

An Input-Output Analysis of the Achievement Levels of Secondary Schools in Dominica

Dr Kay Polydore

SECTION ONE: THE PROBLEM AND ITS SETTING

INTRODUCTION

This investigation has been undertaken in order to examine the relationship between the inputs and outputs of the secondary schools in Dominica, with a view to identifying factors which are associated with attainment in these schools

THE PROBLEM

In Dominica, as in several developing countries, there is a high level of wastage of talent at the secondary level, judging from the number of repeaters and drop-outs in the system. According to *A Statistical Study of Wastage at School*, prepared by UNESCO (1972):

"The number of pupils in a cohort who complete a given educational cycle is generally accepted as a measure of its output.... In this context, a drop-out is wasteful,... Similarly, repetition is regarded as wasteful since repeaters reduce the intake capacity of the grade in which they repeat (p. 15)."

In addition to the large number of repeaters, the low productivity of the schools on the whole and the very low pass rate of certain schools in particular in the external examinations, have given cause for concern, not only at the individual level but also on the national plane. Productivity is determined by the percentage of students obtaining 4 G.C.E. or 4 CXC passes at one sitting. Table 1:5 gives the percentage of students obtaining Grades A to C in the G.C.E. "Ordinary" level and General Proficiency Grades I and II at the CXC examinations over a 7-year period.

The fairly low pass rate depicted in Table 1:5 represents a very small rate of return on Government's investment in secondary education, since the G.C.E. Cambridge and CXC General Proficiency examinations are meant for the top 20 percent of the age cohort, and it is precisely this top 20 percent which enters the secondary schools in Dominica.

This under-achievement may be due to a host of factors which have been identified in previous investigations, although not conducted in Dominica. In various other investigations conducted in the developed countries of the world, school variables have been shown to affect attainment to a far less extent than home variables, possibly because in such countries, the standards of the schools and teachers meet certain basic criteria. In Dominica, on the other hand, there are glaring disparities between the secondary schools in terms of their ability intake, physical facilities and resources, teacher quality, social class composition of the student body, and various constraints imposed by their physical environments and the authority managing them.

It is anticipated that the results of this investigation will provide insights into the possible causes of the high failure rate in the secondary schools, and will therefore contribute to the enhancement of both the quality and quantity of secondary education in Dominica.

Table 1:5 — Schools’ Performance in G.C.E. and CXC Examinations (Percentage Passes)

Year	1981		1982		1983		1984		1985		1986		1987	
Schools	G.C.E.	CXC	G.C.E.	CXC	G.C.E.	CXC	G.C.E.	CXC	G.C.E.	CXC	G.C.E.	CXC	G.C.E.	CXC
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
A	45.0	62.5	48.1	54.5	48.0	59.0	35.3	63.5	33.5	61.0	55.3	74.8	59.8	61.7
B	54.4	-	71.2	-	73.0	49.0	77.9	83.0	64.0	51.0	54.3	47.3	73.5	48.0
C	25.0	33.0	61.6	19.0	27.5	19.0	19.0	15.0	20.5	24.0	41.6	30.4	-	18.0
D	45.0	-	43.1	-	34.7	75.0	50.0	51.0	57.0	50.0	28.5	51.5	-	59.0

E	36.8	21.1	37.6	47.8	32.9	39.0	45.4	55.0	-	49.0	-	46.1	-	40.0
F	33.3	-	19.7	-	29.0	10.0	14.4	8.0	36.0	25.0	38.0	33.3	59.4	37.0
G	-	-	-	-	-	-	-	-	36.0	43.0	-	20.4	-	20.0
H	19.7	-	17.4	-	33.0	-	30.1	-	22.5	33.0	-	39.4	-	32.0
Country	37.0	38.8	42.6	40.4	39.7	41.8	38.8	45.9	38.5	42.0	43.5	42.9	64.2	39.4

(N.B. Blanks are the result of the following:-

- the date at which the schools started or stopped taking particular external examinations; and
- the failure to obtain Grades I and II at CXC General Proficiency Level.)

SECTION TWO: REVIEW OF THE LITERATURE

In this section research on the factors influencing school achievement is reviewed.

In order to identify the factors which are associated with achievement, the results of a number of reviews and large-scale investigations mounted in both developed and developing countries will be outlined. In the United States the *Equal Educational Opportunity* (E.E.O.) survey, undertaken by Coleman et al. (1966), was one of the first major input-output analyses in education. Among the variables were school-related characteristics, community-related variables and teacher attributes. Their results demonstrated that students' family, peers and general social milieu influenced learning much more than did the school. As this finding was contrary to normal educational beliefs, the report caused much controversy and was criticized on a number of methodological grounds.

