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## **DESIRABLE PSYCHOLOGICAL CHARACTERISTICS OF MEDICAL STUDENTS: A CONVERGENT APPROACH<sup>1</sup>**

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### **ABSTRACT**

In these studies, we explore two hypotheses concerning psychological characteristics of medical school applicants. The first was that consensus would exist on the medical school faculty with respect to desirable psychological characteristics of applicants. With only minor differences between specialties, three factors emerge, self-discipline, psychosocial orientation, and brightness.

The second hypothesis was that peer descriptions could be elicited from resident physicians which could then be related to peer ratings of excellence and to a type of self-report potentially useful in a selection situation. Two samples were utilized in exploring this hypothesis. One hundred sixteen freshman medical students and forty-two residents were tested and compared on objective self-reports. In addition, each resident was asked to rate his or her peers as to skill as a physician and independently to develop descriptive constructs for discriminating their peers into meaningful groupings. The most striking finding is that one trait, the need to understand, is related to all forms of physician excellence, though that characteristic is unrelated to MCAT and GPA in the range of selected applicants. Cluster analysis reveals three personality types: gratification oriented, control oriented, and loners; however, no type related to overall excellence as a physician.

### **INTRODUCTION**

Since at least the 1920's, when studies such as Davison's (1927) demonstrated a relationship between quality of premedical education and failure rate in medical school, procedures for selecting medical students from the applicant pool have served the socially valuable purpose of reducing attrition rates. By a wide margin, the two most widely used and highly efficient criteria for reducing attrition are undergraduate grade point average (GPA) and the Medical College Admissions Test (MCAT) score (Mlott and Schachte, 1972). Current attrition rates are five percent or less, probably at an irreducible minimum, and have been for some time (Shulman and Elstein, 1971, AMA/AAMC Staff Report, 1975).

Though attrition is no longer a significant problem, an applicant pool increasing faster than the number of places available has led to a continuing elevation of scores for accepted applicants. This elevation has not significantly further reduced attrition, but is rationalized on the ground that higher scores imply better ultimate physicians, despite the fact that the empirical evidence is inconsistent with such an implication (Stefanu and Farmer, 1971; Dube, Johnson, and Nelson, 1973). It is quite clear that, in the range of applicants

selected, MCAT and GPA have a modest correlation (accounting for ten to fifteen percent of the variance) with basic science grades, low or no correlation with grades in the last two years of medical school, and a negative correlation with clinical practice (Peterson, Andrews, Spain, and Greenburg, 1956; Howell, 1965; Gough, 1967; Korman, Stubblefield, and Martin, 1968; Haley, D'Costa, and Shafer, 1971; Korman and Stubblefield, 1971; Stefanu and Farmer, 1971).

In part because of these findings, increasing attention has been given to the possibility of selecting medical students on the basis of other factors, on the assumption that such factors might account for the hitherto unaccounted for variance in medical school grades, or, preferably, correlate with later clinical practice.

The general strategy of this study was to examine different ways of generating hypotheses about which psychological characteristics are important in medical school applicants, and, if there is agreement about which characteristics are important in medical school applicants, to explore means of objectively assessing them. We have explored faculty opinion as well as peer ratings of residents to establish which psychological characteristics are thought important, and we have correlated these with ratings of physician excellence and with a set of objective personality measures.

## METHOD

Two general hypotheses were tested in the study. The first hypothesis was that the faculty of a medical school could agree on the importance of potentially measurable desirable psychological characteristics of students. The second hypothesis was that young physicians implicitly characterize each other in terms of psychological characteristics which can be related to peer evaluations of excellence and to objectively measured self-reports. The two general hypotheses were related in that those traits considered desirable by the faculty might converge with the traits developed from peer evaluation and objective self-report.

### GENERAL HYPOTHESIS I

The purpose of this study was to discover whether medical school faculty agree as to the importance of various cognitive and noncognitive characteristics in medical school applicants.

### PROCEDURE

A questionnaire was developed, on which 10 psychological characteristics were each rated for desirability on a 7 point scale. Also included on the questionnaire were four questions about the respondent: the highest degree earned, year of degree, academic rank, and the department in which the individual works. The 10 psychological characteristics were:

A. *Emotional stability, resilience, maturity*: ability to maintain effectiveness in highly stressful situations.

B. *Energy and stamina*: physical and psychological capacity to maintain a high output.

C. *Self-discipline*: ability to actively pursue goals, to budget time, to function effectively and autonomously.

D. *Attention to detail*: willingness to take pains, to devote attention and effort to the maintenance of a standard of perfection.

