

# Personality Predictors of Performance in an Introductory Computer Course

Michael G. Aamodt  
Department of Psychology  
University of Arkansas  
Fayetteville, AR 72701

The current study investigated the relationship between five individual difference measures and performance in an introductory computer course as compared to performance in an introductory psychology course. The results indicated that steadiness was related to computer exam performance whereas compliance and cognitive ability were related to psychology exam performance. No variables were able to predict performance on computer projects.

Whereas individual difference variables are thought to play an important role in computer programming, little research has been conducted that has actually investigated the contribution of personality factors to programmer performance (Shneiderman, 1980). Although a few studies have been conducted on personality characteristics of programmers, none has sought to make the link between personality style and programming effectiveness. Instead, these studies were content with descriptive information only; that is, describing individual difference parameters which distinguished programmers from the population in general.

In the first major investigation of the personality characteristics of computer programmers, Perry and Cannon (1967) sought to determine the vocational interests of programmers. Perry and Cannon (1967) administered the Strong Vocational Interest Blank (SVIB) to 1,378 computer programmers and discovered that programmers had a greater interest in problem solving, mathematics, and mechanical pursuits and a lesser interest in people than did other professional men. The interests of programmers were most similar to optometrists, chemists, engineers, managers, math teachers, and certified public accountants and least similar to veterinarians, secretaries, and salesmen. Although programmers' interests were similar to some of

the previously mentioned jobs, they were not close enough to warrant the use of one of the existing SVIB job keys. Therefore, the authors developed a programmer key which did an excellent job of discriminating programmers from men in general.

A follow-up study (Perry & Cannon, 1968) found that the interests of 293 female programmers were quite similar to those of male programmers. The greatest difference occurred in the aesthetic and scientific fields where female interests were higher and in the technical and technical-supervision occupations where female interests were lower. As a result of these findings, a female computer programmer key was constructed to augment the original male programmer key.

The findings of Perry and Cannon (1967) have been supported in subsequent research. Couger and Zawacil (1978) surveyed over 600 programmers and analysts and concluded that data processing professionals have a negligible need for social interaction and an extremely high need for personal growth. Similar results were obtained by Fitz-enz (1978) when he had programmers rate Herzberg's job factors and found that achievement and growth were rated as being very important whereas salary and status concerns were rated as not being very important.

Although the four studies mentioned previously have certainly added to our understanding of the computer programmer, they do not provide a basis for understanding the personality characteristics which are the most important for programming performance. One study that attempted to bridge this gap sought to predict the training performance of the computer novice. In this attempt to predict grades in an introductory computer class (Newsted, 1975), it was found that the personality dimensions of aggressive/humble and introversion/extroversion did not predict course performance.

It is the purpose of the present study to examine the relationship of selected personality variables to performance in an introductory computer course. It was predicted that the personality attributes of intelligence, patience, and ability to concentrate on detail will lead to high course performance and that the predictors of computer course performance would differ from predictors of psychology course performance.

The personality inventories selected to test these hypotheses were the Wonderlic Personnel Test and the Personal Profile System. The Wonderlic is a test of cognitive ability that had extensive use in industry. The Wonderlic consists of 50 questions that test an individual's verbal, mathematical, and logical abilities. The individual is allowed 12 minutes to answer as many questions as possible. The test manual provides extensive norms and previous research has shown that Wonderlic IQs correlate .93 with WAIS full-scale IQs (Dodrill, 1981) and that Wonderlic scores correlate highly with grades in a psychology course (Aamodt, 1982).

The Personal Profile System was developed out of the early work of Marsten (1928) and provides scores on four separate dimensions. The dimensions and their definitions are:

Dominance (D) – Obtains immediate results, makes quick decisions, takes authority, solves problems, and causes trouble.

Influence (I) – Creates a motivational environment, generates enthusiasm, helps others, and makes a favorable impression.

Steadiness (S) – Has patience, concentrates on the task, calms excited people, and identifies with the group.

Compliance (C) – Concentrates on detail, checks for accuracy, criticizes performance, complies with authority, and thinks critically (Geier, 1979)

Research on the Personal Profile System has shown that it contains a moderate degree of reliability (Aamodt, Keller, Neufeldt, & Kimbrough, Note 1), has high convergent validity (Aamodt, Kimbrough, Keller, & Neufeldt, Note 2), and has high profile interpretation acceptance (Aamodt & Kimbrough, Note 3). The predictions of team building outcomes based on the Personal Profile System interpretations have been supported by Meskin (1974) and Aamodt and Kimbrough (1982). Thus, it appears that both the Wonderlic and the Personal Profile System can be used with confidence.

## METHOD

Subjects. The participants in the experiment were 55 University of Arkansas students. Twenty-five of the students were enrolled in an introductory computer course and 30 were enrolled in an introductory psychology course. As indicated in Table 1, the norms of the predictor variables were similar for both samples.