The publication of the findings of the Coleman Report generated much research on the identification of the determinants of school outputs, and by way of consolidation, Glasman and Biniaminov (1981) reviewed the numerous input-output analyses of schools. They arrived at the following conclusion:

"some of the studies constituted evidence of causality. Examples are as follows: student characteristics, family size (negatively), father's education, and student sex (female) (positively) affect verbal achievement indirectly through student attitudes... As to school conditions, teacher turnover affects negatively, and indirectly through student attitudes, the student verbal achievement" (p. 536).

In the United Kingdom, Kerchoff (1980) drawing on the longitudinal data of a national sample of British children, found that attending one of the more elite forms of secondary schools (grammar, technical or private) was associated with higher levels of attainment, even with ability held constant. Attainment in that study was construed as passes in a number of G.C.E. "Ordinary" of "Advanced" level examinations. Similarly, Madaus et al.'s (1979) findings provided evidence that differences in school characteristics do contribute to differences in achievement, and that examinations geared to the curricula of schools provide a more sensitive indication of school performance than do conventional norm-referenced standardized tests.

With regard to the developing countries, Heyneman and Loxley (1983) have observed that paradigms developed in conjunction with the Coleman Report and other surveys in industrialized countries, appear to have very different results when applied internationally. Since the level of expenditure on education in developing countries is less than in the developed countries, it might be expected that this could have a significant impact on achievement. Fuller (1987) in his review of related research, noted that in developing countries, simple inputs, especially those central to instructional processes, are consistently associated with higher attainment; and qualities of Third World teachers are related to achievement, particularly the number of years of tertiary education and teacher training.

While studies mounted in the developing countries seem to emphasize that school characteristics do make a difference, there are some that point to the greater influence of home background factors.

Schiefelbein and Simmons (1981) in their review based on 25 studies in developing countries, stressed that among the 123 statistically significant determinants of school achievement, variables related to student characteristics seemed to provide more consistent results than either teacher or school characteristics. Conte's (1980) findings offer further support for the predominance of the home environment variables over those of the school.

It is fitting to close this section by referring to an observation made by Alexander and Simmons (1975) in their extensive review of work in both developed and developing countries:

"The consensus of findings from both developed and developing countries is that the student's socio-economic background is the major determinant of his academic achievement throughout all levels of schooling except the upper secondary grades. Its contribution is smaller in the developing countries, while the contribution of some schooling variables to achievement is larger in the developing countries in several subjects like science. However, the impact of those schooling variables which are subject to policy control...is generally insignificant in the upper secondary grades." (p. i)

Owing to such factors as the measurement of achievement selected in the various studies, the level of data aggregation and the type of statistical techniques utilized, the results may seem contradictory as to which variables most strongly influence achievement. However, the studies reviewed here have provided some pointers in respect of the variables which must receive some attention in the present investigation.

SECTION THREE: THE RESEARCH DESIGN

In this section the instrumentation, sample and statistical analyses are described.

THE SURVEY

From the review of the literature a number of variables associated with attainment were identified for use in this exercise.

Students' Questionnaire

This purported to ascertain both biodata and some purely descriptive information as well as students' performance on a number of psychological measures.

1. Students' Family Background Characteristics

Variable 1. Parents' Education (ParEd)

Item 1 of Section II of the Students' Questionnaire was included to elicit information on this variable. Ratings were then assigned to the level of education of both parents, and the highest was selected as measuring the variable.

Variable 2. Parents' Occupation (ParOc)

A listing of parents' occupations was compiled for the entire sample and scored along the lines suggested in Miller's (1971) **Occupational Coding Scheme** for Jamaica. A group of top civil servants was asked to assist in examining the relevance of this scheme to the Dominican situation. It was ascertained that this could be used for Dominica, though a few jobs had to be shifted from level 3 (Highly Skilled) to level 4 (Skilled).

Variable 3. Family Background Characteristics (FamBkCh)

This scale was intended to measure the intellectual atmosphere of the home, the support and the encouragement given by parents, their aspirations for their children, the language spoken in the home, and the emphasis given to education as a whole.

2. Students' Personality Characteristics

Variable 4. Study Habits (StdHabs)

This variable was measured by an adaptation of the Survey of **Study Habits and Attitudes** instrument by Brown and Holtzman (1967).

Variable 5. Locus of Control (Loccon)

The Locus of Control Scale (Sinanan, 1983) — taps three separate dimensions:

- a. Personal Control
- b. General Control
- c. Systems Control

Personal Control refers to the degree to which a person believes he has control over his own life or is controlled by external events.