E. *Sensitivity and awareness of the feelings of other people*: appreciation of pain and suffering as part of the human condition.

F. *Verbal communication skills*: ability to engage conversationally with other people, to stimulate others to talk and to attend to what they say.

G. *Psychological mindedness*: awareness of psychological factors as important determinants to health and physical well-being.

H. *Social responsibility*: awareness of social issues and a willingness to contribute constructively to their resolution.

I. *Intelligence, intellectual complexity, curiosity*: ability to comprehend complicated situations and to think in terms of complicated causal systems.

J. *Originality, creativity, innovativeness*: capacity to develop one's own formulations and to break innovative grounds either theoretically or in terms of application.

Space was available on the questionnaire for the respondent to suggest additional characteristics.

The average rating for each of the ten items was computed for the faculty as a whole and for the faculty categorized by year of highest degree, by type of degree and by specialty or department affiliation. In addition, a principle axis factor analysis with varimax rotation was computed. Upon completion of the principle axis factor analysis and varimax rotation, the data were re-analyzed in terms of factor scores rather than item scores.

## RESULTS AND DISCUSSION

### RESPONSE RATE

A mailing list of 247 potential respondents was obtained. A total of 173 useable responses was received, constituting approximately 70% of the population. Over a third of the respondents either suggested additional psychological characteristics or made comments about the study.

These data suggest the first important finding of our study. Both the very high return rate and the very high occurrence of suggested characteristics indicate a major degree of interest by faculty in this area.

### DESIRABLE PSYCHOLOGICAL CHARACTERISTICS

The most highly rated characteristics were: stability (A), self-discipline (C), and sensitivity (E). The least important characteristics are: social responsibility (H), creativity (J), and psychological orientation (G).

The rankings did not appear to be markedly affected by the type of degree, or by department affiliation. There were, however, two exceptions to this general finding. There was a statistically insignificant trend for psychological sensitivity and psychological orientation to be rated as being more important by the psychiatric faculty than by medicine, surgery, or the basic sciences.

Fifty-four members (22%) of the total population suggested additional characteristics. These characteristics were impressionistically grouped by content

## MULTIVARIATE EXPERIMENTAL CLINICAL RESEARCH

TABLE 1  
Mean Ratings of Variables by Demographic Characteristics of Faculty

Demographic Groupings	Variables									
	A Stability	B Stamina	C Discipline	D Detail	E Sensitivity	F Verbal Skills	G Psychological Orientation	H Social Responsibility	I Intellectual Complexity	J Creativity
<b>Year of Highest Degree</b>										
1930 - 1939	2.7	2.8	2.2	2.2	2.9	3.2	3.0	3.8	2.8	3.5
1940 - 1949	1.9	2.5	2.0	2.8	2.9	3.0	2.9	3.6	2.2	3.0
1950 - 1959	1.8	2.7	2.2	2.5	2.4	2.8	3.7	3.4	2.5	3.8
1960 - 1969	1.9	2.9	2.4	2.7	2.4	3.0	3.2	3.8	2.5	3.8
1970 -	1.9	2.7	2.4	2.5	2.0	3.0	1.7	3.5	2.8	3.4
<b>Degree</b>										
Other	2.0	3.0	2.2	2.0	2.4	2.8	2.8	3.8	2.2	2.8
MA/MS	1.8	2.8	2.5	3.1	2.4	2.4	2.8	4.0	2.8	3.4
Ph.D.	1.9	2.8	2.4	2.5	2.2	3.0	2.9	3.6	2.5	3.8
MD	1.9	2.9	2.7	2.7	2.5	3.0	3.2	3.6	2.5	3.5
<b>Specialty</b>										
Basic Science	1.9	2.9	2.4	2.6	2.3	3.1	3.2	3.6	2.8	4.0
Medicine	1.9	2.9	2.2	2.5	4.5	2.8	3.2	3.7	2.6	3.5
Surgery	1.7	2.6	2.1	2.7	2.7	3.1	3.3	3.8	2.1	3.3
Psychiatry	1.8	2.5	2.6	2.6	1.9	2.8	2.3	3.4	2.4	3.3
Other	2.1	2.9	2.6	2.3	2.4	3.4	3.1	3.4	2.6	3.8

into 36 categories. For example "emotional honesty," "integrity, honesty, morality," and "honest and ethical" were all grouped under the general category of "personal honesty." Included under the heading of "concern for others" were such items as "awareness of other's needs," "respect for the feelings of other people and a desire not to abuse their human dignity" and "ability to be sensitive to cultural characteristics of others."