Procedure. Participants were administered the Wonderlic Personnel Test and the Personal Profile System in a classroom setting toward the end of the fall semester. The instructions given to the students were those listed in the test manuals. Subjects were debriefed following the test administration.

Grades were collected for each participant. The psychology grade represents the total points obtained from six essay tests worth 25 points each. Three separate point totals were obtained for the computer students. The first total represents the scores on two exams. The second total represents the scores on assigned computer projects, and the third total represents the total number of points obtained in the course.

The scores on the Wonderlic and on the four Personal Profile System scales were then entered into a regression equation to predict the four sets of scores described previously.

## RESULTS

The data were entered into a stepwise regression equation using the stepwise procedure of the Statistical Analysis System (Barr, Goodnight, Sall, & Helwig, 1978). Only variables with a significance level of .10 were allowed to enter the equation. As indicated by the correlations shown in Tables 2-3 and the regression analysis in Table 4, the only predictors of the psychology course grade were the intelligence measure and the compliance scales of the Personal Profile System and only predictor of the test scores and overall course performance in the computer course was the steadiness scale of the Personal Profile System.

No variables met the .10 significance level for entry into the equation to predict the points obtained on the computer projects. The regression equations account for 29% of the variance of the psychology exams, 21% of the variance for the computer course exams, and 20% of the variance for the overall computer course grade. Quadratic models did not increase the effectiveness of any of the equations.

## DISCUSSION

The results indicate that different personality variables account for performance on psychology exams than account for performance on computer exams. Thus, performance on psychology exams is related to the intelligence

and critical thinking of the student whereas performance on the computer exams is related to the ability of the student to be patient and to concentrate on the task. These results may be interpreted to mean that a student's intelligence (as perhaps measured through course grades) should not be used as a basis for selecting an individual for computer training. Instead, ability to concentrate on the task and patience are more important.

The finding that none of the variables predicted performance on the computer projects is surprising. One possible reason is that the average grade on the projects was a middle B. Thus, the projects may have been too easy for personality factors to play an important role. Another possible explanation involves the sample that was used. Because the data were collected toward the end of the semester, it is possible that the poor students had already dropped the course. Thus, the students who remained may have been a high quality group with little variance in ability. One final explanation for the inability of the measures to predict performance on the computer projects is that the dependent measure was not sensitive enough to measure any real individual differences. Perhaps a better measure would be the number of computer runs necessary to complete the program.

It is this last explanation that seems to provide a focus for future research. It could be that with beginning-level programs and programmers, it is the process of completing the program rather than the final program itself that is most important. Likewise, with more advanced programs and programmers, the end may be more important than the means. Further research on the interaction between personality variables and program type is needed to clarify the results of the present study.

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**Table 1**

Means and Comparison Tests for Experiment Samples					
Variable	Sample	X	SD	N	t value
Dominance	Computer	.52	6.38	25	1.17, ns
	Psychology	-1.30	5.12	30	
Influence	Computer	.76	4.13	25	1.25, ns
	Psychology	2.27	4.76	30	
Steadiness	Computer	1.44		25	0.08, ns
	Psychology	1.33		30	
Compliance	Computer	-3.12		25	0.62, ns
	Psychology	-2.33		30	
Intelligence	Computer	22.28		25	0.50, ns
	Psychology	22.83		30	

**Table 2****Correlations Among Variables for the Computer Sample**

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Dominance	1.00	.18	-.74	-.60	-.13	-.32	.02
2. Influence		1.00	-.53	-.61	-.17	-.34	-.07
3. Steadiness			1.00	.44	.41	.46	.01
4. Compliance				1.00	.00	.25	-.16
5. Intelligence					1.00	.36	.07
6. Exam scores						1.00	.22
7. Project scores							1.00

Note: Coefficients above .39 are significant at the .05 level.

**Table 3****Correlations Among Variables for the Psychology Sample**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
1. Dominance	1.00	.05	-.75	-.31	.06	-.14
2. Influence		1.00	-.33	-.77	.27	-.10
3. Steadiness			1.00	.34	-.11	.03
4. Compliance				1.00	-.19	.24
5. Intelligence					1.00	.35
6. Exam scores						1.00

Note: Coefficients above .34 are significant at the .05 level.

**Table 4****Regression Equations**

Dependent Measures	Intercept	Predictor	Beta	Model F Value	<i>p</i> <
Computer exams	220.87	Steadiness	3.40	6.32	.02
Overall computer grade	327.92	Steadiness	3.58	4.68	.05
Psychology exams	77.39	Compliance	1.58	4.12	.03
		Intelligence	1.87	1.00	

Notes:

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2. Requests for reprints should be sent to Michael G. Aamodt, Department of Psychology, University of Arkansas, Fayetteville, AR 72701