General Control addresses the degree to which one believes that people in general can control the events in their lives or are controlled by external forces; and Systems Control deals with one's perception of whether some major features in society can be controlled.

Variable 6. Achievement Motivation (AchMo)

This variable was measured by the Achievement Orientation subscale labelled "Desire to Excel", developed by Herrenkohl (1971). It requires the respondent to indicate his opinion and feelings about success and failure and his willingness to compete for status.

Variable 7. Academic Self-concept (AcaSeCon)

The **Academic Self-Concept Scale (Ragbir, 1975)** requires the respondent to assess his own ability and industriousness as

1. an individual
2. a member of his form or stream; and
3. a member of the entire group of fifth form students.

Variable 8. Extraversion (EXTRA)

Variable 9. Neuroticism (NEURO)

These were both measured by the **Eysenck Personality Inventory**. Eysenck has described typical extraverts and introverts as follows:

"The typical extrovert is sociable, likes parties, has many friends, needs to have people to talk to, and does not like studying by himself...The typical introvert, on the other hand, is a quiet, retiring sort of person, introspective, fond of books rather than of people; he is reserved and distant except with intimate friends." (pp. 59-60)

The items used by Eysenck (1965) to measure neuroticism suggest that it is characterized by unnecessary worrying, by feelings of restlessness, moodiness, and by general nervousness.

3. Students' Cognitive Dimension

Variable 10. Common Entrance Score (CoEnSc)

It was established in Chapter One that schools differ in the ability intake of their students. Therefore, one way to take this difference into account was to treat the Common Entrance Score as a surrogate for ability and knowledge.

Variable 11. Adult Learning and Potential test — T-79 (RALPT)

This test developed by Reid (1979) had been used for selecting adults for admission to institutions below university level. The various sub-tests measure verbal ability, deductive and inductive reasoning and spatial ability.

4. Teacher Characteristics

Variable 12. Students' Perceptions of Teacher Behaviour (PerTeaBeh)

This scale developed by Leo-Rhynie (1978) attempted to measure students' perception of teachers' practices and attitudes, which are considered favourable to learning.

5. School Characteristics

Variable 13. Students’ Perception of School Resources (PerScRes)

This scale was intended to obtain a rating of the school facilities and administrative procedures, which in students’ opinion could have made a difference to their achievement.

Variable 14. The Dependent Variable: The Criterion of Achievement (ACHIEV)

Students’ performance in the G.C.E. ‘O’ levels and CXC examinations represented the criterion of achievement.

Nominal Variables

Variable 15. Students’ Sex

Variable 16. School Location

THE SAMPLE

The sample was taken from the Dominican student cohort which sat Common Entrance Examination in 1983 for entry to high school in that year. Students, in addition, had attained the 5th form without repeating a class. Thus, in one sense the members of the sample were selected for the researcher in a quasi-random fashion, partly by the candidates themselves and partly by the policy regarding promotion at each of the secondary schools. Eight of the ten secondary schools featured in this investigation.

ADMINISTRATIVE PROCEDURES

The battery of tests had been piloted on a group of students who were in the fifth form the previous year. Piloting was undertaken to test the clarity of the instruments and to establish their reliabilities. Some changes were made to the scales constructed by the researcher. The pilot test gave an idea of the time required for completing the various instruments and the sequence in which they should be given. Generally, students completed the battery in the 3-hour slot, which had been requested. The administration of the instruments was carried out as far as possible under the same conditions at all the institutions. The researcher was responsible for this task.

THE SCHEME FOR DATA ANALYSIS

The analysis of the data was structured in such a way as to address a number of concerns. Measures of central tendency, plus tests for skewness were employed to determine whether the variables violated the normality assumption. "t" tests were used to explore the possible significant differences between boys, overall, and girls, overall, between the urban and rural sub-samples. ANOVA, followed by Scheffé’s *post hoc* test were computed to determine which sex partitions were significantly different from each other. Intercorrelations among the variables (except PerTeaBeh) were established and the resulting matrix was entered into a factor analysis in order to validate the theoretical model and also to note with which variables the criterion clustered. Correlational techniques were utilized to answer questions relating to verbal ability and performance in English language and the rest of the examination. The scores obtained by individual students in each subject were totalled and correlated with the overall score allocated to teachers of the respective subjects on the PerTeaBeh scale. A stepwise multiple regression was calculated to identify the variables which best predict achievement.

SECTION FOUR: PRESENTATION AND ANALYSIS OF DATA

A. Data for the Sample Overall and Sub-groups

The means, standard deviations, midpoints and minimum and maximum scores of the thirteen variables under consideration are presented in Table 4:1 for the total sample to indicate variability and spread.