### FACTOR ANALYSIS

A principle axis factor analysis and varimax rotation were executed on the 10 psychological characteristics in the questionnaire. The 10 variables cluster into three major factors which account for 63.6% of the variability.

Stability had the highest loading (.76) on Factor 1 (accounting for 24% of the variance). Also loading on Factor 1 were energy and stamina (.73), self-discipline (.75), and willingness to take pains (.66). Overall, this appeared to be a measure of self-discipline and energy.

Factor 2 (accounting for 25% of the variance) appeared to be a psychosocial orientation factor, being comprised of sensitivity (.80), verbal communication skills (.67), psychological orientation (.77), and social responsibility (.76).

The highest loading on Factor 3 (accounting for 15% of the variance) comprised creativity (.84), and intelligence and curiosity (.76), thus appeared to be a "brightness" factor.

Results of the re-analysis of the data in terms of factor weights times raw scores are available in Table 2. A difference of .60 from the other mean factor scores was arbitrarily selected as the cutting point.

Using this criterion, psychiatric faculty rated Factor 2 (psychosocial orientation) as being more important than the other four specialty areas. Psychiatry also rated Factor 3 (brightness) as being more important than did other faculty groups perhaps because of their specialty.

Table 2

## MEAN FACTOR SCORES - WEIGHT X RAW SCORE

Degree	N	Factor 1	Factor 2	Factor 3
M.A. or M.S.	5	2.1	- 3.2	5.7
Ph.D.	62	1.9	- 3.2	5.7
M.D.	101	1.9	- 3.5	5.7
<b>Specialty</b>				
Basic Science	31	1.9	- 3.4	6.0
Medicine	71	1.9	- 3.4	5.7
Surgery	31	1.7	- 3.7	5.6
Psychiatry	31	2.0	- 2.8	4.9
Other	9	2.0	- 3.4	5.7
<b>Year of Degree</b>				
1930 - 1939	4	1.9	- 3.5	5.9
1940 - 1949	23	1.8	- 3.4	5.3
1950 - 1959	45	1.8	- 3.3	5.7
1960 - 1969	78	2.0	- 3.5	5.7
1970 -	23	1.9	- 3.0	5.4

## SUMMARY OF RESULTS RELATIVE TO HYPOTHESIS I

The question, then, of whether consensus exists among the faculty as to desirable characteristics can be answered in the affirmative. There is broad agreement that self-discipline is the most important factor, followed by psychosocial orientation and brightness. Also to be taken very seriously are personal honesty and concern for others. This latter characteristic, especially, might have a high degree of overlap with psychosocial orientation.

The tendency of the psychiatric faculty to rate psychosocial orientation as more important than other departments is perhaps a reflection of the content of that specialty. Their emphasis on brightness foreshadowed two later findings of great importance: the relationship between the need to understand and peer

ratings of physician excellence, and the tendency of resident psychiatrists to see research excellence as highly related to overall excellence in psychiatric practice.

### GENERAL HYPOTHESIS II

The second phase of the study tested the expectation that resident physicians implicitly characterize their peers in terms which can be related to objective self-report and to peer ratings of excellence.

### METHOD

Forty-six resident physicians from The University of Texas Health Science Center at San Antonio volunteered for this study. These included eight second year residents from Surgery, Psychiatry, Internal Medicine, and Pediatrics and six residents from Obstetrics-Gynecology and Family Practice. Each resident was given a two and one half hour battery of tests, described below. All the subjects completed the tests with the exception of two residents from Surgery. The ages of the subjects ranged from 20 to 35 years with a mean age of 23 years. This sample consisted of 88 males and 28 females.

