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AUTHOR Shaughnessy, Michael F.; And Others
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ABSTRACT

This study explored personality variables measured by the 16 Personality Factor (16PF) test and their relevance to success, as defined by the final course grade, in college calculus courses with 94 students. Two personality variables were significant predictors of success as determined by the final course grade. A Statistical Analysis System multiple regression procedure found Factor G of the test (conscientious, conforming, moralistic, staid, rule-bound) to be a significant predictor of success. Factor G can be considered a measure of persistence and perseverance. The relevance of Factor A was less clear, but it was statistically significant in the multiple regression. Three tables illustrate statistical findings. (Contains 7 references.) (SLD)

Scores on the 16 Personality Factor Test and Success in College Calculus 1

Michael F. Shaughnessy, Jody Stockard, Jack Moore
Eastern New Mexico University

Carole Siegel
Philadelphia College of Pharmacy and Science

1 Send requests for reprints to Dr. Shaughnessy, Eastern New Mexico University, Portales, New Mexico 88130

Running Head : Calculus

The present study explored personality variables measured by the 16 Personalty Factor (16PF)Test and relevant to success, as defined by final course grade, in college calculus courses with 94 students. Two factors were found ofimport in this exploratory study. Implications for teaching and future research are noted.

Certain specific personality variables are viewed as increasingly salient to academic success and to mathematical success in particular. Odom and Shaughnessy (1989) and Ham and Shaughnessy (1992) have indicated certain personality variables seem to contribute to success in mathematics and science, respectively. Keimowitz and Ansbacher (1960) utilized the California Personality Inventory to identify personality variables relevant to success in arithmetic. Feinberg and Halperin (1978) noted both affective and cognitive correlates of success in college statistics .

The present study administered the 16PF to a group of college students enrolled in calculus I, II and III, to identify personological variables which contribute to or predict success, as measured by final grade, in calculus courses.

Method: Pharmacy majors enrolled in Calculus I, II, and III served as subjects. There were 94 students-52 women (average age 18.9) and 42 men (average age 20.9). There were 75 students in Calculus I, 5 in Calculus II, and 14 in Calculus III.

The 16 PF, Form C, a questionnaire of 105 items was administered during class to assess 16 specific personality factors ; see table 1 below for the list.

The 16PF is a factor analytically designed and developed personality inventory designed to measure the major trait dimensions of human personality comprehensively from young adulthood (17 years to later maturity (30 years) (Cattell, Eber, & Tatsuoka, 1970)

Results. The means and standard deviations for the 16 factors are provided in Table 1.

----------Insert Table One About Here ----------

Two personality variables were significant predictor of success, as determined by final course grade (on a four point scale A=4, B=3, C=2, D=1 and F=0), in the calculus courses. A SAS multiple regression procedure adopting a exploratory liberal p. of .10 found Factor G (conscientious, conforming, moralistic, staid, rule-bound) was a signficant predictor of success in college calculus courses for this sample . Factor G suggests a high scorer is " exacting in character...persevering, responsible...usually conscientious ".(IPAT, 1991, p. 26)

In mathematics in general , and calculus in particular, one must have a good deal of patience and persistence to solve complex, intricate problems. Individuals without much patience and those having a low frustration tolerance would

have some trouble in higher order mathematics. These students would be more likely to drop out of classes or withdraw when difficulties arise.

The relevance of Factor A as a predictor variable is less clear, particularly with respect to calculus, although it is statistically significant in the multiple regression.

Siegel and Shaughnessy (1992) reported preliminary findings on the role of personality in calculus success. This study supported the earlier work including the idea that responsibility is a major factor in calculus and other mathematical topics. The persistence and perseverance (as indirectly measured by Factor G) characteristic of an individual may contribute substantially to success in calculus and perhaps in other numerical fields. Students lacking patience or having low frustration tolerance may be less able to deal with mathematically oriented courses. Developing conscientiousness may aid students performance. Researchers may want to include a measure of intelligence to clarify these preliminary or exploratory findings in the future.

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Description of 16PF Factors and Results of Testing

Factor	Capsule Description	Mean	S D
A	Aloof vs Warm, Outgoing	5.1	2.0
B	Less Intelligent vs More Intelligent	5.3	2.0
C	Emotional immaturity vs emotional maturity	4.7	2.0
E	Submissive, humble vs dominant, assertive	6.0	2.1
F	Glum, sober vs enthusiastic	5.6	1.8
G	Casual,expedient vs conscientious, responsible	5.3	1.7
H	Timid, shy vs adventurous, spontaneous	5.4	1.8
I	Tough minded, realistic vs sensitive	5.0	1.8
L	Trustful, adaptable vs suspicious self opinionated	6.1	1.8
M	Conventional,practical vs eccentric,imaginative	4.7	1.9
N	Simple, unsophisticated vs sophisticated	5.4	1.9
O	Confident,unanxious vs insecure, anxious	5.5	1.6
Q1	Conservative,cautious vs experimenting	5.7	1.7
Q2	Group dependent, follower vs self sufficient	5.6	1.8
Q3	Uncontrolled, weak willed vs self controlled	4.6	1.5
Q4	Stable, relaxed vs tense, restless	5.3	1.7

Forward Selection Procedure for Dependent Variable Y

Step 1 Variable A Entered $R^2 = 0.070$

	DF	SS	MS	F	p.
Regression	1	9.933	9.93	6.95	.01
Error	92	131.440	1.43		

Variable	Parameter Estimate	Standard Error	Type II S.S.	112.04	.0001
INTERCEPT	3.588	.339	160.07	6.95	.01

Step 2 Variable G Entered

Regression	2	14.28	7.14	5.11	.008
Error	91	127.09	1.40		
Total	93				

Variable

Intercept	2.993	.475	55.32	39.60	.0001
Factor A	-0.173	.061	11.04	7.90	.006
Factor G	0.121	.069	4.35	3.12	.08

No other variable met the .10 significance level for entry into the model.