Table 4:1 Means, S.D.s, Mid-points, Minimum and Maximum Scores of Variables for Total Sample

Variables	Mean	S.D.	Mid-point	Minimum	Maximum
ParEd	3.05	1.56	4	1	7
ParOc	2.95	1.05	3	1	6

FamBkCh	51.60	4.36	37	13	63
StdHabs	54.19	14.68	50	0	100
LocCon	64.05	8.89	57	19	95
AchMo	116.88	9.95	84	28	140
EXTRA	13.06	2.97	12	0	24
NEURO	13.06	4.24	12	0	24
CoEnSc	350.62	19.54	NA	NA	NA
AcaSeCon	41.04	4.92	30	10	50

Table 4:2 indicates that there are only four significant differences between the sexes: females display better study habits and are more neurotic than males, while the latter have significantly higher scores on the mental ability test and the external examinations.

Table 4:2 Means and S.D.s for Variables: Male and Female Sub-samples (Males, N= 100; Females, N=189)

Variables	Males		Females		"t"	Level of Significance*
	Mean	S.D.	Mean	S.D.		
ParEd	3.08	1.60	3.03	1.53	-0.27	N.S.
ParOc	3.09	1.09	2.89	1.02	-1.44	N.S.
FamBkCh	52.00	4.63	51.39	4.20	-1.10	N.S.
StdHabs	49.77	14.81	56.52	14.09	3.75	.001
LocCon	63.48	9.28	64.34	8.68	0.77	N.S.
AchMo	115.79	9.50	117.47	10.15	1.40	N.S.
AcaSeCon	40.87	5.12	41.12	4.82	0.41	N.S.
EXTRA	13.12	2.92	13.02	3.00	-0.26	N.S.
NEURO	12.29	4.25	14.50	4.03	4.11	.001
CoEnSc	350.82	22.66	350.51	17.72	-0.12	N.S.
RALPT	60.28	9.05	55.41	9.60	-4.26	.001
PerScRes	27.67	6.15	26.38	6.17	-1.69	N.S.
ACHIEV	76.79	26.58	61.67	24.58	-4.84	.001

*Significance determined from computer print-outs

Table 4:3 Means and S.D.s for Variables: Urban/Rural Sub-samples (Urban, N= 215; Rural, N=74)

Variables	Rural		Urban		"t"	Level of significance
	Mean	S.D.	Mean	S.D.		

ParEd	2.98	1.54	3.07	1.56	-0.38	N.S.
ParOc	2.95	0.88	2.97	1.10	-0.06	N.S.
FamBkCh	51.93	4.10	51.48	4.44	0.79	N.S.
StdHabs	59.66	14.72	52.30	14.22	3.74	.001
LocCon	63.75	8.97	64.14	8.88	-0.32	N.S.
AchMo	115.11	10.71	117.50	9.62	-1.70	N.S.
AcaSeCon	41.94	4.48	40.72	5.04	1.96	N.S.
EXRA	13.66	2.78	12..88	3.01	1.89	N.S.
NEURO	12.45	4.14	14..11	4.20	-2.75	.01
CoEnSc	350.94	19.25	350.50	19.67	0.17	N.S.
RALPT	57.17	10.02	57.06	9..59	0.08	N.S.
PerScRes	25.64	5.23	27.23	6.44	-2.13	.05
ACHIEV	67.45	23.55	66.70	27.17	0.21	N.S.

According to Table 4:3 three significant differences have emerged between the groups:

- The rural group has significantly better study habits,
- is less neurotic and
- has poorer school resources than the urban group.

The performance of students in each of the eight schools on the criterion ACHIEV is given in Table 4: 4.

Table 4:4 SCHOOL BASED PERFORMANCE ON ACHIEV

Schools	N	Mean	S.D.
A	53	67.89	25.46
B	48	82.89	30.49
C	41	44.68	18.61
D	19	65.42	22.96
E	63	67..96	22.12
F	13	85.31	24.58
G	42	62.86	21.34
H	10	65.00	20.33

The outcomes of the statistical analyses indicated that students at School C performed significantly lower than peers at Schools, A,B, E, and F, while those attending School G had significantly lower scores than students from School B.