Jackson's Personality Research Form (long form AA and BB) was given to these resident physicians. The PRF measures 20 needs — Abasement, Achievement, Autonomy, Change, Cognitive Structure, Defendance, Dominance, Endurance, Exhibition, Harmavoidance, Impulsivity, Nurturance, Order, Play, Sentience, Social Recognition, Succorance, Understanding. In addition, two scores related to item characteristics were included, Desirability and Infrequency. The PRF was selected because it is psychometrically sound form of objective self-report potentially useable as a selection device.

Each resident was also given a special variation of Kelley's Role Construct Repertory Test which we developed, the Peer Psychological Dimensions Test (PPDT). Part I of the PPDT consisted of 12 groups of triads containing the names of the residents within each specialty (10 groups of triads were used with the specialties in which there were only 6 residents). Each name appeared in a triad with every other name at least once. The order of the names within the triads was determined randomly. For each triad, the resident was asked to indicate which two of his peers were alike and different from the third, and to indicate the dimension involved in this discrimination. Thus, in repeated triads, each resident was forced to indicate dimensions he implicitly used in thinking about his colleagues. A chart was provided in Part II of the PPDT which required the resident to rate each of his peers on all of the dimensions derived from Part I.

A system was developed for collapsing the bipolar dimensions of PPDT into a smaller group of related constructs. Inter-rater agreement was established through several training sessions in which the experimenters arrived at a consensus as to which variables to include in specific bipolar dimensions. Inter-rater agreement was found to be 89 percent ( $X = 197.92$ ,  $p < 0.001$ ) on approximately 10% of the constructs. Having attained consensus, the experimenters coded the remaining PPDT constructs independently.

Finally each resident was asked to rank order his peers with respect to overall excellence, excellence as a clinician, as a researcher, and as a teacher.

## RESULTS AND DISCUSSION

## PRF SCORES OF RESIDENTS AND MEDICAL STUDENTS

The resident's scores on the PRF were first compared with those of the normative groups as presented in the manual. The residents differed significantly from the normative sample on ten of the twenty scales. Based on a *z* test, the residents were significantly higher ( $p < .001$ ) than on the scales of Achievement, Autonomy, Endurance, Social Recognition, Harmavoidance, Nurturance, Sentience, Understanding, Infrequency, and Desirability. The higher scores on the traits of Achievement, Autonomy, and Endurance, seemed consistent with the faculty emphasis on self-discipline and with the rigorous demands of medical training. The scores on Sentience and Nurturance were consistent with the faculty emphasis on psychosocial orientation and concern for others, and the scores on need for understanding with the faculty emphasis on brightness. Hence, these successful products of varied medical schools were characterized by the traits thought to be important by the faculty, which apparently and unsurprisingly selects residents on the basis of the same qualities they regard as important in selecting students.

T-tests were performed to discover if the residents differed from a comparison sample of 116 freshman medical students on any of the PRF scales. Only three significant differences are revealed. Medical students scored significantly lower than the residents on the traits of need for Aggression and Change and significantly higher on the need for Cognitive Structure, suggesting that the students were less likely to be quarrelsome and aggressive, and more likely to be meticulous and exacting. Whether this difference is a function of selecting out certain students before the residency level, of maturational changes related to stages of training, or of a coincidental difference in the two groups could best be determined by longitudinal study.

## PPDT RESULTS

More than fifty different bipolar dimensions were utilized by the total resident group. Six were used by at least 25% of the residents, and may be thus regarded as popular. These were Social Ease, Perfectionism, Work-orientation, Predictability, Self-Assurance, and Conventionality.

Table 3

INTERCORRELATIONS OF RATINGS  
ON THE FOUR TYPES OF ABILITY

	Clinician	Researcher	Teacher	Overall
Clinician	1.000 **	.4263**	.8247**	.9318**
Researcher	.4263**	1.000 **	.5114**	.5147**
Teacher	.8247**	.5114**	1.000 **	.8738**
Overall	.9318**	.5197**	.8738**	1.000 **

\*\* < \*\*  $p < 0.001$

## PEER RATINGS OF EXCELLENCE

Correlations between the residents' average ratings of the four types of excellence revealed significant positive intercorrelations. Clinical excellence was significantly related to teaching and overall professional excellence at the 0.01 level. At the 0.05 level, clinical ability was correlated with research ability ( $r = .4263$ ). Research, teaching, and overall professional excellence were all positively correlated with each other at the 0.01 level. These four skills clearly overlapped.

