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The purpose of this investigation was to determine whether there were identifiable characteristics that distinguish male students who change their academic goals during their first year in college from those who persist. The subjects were 244 students, half of whom were science students, and half humanities students, with half of each group changing, and half persisting. The Omnibus Personality Inventory (OPI), an Intellectual Activities Check List, and a questionnaire were used to gather raw data which was treated statistically with analysis of variance and Chi-square procedures. Clear differences between persisters and changers were noted in science students, with changers higher in flexibility, independence, tolerance of ambiguity, and general receptiveness. In humanities students, however, the differences between persisters and changers were in the opposite direction. Interaction effects and attitude differences are discussed as contributory to these findings. (BP)

Curricular Changers and Persisters: How Do they Differ?

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Several theories of vocational choice suggest the choice process is related to personality development (Roe, 1956;Super, 1953) and that vocational interests reflect personality characteristics (Tiedeman, 1952; Holland, 1966). Studies of the relationship between personality characteristics and vocational choice indicate that college students with different vocational goals have distinct attitudes and personalities (Bereiter & Freedman, 1962). Different fields of study appear to attract different kinds of students so that when freshmen are classified by prospective fields of study, they have been found to differ significantly in personality and values (Warnath & Fordyce, 1961).

Some research attention has been given to the student who changes his academic-vocational goal. Holland (1962) and Cole, Wilson & Tiedeman, (1964) report that most changes are related to academic fields. Thistlethwaite (1960) examined factors influencing talented students to change and Elton and Rose (1966, 1967) examined within-university changes for arts and science women, and men in engineering. Few studies have examined the phenomenon of persistence and change across several fields by comparing students prior to and after the change.

The purpose of this investigation was to determine whether there were identifiable characteristics that distinguish male students who change their academic goals during their first year of college from those who persist. Are they different in some ways before they begin their college career? Are curricular changes isolated events or are they accompanied by changes in attitudes and personality? The focus was on two curricular groups, Science and Humanities students.

Description of Sample

The initial pool of subjects consisted of male Science and Humanities college freshmen enrolled in an arts and science college who indicated they were certain of their academic aspirations and vocational goal at the beginning of their freshman year. Only those indicating they planned to return to college and those who had a 'C' average or better were sampled. There were no differences in ability or in first year point average.

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Science students were in biology, chemistry, math and physics programs with actual enrollment in at least two such courses, whereas Humanities students were enrolled in art, history, literature, music or philosophy programs. They were also classified as Persisters and Changers depending upon their persistence in their curriculum. Persisters were students who planned to stay in the same curriculum and Changers were those who at the end of the year planned to change to an unrelated academic program.

Complete data was available for 305 students, 82 of whom were Persisters in Humanities programs. To facilitate analysis an equal number, 61, were randomly selected from each of the four categories. This resulted in the final sample consisting of 244 students, 122 Science and 122 Humanities, with half of each curricular group being Persisters and half Changers.

Instruments and Analysis

Criteria included personality and attitude characteristics, degree of participation in a variety of intellectual activities, friendship patterns and satisfaction with courses and college. The Omnibus Personality Inventory, Form D, (OPI, 1962) served as the measure of both personality and attitude characteristics, an Intellectual Activities Check List and a questionnaire were employed to obtain the other information. Except for the sociometric and satisfaction data, all measures were obtained both at the beginning and end of the academic year.

Two-factor analysis of variance, which permitted testing the interaction effect of change and curriculum, as well as the main effects was used for analysis of the beginning of the year measures. Analysis of covariance adapted for a two-factor design with initial measures serving as co-variates was used to examine end of the year differences. When observed interaction effects were significant, appropriate tests of the differences within each level were made, employing the overall mean square as the error term. Chi-square analysis was employed for treatment of data on friendship patterns, satisfaction, and on viewpoints on the purpose of a college education.