B. Intercorrelations Among Variables

i. Data based on the major variables

While for the total sample, all the variables except EXTRA were significantly interrelated, and ParEd, FamBkCh, LocCon, AcaSeCon, CoEnSc, RALPT and PerScRes were significantly related to the criterion, ACHIEV, there was a different pattern of associations for the partitions. In all of these, ParEd and ParOc, on the one hand, and CoEnSc and RALPT on the other hand were significantly correlated. In most partitions except co-educated males, (where the relationship was significant at lower levels - .05 and .005, respectively) CoEnSc and RALPT were related to ACHIEV. AcaSeCon, with a focal role in the urban and female sub-samples, also featured in most partitions except males in the single-sex school, and was related to ACHIEV in two female groups.

NEURO was negatively associated with StdHabs in each of the female-based partitions as well as in the all-male sub-sample. FamBkCh was significantly associated with ACHIEV only in the female sub-sample.

The variables, ParEd, AcaSeCon and PerScRes were significantly related to ACHIEV in the urban sub-sample although they did not feature in the rural setting. In the all-female sub-sample, EXTRA was related to ParEd. In general, the personality variables featured more strongly in the female and urban partitions than in the male and rural ones.

ii. Correlations Between performance in English and ACHIEV and Performance in Verbal Ability

Table 4:5 indicates the level of significance and the size of the correlation between performance in English and that in the other subjects taken at the examinations (excluding English).

Table 4:5 CORRELATIONS BETWEEN PERFORMANCE IN ENGLISH AND ACHIEV MINUS ENGLISH

Groups	N	R	Level of Significance
Total Sample	289	.448	.001
School A	53	.605	.001
School B	48	.650	.001
School C	41	.365	.05
School D	19	.421	.001
School E	63	.441	.001
School F	13	.387	NS
School G	42	.121	NS
School H	10	.014	NS

As can be seen from this table, the association between performance in English and the rest of the examination was significant in English and the rest of the examination was significant in six instances. Although this was not the case in Schools, F, G and H, the correlations demonstrated for Schools A and B were particularly robust.

Table 4:6 displays the correlations between performance in English and items measuring verbal ability on the mental ability test, RALPT.

Table 4: 6 CORRELATIONS BETWEEN PERFORMANCE IN ENGLISH AND VERBAL ABILITY SCORES

Groups	N	R	Level of Significance
Total Sample	289	.413	.001

School A	53	.508	.001
School B	48	.497	.001
School C	41	.310	.05
School D	19	.504	.05
School E	63	.125	NS
School F	13	.350	NS
School G	42	.437	.005
School H	10	.085	NS

The pattern revealed in this table is similar to that of Table 4:5. However, in this table, School D had a slightly higher correlation than School B and at School E the relationship was not significant.

iii. **Correlations Between ACHIEV and PerTeaBeh**

Table 4:7 displays the relationship between ACHIEV and PerTeaBeh.

Table 4:7 CORRELATIONS BETWEEN ACHIEV AND PerTeaBeh

Groups	N	R	Level of Significance
Total Sample	289	.101	.001
School A	53	.196	.001
School B	48	.208	.005
School C	41	-.199	.005
School D	19	-.069	NS
School E	63	.138	.005
School F	13	.122	NS
School G	42	.146	.05
School H	10	.072	NS

The overall correlation between these variables, though reaching a level of significance was, nonetheless, unremarkable, perhaps as a result of the poor showing at certain schools. While there were six instances of significance, one of these (School C) has actually emerged as a negative relationship.

iv. **Correlations between CoEnSc and ACHIEV**

Table 4:8 CORRELATIONS BETWEEN CoEnSc and ACHIEV

Groups	N	R	Level of Significance
Total Sample	289	.411	.001
School A	53	.561	.001

School B	48	.550	.001
School C	41	.0750	NS
School D	19	.411	.05
School E	63	.284	.05
School F	13	.889	.001
School H	10	-.0856	NS

v. **Correlations between RALPT and ACHIEV**

Table 4:9 CORRELATIONS BETWEEN RALPT AND ACHIEV

Groups	N	R	Level of Significance
Total Sample	289	.495	.001
School A	53	.562	.001
School B	48	.423	.001
School C	41	.233	NS
School D	19	.701	.001
School E	63	.293	.05
School F	13	.626	.05
School G	42	.429	.005
School H	10	.1746	NS

C. **Results of The Stepwise Multiple Regression Analysis**

In order to select the variables which could best account for achievement, the stepwise regression procedure was selected. Through this method, the variables were entered in the regression equation one by one, so as to obtain a better idea of the contribution of each predictor. In attempting to identify the best predictors of ACHIEV by this procedure, the variables, ParEd, ParOc, FamBkCh, LocCon, AcaSeCon, StdHabs, EXTRA, NEURO, RALPT, CoEnSc, PerScRes and AchMo were entered into the regression equation. Of these five were selected as significant predictors.