The correlations between clinical, research, and teaching ability and overall professional ability were also found for each specialty. In every specialty, the

Table 4

**CORRELATIONS OF TYPES OF ABILITY  
WITH OVERALL PROFESSIONAL ABILITY BY SPECIALTY**

	Clinician with Overall	Researcher with Overall	Teacher with Overall
Surgery	$r = .920^{**}$	$r = .744$	$r = .915^*$
Psychiatry	$r = .913^{**}$	$r = .813^*$	$r = .940^{**}$
OB-GYN	$r = .962^{**}$	$r = .663$	$r = .906^*$
Family Practice	$r = .981^{**}$	$r = .044$	$r = .972^{**}$
Pediatrics	$r = .926^{**}$	$r = .614$	$r = .704$
Internal Medicine	$r = .941^{**}$	$r = .322$	$r = .832^*$

\*  $p < 0.05$

\*\*  $p < 0.01$

clinical excellence was positively correlated with overall professional excellence ( $p < 0.01$ ). Only in the specialty of psychiatry, was research ability significantly correlated with overall professional ability ( $r = .813$ ,  $p < 0.05$ ). Family practice obtained the lowest correlation between research excellence and overall excellence ( $r = .044$ ). This is consistent with the present thrust of family practice toward a people-oriented or service-oriented approach.

Teaching excellence was significantly correlated with overall excellence in all of the specialties except pediatrics. In pediatrics, the only significant relationship was between clinical ability and overall ability. Factors which affect performance as a researcher or teacher in pediatrics did not appear to contribute significantly to ratings of overall professional ability. A competent pediatrician, therefore, would be one who primarily possesses good clinical skills.

The correlations between the PPDT bipolar dimensions and the average ratings on clinical, research, teaching, and overall ability revealed many significant correlations. The residents who were rated highly as clinicians by their peers were described by them as socially easy, self-assured, unselfish, perfectionistic, reliable, competent, cooperative, intellectual, practical, and

Table 5

SIGNIFICANT CORRELATIONS BETWEEN  
THE FOUR ABILITY RATINGS AND THE PPDT DIMENSIONS

Clinician		Researcher	
Dimension	r	Dimension	r
Socially Easy – Socially Uneasy	-.3961**	Perfectionism – Lack of Perfectionism	-.3914** -.3914**
Perfectionism – Lack of Perfectionism	-.4134**	Aggressive – Passive	-.4095**
Self-Assured – Less Self-Assured	-.5189**	Competent – Less Competent	-.5501***
Predictable – Unpredictable	-.4893**	Evasive – Blunt	-.3841*
Narcissistic – Less Narcissistic	-.3932**	Married – Single	-.6080*
Competent – Less Competent	-.3224**	Intelligent – Less Intelligent	-.7735*
Anglo – Latin American	-.4709*	Competent – Lack of Communication	-.5032*
Intelligent – Less Intelligent	-.6299*	Old – Young	-.9012**
Cooperates with Team – More Individualistic	-.5199*		
Competent – Lack of Communication	-.8977***		
Practical – Impractical	-.7127**		
Mature – Less Mature	-.6421*		

\* p 0.05

\*\* p 0.01

\*\*\* p 0.001

mature. Characteristics of residents rated highly as researchers were perfectionistic, aggressive, competent, blunt, intellectual. Peer descriptions of residents with high ratings as teachers included: perfectionistic, self-assured, reliable, unselfish, aggressive, competent, independent, cooperative, and practical. Residents with high overall professional ability were characterized as perfectionistic, self-assured, reliable, unselfish, aggressive, competent, independent, cooperative, practical, mature, and possessing specific goals.

Critically important relationships between peer ratings of excellence and objective self-report on the PRF were found.

Clinical excellence was positively correlated only with the need understanding on the PRF ( $r = .31, p < .05$ ). Excellence as a researcher was associated with high scores on Understanding ( $r = .43, p < .01$ ) and Infrequency ( $r = .28, p < .05$ ). Teaching excellence was correlated with high scores on Sentience ( $r = .26, p < .05$ ) and Understanding ( $r = .33, p < .05$ ) and low scores on Harmavoidance ( $r = .30, p < .05$ ). High ratings on overall professional ability were related to high scores on Understanding ( $r = .32, p < .05$ ) and low scores on Harmavoidance ( $r = .30, p < .05$ ).