Results

Beginning of the Year Comparisons

The results of the analyses of variance of the beginning of the year measures are reported in Table 1. There were a number of significant differences between the students in different curriculums and between Persisters and Changers within particular curriculums, but none between Persisters and Changers as intact groups. The means are reported in Table 2.

Between Science and Humanities Students

The initial differences between Science and Humanities students in attitudes and activities were consistent with those that might be expected from previous studies. When compared to Humanities students, the Science majors were more logical, rational and critical in their approach to problems (high TO), less interested in art, literature and drama (low ES),

more masculine and less anxious (high MF),and more concerned about making a good impression (high RB). On the Intellectual Activities Check List, the Science students indicated that they had participated in a significantly greater variety of science activities but fewer humanities activities during their last year of high school than had the Humanities students. There were no significant differences between Science and Humanities students in their views of the purpose of a college education.

Between Persisters and Changers

There were no initial differences between Persisters and Changers as such, but there were significant interaction effects between curriculum and persistence on several criteria.

At the beginning of the academic year, Science Changers were more tolerant of ambiguities and uncertainties and more aware of subtle variations in their environment (high CO) than were Science Persisters. For the Humanities students, the opposite pattern appeared with the Persisters being more flexible than the Changers. Science Changers were also generally more ready to express their impulses and seek gratification for them (high IE) than were those persisting in their science aspirations. The Humanities Persisters, on the other hand, were more impulsive than the Changers. In both instances, the differences between the Science Persisters and Changers alone were significant, but not for the Humanities students alone.

Though the differences at each level alone were not significant, there were significant observed interactions on the Religious Liberalism scale. The Science Changers were more tolerant of various religious viewpoints (high RL) than were Science Persisters. For the Humanities students the difference was in the opposite direction with Persisters more tolerant than the Changers.

There were no significant differences in liking reflective thought (TI), in autonomy (AU), or on more direct personality measures, such as social alienation (SF), social introversion (SI) and anxiety (LA).

In their viewpoints on the purpose of a college education Science Persisters rated vocational training significantly higher than did Science Changers. Humanities Changers rated vocational training higher than did Humanities Persisters, but the difference was not significant.

End of the Year Comparisons

Between Science and Humanities Students

The analyses of variance for the end of the year measures are summarized in Table 3 with the unadjusted means presented in Table 4. Again, there were several significant differences between Science and Humanities students. At the end of the year, Science students showed a greater degree of interest in using scientific methods in thinking and were more logical and rational (high TO) than were the Humanities students. They were also more masculine (high MF), but were less tolerant of different religious viewpoints (low RL).

Between Persisters and Changers

Several significant interactions indicated that the Science Changers were more independent (high AU), more flexible (high CO), and more impulsive (high IE) than Science Persisters. The differences on the CO and IE scales for the Science students alone were significant. Humanities Changers were less flexible and independent, but the differences at this level alone were not significant.

Chi-square analysis of questionnaire data revealed a number of significant differences between Persisters and Changers within particular curriculums. Science Persisters had engaged in more extra-class science activities during the academis year than had Science Changers. There were no differences between the Humanities groups nor were there differences between any of the groups in amount of participation in humanities activities.

Science Changers rated the general educational values of a college education higher than did Science Persisters and Humanities Persisters rated the same values higher than Humanities Changers. In both instances, the differences were significant.

There were no differences between the groups in how they rated their satisfaction with either their courses or their general college experience. Science Persisters, however, were more satisfied with their course instructors than were Science Changers.

The friendship patterns varied, as indicated by chi-square analysis of number of best friends who were enrolled in the same or different curriculum category. Science Persisters had significantly more best friends who were science majors than did Science Changers. The pattern was reverse for the Humanities students, with Changers having more science best friends than Persisters, but the difference for this level alone was not significant. The same pattern appeared in the analysis of number of best friends who were Humanities majors. Humanities Persisters had more Humanities best friends than did Humanities Changers, while Science Changers had more Humanities friends than did Science Persisters. Again, the difference for the Science students alone was significant, but not for the Humanities students alone.