The most significant contributing variable was RALPT, while CoEnSc was next.

Thus the cognitive variables were responsible for 28.10 per cent of the total variance of 33.03 per cent . The personality variables, AcaSeCon and NEURO jointly contributed 2.72 per cent, and PerScRes. 2.21 per cent.

A separate regression equation was calculated for the male and female sub-samples. This time only the five significant predictor variables were entered in the equation. For the males, only the cognitive variables featured as significant predictors while for the females, AcaSeCon was along with RALPT and CoEnSc still important. An interesting difference in the results for the male sub-sample was the greater contribution of CoEnSc (18.12 per cent of a total of 21.98 per cent explained variance) whereas for the females, COEnSc contributed only 5.67 per cent of the total explained variance of 32.12 per cent.

In view of the importance of verbal ability highlighted in certain studies and the questions posed in Section Three, another regression equation was calculated. In this instance RALPT was replaced by the scores measuring verbal ability. The results

of this analysis were not very different from the previous one. However, verbal scores accounted for a little less variance than RALPT (20.04 per cent as against 23.45 per cent). For the male sub-sample there were still only two predictors but verbal scores replaced CoEnSc as the main predictor, while for the female sub-sample, ParEd emerged as a predictor. While it is obvious that the verbal scores are not as powerful as RALPT for the total sample and female group, its contribution is, nonetheless, significant, as it proves to be the main predictor for all groups under scrutiny.

SECTION FIVE — INTERPRETATION OF THE FINDINGS

The findings will be discussed in terms of the questions posed.

1. Which inputs are significantly related to achievement in the secondary school system in Dominica?

Family Background Characteristics

The results of this investigation have provided support for the view that the psycho-social aspects of the home are more important than variables such as parental occupation or level of income, commonly used indices of social class.

Of the three variables in this dimension, ParOc was not associated with achievement for the total sample, although it was significantly related to achievement at Schools A and G (positively) and at School C (negatively). This is consistent with Miller's (1970) and Kostakis' (1987) findings that social class as indexed by father's occupation is relatively unimportant as an influential variable in school achievement.

On the other hand, ParEd (significantly correlated with ParOc) has proved to be one of the mediating variables between social class and attainment. The former exhibited a significant relationship with the criterion , ACHIEV, for the total sample, and urban and female sub-samples. (It is to be noted that the female and urban sub-samples being larger than the male and rural sub-samples tend to share the characteristics of the total sample.) This link between ParEd and attainment is consonant with the results of Kostakis (op. cit.), Niles (1981) and Cox (1986). The absence of any significant relationship between ParEd and the criterion in the male sub-sample, may be attributed to the fact that males are subjected to less parental surveillance and less parental dominance than females (Seaton, 1980); and may therefore be less susceptible to the influence of parental education.

FamBkCh, measuring the psycho-social characteristics of the home, in accordance with the findings of Marjoribanks (1979), displayed a significant relationship with the criterion in the total sample and female sub-sample, and was significantly related to all the cognitive variables at School F. This variable, however, was not relevant to males' achievement.

The results of the factor analysis indicated that the factor, Social Class (on which ParOc, ParEd and FamBkCh loaded significantly) was negatively related to achievement in the male sub-sample. This corroborated Sewell and Shah's (1968) conclusion that females' attainments appear to be more closely linked to the essential criterion of family background status, while those of males are more strongly related to academic ability. While two of the variables of the Social Class factor were significantly associated with achievement, the results of the factor analysis demonstrated that this factor was responsible for very little variance (.49 per cent) in the criterion. This is not unexpected given the selectivity of the sample. Brimer et al.'s (1978) comments seem very appropriate to this sample:

"When the level of education is such that the learner's prior history (family and school) determines those who will be admitted to it, then social class of family will cease to exert an important influence amongst the survivors.

Differences in achievement at this stage will be largely attributable to differences amongst students in their academic inclination and their personality and character and to differences between schools in their quality of instruction and/or possession and disposition of resources" (p.194).

The Cognitive Dimension

The factor which accounted for most of the variance in the criterion was the Cognitive and School Characteristics factor. Each of the variables loading on this factor will be examined in turn.

Common Entrance Score (CoEnSc)

CoEnSc, in keeping with the outcomes of Richardson's (1977) and Hamilton's (1979) research, was significantly associated with achievement for the total sample at the .001 level; but among the males in the co-educational school the correlation between ACHIEV and CoEnSc was significant only at the .05 level. The fact that CoEnSc was significantly correlated with ParEd and FamBkCh for the total sample confirms Bibby and Peil's (1974) opinion that the C.E.E. measures not only the candidate's ability but also the educational climate of the home.