Hence, the single trait of the need to understand, a measure of curiosity and cognitive complexity, correlated with all varieties of excellence rated. This is an especially important finding in the light of the relatively low emphasis placed by faculty on brightness and of the relationship between need to understand and MCAT and GPA scores described below.

Multiple regression analyses of the relationships between objective self-report of the PRF and peer ratings of excellence further emphasized this point. There was a positive correlation of .32 ( $p < .05$ ) between need for understanding and ratings of overall excellence. However, it was not possible to generate a multiple regression predictor for overall excellence using the other PRF scales.

Two PRF variables predicted the average rating of excellence as a clinician. The most predictive variable again was need to understand, in the positive direction. The second most predictive variable was Succorance in the negative direction, suggesting that a resident tends to be rated high as a clinician if he perceives himself as being self-reliant rather than dependent, ingratiating, and defenseless. No other variables of the PRF appeared to add significant predictive variance to excellence as a clinician.

Table 6  
STEPWISE REGRESSION ANALYSES  
PREDICTING EXCELLENCE USING PRF SCALES

	Variable	Multiple R	Gain in Variance Accounted for
Overall Excellence	Understanding (+)	.32	10.2%
Excellence as a Clinician	Understanding (+)	.31	9.43%
	Succorance (-)	.39	5.63%
Excellence as a Researcher	Understanding (+)	.42	17.64%
	Desirability (-)	.47	4.09%
Excellence as a Teacher	Harmavoidance (-)	.45	20.32%
	Understanding (+)	.48	2.73%

Two PRF variables were predictive of ratings of excellence as researcher. Again, the first is the Understanding in the positive direction ( $r = .42$ ). The second was the Desirability scale in the negative direction, indicating that a resident is rated higher as a researcher if he is less likely to describe himself in socially-desirable forms.

Again, only two PRF variables were predictive of the ratings of excellence as a teacher — Harmavoidance in the negative direction ( $r = .45$ ), suggesting that

a resident tends to be rated high as a teacher if he is not likely to describe himself as fearful, self-protecting, and cautious. The second variable again is need to Understand.

The results of the three regression analyses predicting residents' ratings as a clinician, researcher, and teacher suggest that the PRF scales can be used to differentially predict the three ratings. Clinician, researcher, and teacher are not unitary ratings, but they do have elements in common. The Understanding scale of the PRF was important in all four ratings. However, there were also factors unique to each ability.

A regression analysis relating PRF to MCAT scores was also performed as

Table 7

STEPWISE REGRESSION PREDICTING MCAT AVERAGE SCORES  
OF FRESHMAN MEDICAL STUDENTS, USING PRF SCALES,  
AGE, SEX, AND GPA, WHERE  $F = 6.94$ ,  $p < 0.01$

Variable entered		Multiple R	Gain in variance Accounted for
Order	(-)	.3046	9.28%
Infrequency	(-)	.3599	3.67%
Autonomy	(+)	.4301	5.55%
Change	(-)	.4518	1.91%
Sentience	(+)	.4896	3.56%

summarized in Table 6. The PRF scales, and the variables of age, sex, and GPA were used in the analysis. Five variables predict ( $p < 0.01$ ) average MCAT score: Order, Infrequency, and Change scales of the PRF in the negative direction, and Autonomy and Sentience scales of the PRF in the positive direction. While it was thus possible to use noncognitive measures to predict the MCAT, those PRF variables which were predictive of the MCAT, were not predictive of rating of excellence as a clinician, researcher, or teacher, using regression analysis, and especially notable was the absence of a correlation with the crucial variable of the need to understand. This suggests that the MCAT has little to do with performance in medicine, a finding echoing those cited earlier.

Table 7 shows the results of a regression analysis for prediction of freshman medical students' college GPA. Two PRF variables were predictive of college GPA ( $p < 0.01$ ) — the Aggression scale and the Understanding scale (both in the negative direction). Since the Understanding scale was positively correlated with excellence as a clinician, teacher, and researcher and with overall excellence

Table 8

STEPWISE REGRESSION PREDICTING COLLEGE GPA  
OF FRESHMAN MEDICAL STUDENTS,  
USING PRF SCALES, WHERE  $F = 6.59$ ,  $p < 0.01$

Variable entered	Multiple R	Increase in Prediction
Aggression (-)	.2491	6.20
Understanding (-)	.3233	4.25

this would suggest that the standard practice of selecting for admission the students with highest GPA's, may select against high ability in these areas. One might justifiably question whether students with the highest GPA's acquire those traits related to higher scores on the Understanding scale during medical school. However, there was no significant difference between the freshman medical students and residents on the Understanding scale of the PRF. Since there does not appear to be a significant increase in that trait during medical school, the assumption that in the range of accepted students higher GPA's predict better physicians is highly unwarranted and in fact, the reverse may be true.