Gain Measures

Initial measures obtained on the attitude and personality scales were used as control variables in analysis of covariance of the end of the year measures. A full discussion of this procedure to measure gain can be found in Thistelthwaite (1968). Two critical assumptions necessary for employment of analysis of covariance are homogeneity of regression and linearity of regression. These two assumptions were tested by procedures outlined in Winer (1962) and in all instances proved tenable. The analyses of covariance are summarized in Table 5 and the adjusted means are presented in Table 4.

Between Science and Humanities Students

Using initial measures as the control variables, the analysis of covariance resulted in significant differences on several scales. As a group, the Humanities students were more open and flexible (high CO), more liberal in their religious views (high RL), and less masculine (low MF).

Between Persisters and Changers

Changers differed significantly from Persisters in their readiness to express impulses (high IE). They valued sensations more highly, had a more active imagination and were more dominated by their feelings, as indicated by this scale, than were the Persisters.

Chi-square analysis of questionnaire data noting whether ratings of individual students within groups went up, stayed the same or went down was made on views of the purpose of a college education and on participation in intellectual activities. This analysis indicated that more Science Persisters rated vocational training as less important than they had initially than did Science Changers. There were no other significant directional differences in activities or goals.

Discussion

These results suggest that it is possible to generalize about some characteristics of curricular changers and persisters within science and humanities curriculums, but that it is more difficult to generalize about changers and persisters across academic fields. A good number of significant differences were apparent between persisters and changers within the science curriculum in particular, but most of the differences within the humanities curriculum were in a different direction, thus negating the possibility of overall differences between persisters and changers. Persistence or change did not appear to be associated with particular attitudinal patterns of personality traits.

The relatively few differences between persisters and changers is consistent with the findings of recent studies of the students with inconsistent career preferences (Osipow & Gold, 1967) and undecided students (Baird, 1969). However, when comparisons between changers and persisters within specific curriculums were made (Elton and Rose, 1967) clear differences began to appear.

When Science Persisters and Changers were compared there were significant differences even before they started their college career. For the students sampled in this study, the differences were not in certainty, ability or in the variety of science activities they had previously pursued. The initial attitudinal and personality differences in tolerance of ambiguities, impulsiveness and religious liberalism favoring the Science Changers could be summed up by characterizing them as receptive. They appeared to be more flexible, experimental and curious. The same pattern appeared when the end of the year measures were compared, in addition to the Science Changers being more independent.

Curriculum change cannot be attributed to this receptivity alone, however, or it would be expected that Humanities Changers would exhibit the same characteristics. The finding that the differences for the Humanities students were in the opposite direction, resulting in a number of significant interaction effects, suggests that change could be associated with the interaction of this receptivity and flexibility with the curriculum and factors associated with it. These findings cannot be interpreted causally, but it is noteworthy that change and persistence were associated with feelings about professors, friendship patterns and participation in intellectual activities.

Though differences between Persisters and Changers within the curriculums were most marked initially, there were differences at the end of the year in several attitude and personality areas. Curriculum change did not appear to be an isolated event which simply involved finding the proper vocational niche. Rather the process for these students seemed to be one that was developmental as well as one of differentiation.

As further research efforts offer refinements of our understanding of the student who changes his curricular goal, attempts can be made to identify potential changers and assess the impact of various intervention techniques. Would the highly flexible and autonomous science student persist if curricular adaptations were possible or more opportunities to share ideas with professors were an essential part of the program? Would this science student persist if he was aware that his science professor was also interested in art and literature?