Mental Ability (RALPT)

Ausubel et al. (1978), Ragbir (1975) have observed high correlations between mental ability and tests of achievement. This investigation produced similar outcomes. The better performance of males overall, on RALPT may be explained by the fact that males in the single-sex school who formed almost fifty per cent of the total male sub-sample had the highest level of scores on both sections of the test.

Perception of School Resources (PerScRes)

This variable measured students' perception of three types of resources:

- people – teachers' skills and personal qualities;
- time – periods for subjects and for study; and
- material – facilities and equipment.

It is important to note that only 3 of 11 items require an outlay of expenditure; and that the variable focuses more on teacher quality and school organization. The significant relationship between PerScRes and the criterion supports the results of Hamilton (1981), Leo-Rhynie (1978) and Webb (1985) on the contribution of school and teacher factors to achievement. However, the relationship observed between PerScRes and ACHIEV may also be a function of the allocation of the better students within the urban area to the schools with "better" teacher and material resources.

Study Disposition

The Study Disposition factor was composed of variables such as StdHabs, NEURO, LocCon, EXTRA, AcaSeCon and FamBkCh. Although this factor as a whole made a small contribution to the variance in the criterion (1.69 per cent) for the sample overall, this was more important among the female sub-sample than among the males. The variables within this factor which were significantly related to the criterion at the .001 level were AcaSeCon and LocCon.

Academic Self-Concept (AcaSeCon)

In this investigation the role of AcaSeCon was pivotal, as evidenced by its interrelation with the other personality variables, as well as the family background and cognitive dimensions. Its link with FamBkCh is congruent with Im-Sub Song and Hattie's (1984) discovery that AcaSeCon was affected by the psycho-social factors operating in the family. As to its relationship with StdHabs, Heims (1984) has demonstrated that students' academic self-concept improved as a result of attending a study skills training programme. In all female sub-samples used in this study, AcaSeCon was significantly related with both ACHIEV and StdHabs.

Locus of Control (LocCon)

The association of LocCon and StdHabs noticed here is in accordance with the findings of Biggs (1976,1985); and underscores Thomas and Rohwer's (1985) claim that self-efficacy (the belief that one can control the outcome of one's learning) should affect the amount of studying exhibited by students and the choice of study methods adopted.

Study Habits (StdHabs)

Researchers such as Wikoff (1980) and Nist et al. (1985) have demonstrated that good study skills improve achievement. This has not been substantiated for the total sample; but StdHabs was significantly associated with ACHIEV in the female sub-sample.

However, with reference to the total sample, StdHabs was significantly related to two variables which were themselves related to achievement – LocCon and AcaSeCon, and negatively to NEURO. Since the girls formed the majority of the

sample and exhibited such high levels of neuroticism, this may have reduced the effectiveness of their study habits.

2. Which of the independent variables are the best predictors of achievement for the sample overall, as well as for male and female sub-sample?

Mental Ability (RALPT)

Crano et al. (1972) in trying to determine the causal link between intelligence and achievement, established that the predominant causal sequence was that of intelligence causing achievement. Support for this view is provided by the emergence of RALPT as the main predictor of achievement for the total sample and female sub-sample; and this finding is consistent with that of McKnight (1985).

Common Entrance Score (CoEnSc)

CoEnSc was the second best predictor of achievement for the total sample and the female sub-sample. However, it was the strongest for the male sub-sample. It is interesting that CoEnSc should emerge as the main predictor for males and not for females. There may, however, be a reasonable explanation. Girls' success in the Common Entrance Examination (C.E.E.) (especially those from the urban area) might have been due to their better level of preparation and to the quality of the primary school attended. Thus, it is quite possible that boys' success in the C.E.E. was based solely on their innate ability.

Academic Self-Concept (AcaSeCon)

AcaSeCon was the third predictor for the total sample and for females. The importance of AcaSeCon as a predictor surfaced in the research of Allen (1984) and Andrews (1987). However, the failure of AcaSeCon to predict male achievement may be explicable in terms of the different levels of self-esteem observed between the sexes. Ellerman (1980) and Foon (1988) have also noted that males generally have greater self-esteem than females. However, it can be inferred that it is the females with a positive academic self-concept who are more likely to achieve; whereas, since males have greater self-confidence, their achievement is less dependent on their academic self-concept.

Perception of School Resources (PerScRes)

This accounted for a small percentage of variance in the criterion and was a predictor only for the total sample. The predictive power of this variable confirms Rutter's (1979) view that it is the social, rather than the financial inputs, which account for variation between schools. It also confirms that issues such as content covered and the management of instruction time which surface in the research on effective primary schools are also applicable at the secondary level.