A final analysis was performed on the PRF data collected from the residents to determine whether the response patterns could be grouped into types. A cluster, or Q-type factor analysis revealed that all of the residents could be assigned to

Table 9

NUMBER OF RESIDENTS SHOWN EACH PERSONALITY PATTERNS  
WITHIN EACH MEDICAL SPECIALTY

	1 Gratification	2 Control	3 Loner	TOTAL
Medicine	4	2	2	8
Family Practice	3	3	0	6
Psychiatry	6	1	1	8
OB-GYN	1	2	3	6
Surgery	4	1	1	6
Pediatrics	2	3	3	8
	20	12	10	42

$$\chi^2 = 10.33, \text{N.S.}$$

one of three basic personality types empirically developed from these data.

A clinical interpretation of each of the profiles can be made as follows. Pattern 1 (containing 48% of the residents) appears to be a gratification oriented group on the basis of their high needs for sentience, understanding, change, desirability, and low needs for cognitive structure, order, defendance, and harmavoidance. Pattern 2 (containing 29% of the residents) appears as a control oriented group based on their high needs for abasement, cognitive structure, order succorance, and low needs for aggression, automony, change, and impulsivity. The third pattern (containing 23% of the residents) appears as a highly individualistic, "loner" group because of their high scores on aggression, autonomy, defendance, and low scores on nuturance, succorance, and desirability.

It is of interest to note the high degree of consistency between these empirically derived clusters and Jackson's theoretical prediction of an impulse expression dimension underlying the individual traits of impulsivity and change *vs* harmavoidance, order and cognitive structure (Jackson, 1974).

The three patterns were then analyzed to determine whether or not a specific medical specialty was over-represented in any one pattern. Table 8 represents how the various specialties distributed themselves among the personality clusters.

No patterns related to a medical specialty at a statistically significant level. However, there were definite trends, in that the psychiatry residents tended to display the gratification oriented pattern more than the other two, and OB-GYN residents tended to the loner pattern more than the other two.

Also tested was the relationship of sex and personality pattern. This was significant beyond the .01 level, with women over-represented in the loner pattern (50% of total women sample) and completely absent from the control oriented group. There was also significant difference on the peer ratings of excellence as a teacher; residents with the control oriented pattern show lower scores.

Generally speaking, PPDT characteristics associated with the three patterns were consistent with the descriptive interpretations offered above.

### SUMMARY AND CONCLUSIONS

The findings of this study indicated that medical faculty and young physicians agree about the psychological characteristics they regard as important in medical students, and that this consensus transcends the methodology used to elicit it. Persistence, discipline, dependability, psychological mindedness, and empathy, were clearly felt to be important by both groups. Unfortunately, the characteristics about which there is agreement do not appear related to excellence as a physician.

The study also demonstrated that young resident physicians can be divided into three personality patterns: gratification oriented, control oriented, and loners; however, there is no single constellation or pattern of traits that is associated with excellence as a physician. However, it also suggests that the patterns may be related to specialty choice, and are related to sex.

Finally, the study indicated that the single psychological characteristic of the need to understand, a characteristic reflecting curiosity, cognitive

complexity, and the need for intellectual control is clearly related to ratings of all types of physician excellence. Strikingly, in the range of accepted students this trait, need for understanding, was not related to MCAT scores, and was negatively related to GPA, adding to the well documented lack of relevance of these measures to clinical performance.

Obviously further research is required to extend the present findings beyond the school studies, and from the student and resident pool to the applicant pool. In addition, longitudinal studies are required to distinguish population shifts from educational and maturational changes. Finally, the relevance of a series of studies of self-image and career goals in women is also indicated.

The results underline the importance of empirical validation of subjective priorities in selection; the importance of considering psychological variables, in addition to MCAT scores and GPA scores, especially curiosity and cognitive complexity; and the importance of heterogeneity of personality types in medical school admissions.

#### NOTE

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