inspection indicates a sizable number of patients (N = 69; 39%) with only organic diagnoses in comparison to 34% with only psychologic diagnoses. The relative infrequency of organic diagnoses among the patients less than 40 years of age and the relatively larger frequency of only psychologic diagnoses (N = 27/41; 66%) in this age group are apparent. A test for possible sex differences yielded a value for chi square of 5.0 (*df* = 2) and was significant at the .10 level, which indicates a trend for females to have more functional-psychologic diagnoses and fewer pure organic diagnoses than males. This trend led to analysis of each sex group separately.

TABLE 3. FREQUENCIES OF PSYCHOLOGIC, MIXED, AND ORGANIC DIAGNOSTIC CLASSIFICATIONS
FOR MALES AND FEMALES IN SEVEN AGE GROUPS

Age	Females (N = 92)			Males (N = 86)		
	Psychologic	Mixed	Organic	Psychologic	Mixed	Organic
60+	3	4	4	2	4	10
50-59	7	9	10	3	8	16
40-49	10	11	9	8	6	13
30-39	13	2	5	9	2	1
<29	3	2	0	2	1	1

The analysis of age proceeded with a median-age split for each sex separately (males 51 and older vs. 50 and younger; females 46 and older vs. 45 and younger). Table 4 presents the summarized data for each sex, age group, and diagnostic category. In each case, chi square was significant (males: chi square = 11.75 $[df = 2]$, $P < .01$; female: chi square = 7.17 $[df = 2]$, $P < .05$). For the total sample, the chi square of 21.4 $(df = 2)$ was highly significant $(P < .001)$. Thus, the data strongly support the use of age as a significant moderator variable in

TABLE 4. DIAGNOSTIC CATEGORIES FOR MALES AND FEMALES ABOVE AND BELOW RESPECTIVE
MEDIAN AGES

	Psychologic	Mixed	Organic Only
Males			
Older (51+ years)	5	11	26
Younger ($\leq$ 50 years)	19	10	15
Females			
Older (46+ years)	11	16	16
Younger ($\leq$ 45 years)	25	12	12

decision-making that concerns inferences of psychologic or organic diagnoses given the presence of the 1-3/3-1 profile. A further step was to split each sex group in half randomly and inspect the distributions of diagnostic classifications for each "split half" group. In both cases, the chi square tables followed the same pattern, though no formal statistical analyses were performed.

The next step was to determine whether the clinical usefulness of these data could be improved still further by selecting a more optimal cutoff age. Use of the median scores were most helpful in the male group. Thus with the group 51 years of age and older, 26 of 50 or 52% were pure organic diagnoses and only 5 or 12% were pure functional-psychologic diagnoses. In the female group, the upper ages were not associated with differences in the diagnostic categories, and therefore these cases were of less clinical utility. In patients 39 years of age and younger, the number of pure organic diagnoses was even more unusual than the number below the median, especially for males. Only 2 of 16 (12.5%) of the males and 5 of 26 (19%) of the females had pure organic diagnoses. In the age group of 64+ years for males, 7 had purely organic diagnoses and the other 2 had purely psychologic diagnoses. For females, no desirable cutoff above the age of 38 years could be found for clinical usefulness.

Thus, it appears that in the present sample clinical utility is greatest in males less than 40 years of age and older than 63. For females, the best group for diagnostic differentiation appears to be only the group less than 40 years of age. Of course, larger samples of patients with this profile at the age extremes are needed to substantiate the present findings and increase the precision of the age cutoffs.

The present study has demonstrated that considerations of age and, to a lesser degree, sex in medical patients with the MMPI 1-3/3-1 profile can improve significantly the association of medical diagnostic classification compared with base rates for organic only of 39%, for functional-psychologic of 34%, and for mixed of 28%. The relationship of age and medical diagnosis was stronger in males than in females.

SUMMARY

This study investigated the moderating effects of age and sex on the association of organic, psychologic, and mixed medical diagnoses and the Minnesota Multiphasic Personality Inventory (MMPI) 1-3/3-1 profile. A group of 178 medical patients (86 males and 92 females) was selected as representative of the age distribution of a larger sample of patients with this profile. All profiles matched the Halbower rules. The results were as follows: (1) 39% of all patients had only organic diagnoses, whereas 34% had only psychologic diagnoses; (2) psychologic diagnoses alone were found primarily in the group less than 40 years of age (66%); (3) males and females did not differ significantly with regard to diagnostic classification, but a trend existed for more psychologic diagnoses among females; (4) median age split yielded significant chi squares for both sexes with regard to organic only *vs.* some psychologic diagnoses; (5) clinical usefulness was improved with optional age cutoff for each sex.

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