3. Is there a significant difference between the achievement of
 - a. boys, overall, versus girls, overall;
 - b. students in urban and rural secondary schools; and
 - c. students at each of the 8 secondary schools under review?

3(a) Boys, overall, had a significantly higher level of achievement than girls, overall. This is in keeping with the findings of McKnight (1985) and Cameron (1962). However, there is a possibility that this outcome might have been influenced by the very high performance of boys at one school (School B) where their number was almost 50 per cent of the total sub-sample.

3(b) There was no significant difference between the achievement of students in rural and urban secondary schools. Too much reliance cannot be placed on this outcome, since the rural sub-sample was much smaller than the urban one.

3(c) Students at Schools A,B, D, E, and F had a significantly higher level of achievement than their counterparts at School C; while those at School B performed significantly better than their peers at School G. Although there may be several unexplained factors accounting for this difference, the schools differed significantly on the variables, RALPT, and CoEnSc, the main predictors of achievement. This result is consistent with those of Rutter et al. (1979) and Brimer et al. (1976) which respectively demonstrated the effects of an intellectual ability mix and selectivity of admission of the schools investigated.

4. To what extent does the level of performance in English Language relate to that on the items of the Learning Potential Test measuring verbal ability?

5. To what extent does verbal ability predict attainment?
6. To what extent does level of performance in English Language relate to that in the other areas studied?

These three questions will be considered together. The verbal score on RALPT had a moderately significant relationship with performance in English language. When the verbal score was entered into the regression equation in place of RALPT, the former also emerged as the main predictor, accounting for 20.04 per cent of the 32.10 explained variance. Interestingly, verbal ability was the best predictor for both males and females. This is surprising, in view of the alleged superiority of females in that domain (Maccoby and Jacklin, 1974; Sherman, 1978). Instead, the findings lend credence to Hyde and Linn's (1988) suggestion that verbal ability tests provide gender-unbiased measures of cognitive abilities, compared with mathematics tests.

The significant moderate relationship between performance in English language and that in the other areas studied corresponds with results obtained by Hunt (1985). It is noteworthy that the relationship was quite robust at the two schools (A and B) with the highest percentage of students reportedly speaking only English at home. This suggests that the use of Creole may affect students' academic literacy and achievement.

Thompson (1986) in discussing Jamaican students' writing problems observed:

"Where cognitive patterns demanded by the school are valued and practised in the culture, literacy is facilitated. Where the converse exists, the mismatch creates problems for the acquisition and use of literacy... This is because patterns ingrained by their cultural background are in constant conflict with those required in academic situations" (p.8).

7. Is there any evidence that the level of performance in the Common Entrance Examination is related to performance five years later in the external examinations?

The emergence of CoEnSc as the second best predictor for females and the main predictor for males establishes the predictive validity of the Common Entrance Examination (C.E.E.). Yet, since for girls it seems to be measuring intellectual climate of the home and the quality of primary school attended, in addition to innate ability, it is worthwhile to ensure that an equal number of each sex "pass" the examinations. Yet, in addition to performance at the C.E.E., there are other determinants of achievement. For example, Hamilton, (op.cit.) observed that middle-class boys who had not passed the C.E.E. performed better at secondary school than lower-class boys who had passed.

In the Dominican situation school and teacher resources seem to be concomitant, for at some schools students who did not "pass" the C.E.E. managed to reach 5th form without repeating, whereas at others, many who were successful in the C.E.E. have repeated a form or have dropped out of school.

8. Is there any evidence that students' perception of teacher behaviour is related to performance in individual subjects?

PerTeaBeh, measuring students' perception of teachers' behaviour in terms of both affective and cognitive criteria displayed a rather weak but significant relationship with the criterion. Among the explanations can be offered for this is the fact that the number of inexperienced teachers being evaluated might have affected the outcome, for Sullivan and Skanes (1974), on the basis of their own research, coupled with the findings of other studies, noted that students' ratings of inexperienced instructors displayed lower correlations with achievement than did their ratings of experienced staff.

LIMITATIONS

Although the sample is representative of the recognised secondary schools in Dominica, the small size of the rural sub-sample and the limited number of single-sex institutions involved, do not permit any valid generalisations to be made from findings generated for these groups. The gender imbalance was not a function of sample selection, but rather a reflection of the sex ratio in the secondary school population.

It is recognised that the population was a selective one; so steps were taken to investigate whether the variables were normally distributed. The few violations of the assumptions for multiple regression would, it was felt, be counteracted by the robustness of the procedures utilised.

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