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Table 1

ANALYSIS OF VARIANCE OF INITIAL MEASURES

ON THE OMNIBUS PERSONALITY INVENTORY SCALES

Scale		Curriculum	Persistence	Interaction	Within
Theoretical Orientation	df	1	1	1	240
	MS	573.26	1.33	2.77	19.82
	F	28.92**	.07	.14	
Thinking Introversion	df	1	1	1	240
	MS	1.98	138.75	150.24	80.47
	F	.02	1.72	1.87	
Estheticism	df	1	1	1	240
	MS	118.44	1.64	55.15	21.81
	F	5.43*	.08	2.53	
Complexity	df	1	1	1	240
	MS	18.95	39.36	154.24	19.60
	F	.97	2.01	7.87**	
Autonomy	df	1	1	1	240
	MS	.41	.07	135.75	35.86
	F	.01	.00	3.79	
Religious Liberalism	df	1	1	1	240
	MS	3.69	14.75	53.26	12.38
	F	.30	1.19	4.30*	
Impulse Expression	df	1	1	1	240
	MS	.59	289.98	757.79	123.71
	F	.00	2.34	6.12*	
Social Introversion	df	1	1	1	240
	MS	155.84	1.48	2.99	85.84
	F	1.82	.02	.03	
Schizoid Functioning	df	1	1	1	240
	MS	236.06	80.33	424.93	187.91
	F	1.26	.43	2.26	
Masculinity Femininity	df	1	1	1	240
	MS	432.89	52.33	11.51	25.56
	F	16.94	2.05	.45	
Lack of Anxiety	df	1	1	1	240
	MS	6.56	2.36	1.98	23.51
	F	.28	.10	.08	
Response Bias	df	1	1	1	240
	MF	126.95	11.95	33.20	19.45
	F	6.53*	.61	1.71	

* p<.05
**p<.01

Table 2

INITIAL MEANS ON THE OMNIBUS PERSONALITY INVENTORY SCALES

Scale	Science Persisters	Science Changers	Humanities Persisters	Humanities Changers
Theoretical Orientation (TO)	18.26	18.18	15.42	15.78
Thinking Introversion (TI)	32.15	31.70	33.39	30.16
Estheticism (ES)	8.66	9.44	11.00	9.88
Complexity (CO)	10.13	12.53	11.17	10.37
Autonomy (AU)	19.51	20.97	20.91	19.39
Religious Liberalism (RL)	7.34	8.83	8.03	7.59
Impulse Expression (IE)	32.10	37.80	35.52	34.18
Social Introversion (SI)	22.31	21.93	20.49	20.57
Schizoid Functioning (SF)	32.26	36.05	32.93	31.44
Masculinity-Femininity (MF)	29.24	29.74	26.16	27.50
Lack of Anxiety (LA)	11.84	11.84	11.32	11.72
Response Bias (RB)	14.40	13.23	12.23	12.52

Table 3

ANALYSIS OF VARIANCE OF END OF YEAR

MEASURES ON THE OMNIBUS PERSONALITY INVENTORY SCALES

Scale		Curriculum	Persistence	Interaction	Within
Theoretical Orientation	df	1	1	1	240
	MS	411.84	20.66	3.45	20.93
	F	19.68**	.99	.16	
Thinking Introversion	df	1	1	1	240
	MS	42.64	10.24	325.92	87.49
	F	.49	.12	3.72	
Estheticism	df	1	1	1	240
	MS	78.05	30.31	39.36	24.43
	F	3.19	1.24	1.61	
Complexity	df	1	1	1	240
	MS	40.17	76.92	185.94	21.43
	F	1.88	3.60	8.71**	
Autonomy	df	1	1	1	240
	MS	.04	.92	134.27	34.81
	F	.00	.03	3.86*	
Religious Liberalism	df	1	1	1	240
	MS	61.00	12.85	20.08	15.84
	F	3.85*	.81	1.27	
Impulse Expression	df	1	1	1	240
	MS	13.32	645.94	582.50	107.55
	F	.12	6.00*	5.42*	
Social Introversion	df	1	1	1	240
	MS	83.81	12.40	106.23	72.30
	F	1.16	.17	1.47	
Schizoid Functioning	df	1	1	1	240
	MS	66.10	270.69	54.20	181.71
	F	.36	1.49	.30	
Masculinity-Femininity	df	1	1	1	240
	MS	610.64	4.20	20.88	27.45
	F	20.24**	.15	.76	
Lack of Anxiety	df	1	1	1	240
	MS	18.95	6.56	.06	22.87
	F	.83	.29	.00	
Response Bias	df	1	1	1	240
	MS	93.45	16.27	31.02	17.04
	F	5.48*	.95	1.82	

* $p<.05$
** $p<.01$

Table 4

END OF THE YEAR (Y) AND ADJUSTED (Y')

MEANS ON THE OMNIBUS PERSONALITY INVENTORY SCALES

Scale	Science Persisters		Science Changers		Humanities Persisters		Humanities Changes	
	Y	Y'	Y	Y'	Y	Y'	Y	Y'
Theoretical Orientation(TO)	16.90	16.06	17.72	16.66	14.54	15.47	14.89	15.85
Thinking Introversion(TI)	28.92	28.82	31.64	31.87	32.07	31.07	30.16	31.03
Estheticism(ES)	8.69	9.48	10.20	10.42	10.62	9.71	10.52	10.42
Complexity(CO)	9.52	10.12	12.39	11.44	12.08	12.01	11.46	11.89
Autonomy(AU)	21.33	21.15	22.93	22.46	22.84	22.39	21.48	21.97
Religious Liberalism(RL)	9.56	9.91	10.59	10.10	11.13	11.07	11.02	11.22
Impulse Expression(IE)	33.23	35.07	39.57	37.67	36.79	36.38	37.95	38.43
Social Introversion(SI)	24.13	23.52	22.36	21.98	21.64	22.15	22.51	22.98
Schizoid Functioning(SF)	27.22	28.36	30.82	28.97	29.75	29.91	30.92	32.03
Masculinity-Femininity(MF)	29.85	29.22	29.02	28.10	26.11	27.29	26.43	26.81
Lack of Anxiety(LA)	12.64	12.55	12.28	12.18	12.05	12.26	11.75	11.74
Response Bias(RB)	14.74	14.02	13.51	13.44	12.79	13.26	12.98	13.30

Table 5

ANALYSIS OF COVARIANCE OF OMNIBUS PERSONALITY INVENTORY SCALES

Scale		Curriculum	Persistence	Interaction	Within
Theoretical Orientation	df	1	1	1	239
	MS	26.80	14.68	.68	13.40
	F	2.00	1.10	.05	
Thinking Introversion	df	1	1	1	239
	MS	30.32	137.28	143.65	45.20
	F	.67	3.04	3.18	
Estheticism	df	1	1	1	239
	MS	.81	41.43	.74	12.92
	F	.06	3.21	.06	
Complexity	df	1	1	1	239
	MS	83.60	21.92	30.15	13.15
	F	6.36*	1.67	2.29	
Autonomy	df	1	1	1	239
	MS	.34	1.25	19.11	21.28
	F	.02	.06	.90	
Religious Liberalism	df	1	1	1	239
	MS	79.87	1.74	.03	11.59
	F	6.89**	.15	.00	
Impulse Expression	df	1	1	1	239
	MS	17.26	216.17	35.49	54.28
	F	.32	3.98*	.65	
Social Introversion	df	1	1	1	239
	MS	2.07	7.67	85.36	39.72
	F	.05	.19	2.15	
Schizoid Functioning	df	1	1	1	239
	MS	322.44	114.14	34.31	104.54
	F	3.08	1.09	.33	
Masculinity-Femininity	df	1	1	1	239
	MS	147.46	39.00	6.24	18.81
	F	7.94	2.07	.33	
Lack of Anxiety	df	1	1	1	239
	MS	8.12	11.98	.32	14.85
	F	.55	.81	.02	
Response Bias	df	1	1	1	239
	MS	12.00	4.59	5.82	11.28
	F	1.06	.41	.52	

* $p < .05$
* $p < .01$