

In Favour of Coeducation: The Educational Attitudes of Students from Coeducational and Single-Sex High Schools

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Four hypotheses about differences in educational attitudes of students in coeducational and single-sex high schools were derived from previous research on the social-psychological environments of such schools. These hypotheses were that, compared with students from single-sex schools, coeducational school students would have more positive attitudes toward teachers, more positive self-concepts of academic ability, more positive attitudes toward high school, and stronger preferences for the type of school (coeducational or single-sex) in which they were enrolled. The research participants included 2,029 grades 10 to 12 students from five coeducational, four all-female, and four all-male separate high schools. The students completed a questionnaire that included scales relevant to each of the hypotheses. The results provided support for the second and fourth hypotheses and partial support for the first and third.

Quatre hypothèses au sujet des différences entre les attitudes des élèves qui fréquentent des établissements mixtes ou non-mixtes ont été tirées d'une recherche antérieure sur les aspects socio-psychologiques des écoles secondaires mixtes et non-mixtes. D'après ces hypothèses, les élèves des écoles mixtes auraient, en comparaison des élèves des écoles non-mixtes, 1) une attitude plus positive vis-à-vis des professeurs, 2) une meilleure image de soi quant à leurs aptitudes scolaires, 3) une attitude plus positive par rapport aux études secondaires et 4) une préférence plus marquée pour le type d'école (mixte ou non-mixte) qu'ils fréquentent. La recherche a porté sur 2,029 élèves de 10^e et de 12^e année fréquentant cinq écoles mixtes, quatre écoles réservées aux jeunes filles et quatre autres réservées aux garçons. Les élèves ont rempli un questionnaire qui comprenait des échelles de mesure pour chacune des hypothèses. Les résultats viennent étayer les hypothèses 2 et 4; quant aux hypothèses 1 et 3, elles n'ont été que partiellement confirmées.

Coeducation . . . violates a custom so universal that it seems to express a fundamental instinct. In all ages of history and in all stages of civilization from savagery up, in the Orient, in ancient Greece and Rome, and with few exceptions in modern Europe, the dawn of puberty is marked by segregation of the sexes, especially for every purpose that can be called educational. (Hall, 1906, p. 653)

This strong denunciation of coeducation by G. Stanley Hall, one of North America's most influential psychologists at the outset of this century, serves to remind us that, whereas today coeducation, including its educational value, is virtually taken for granted, this was not always the case. During the 19th century and the early 20th century, coeducation was a widely contested and emotionally charged issue (Pekin, 1939; Stamp, 1970).² Although the debate on coeducation versus single-sex education subsided as arguments on behalf of coeducation prevailed, and the North American secondary school system emerged as predominantly coeducational, the case for coeducation rested more on personal intuition and ideology than on a solid foundation of empirical evidence. The truth of the matter is that we know very little about the impact of coeducation and single-sex education on students, and, accordingly, an increasing number of professionals have recently called for an examination of the pros and cons (e.g., Byrne, 1978; Deem, 1984; Gillett, 1982; Lockheed, 1976).

Throughout the history of the debate on coeducation versus single-sex education, proponents of the latter have frequently emphasized that the coeducational school environment has an adverse influence on the academic adjustment of students. Nevertheless, the extant evidence on one major criterion of academic adjustment, scholastic achievement, remains inconclusive. Research in both the United States (Cornelison, 1973; Kolesnick, 1969) and Great Britain (Irving, 1976; Wood & Ferguson, 1974) fails to show a consistent achievement advantage among students from either type of institution. The present study compares students from coeducational and single-sex schools on a second important dimension of academic adjustment—their educational attitudes. The importance of educationally relevant attitudes to the academic progress of students has been clearly demonstrated (Marjoribanks, 1976).

In two earlier reports, we presented data concerning the social psychological environments of coeducational and single-sex separate high schools in Ontario (Schneider & Coutts, 1979, 1982). On the assumption that there exists a direct correspondence between school environment variables and student attitudes these data permit us to derive predictions about school-type differences in educational attitudes. In the first study (Schneider & Coutts, 1979), teachers

(most of whom taught in the schools from which the present sample was

drawn) rated the acceptability of students' displaying in class each of a series of stereotypically feminine and masculine traits and completed a measure of their beliefs about the teaching process. The acceptability ratings suggested a tendency for teachers in coeducational schools to display a more flexible (androgynous) orientation than teachers in single-sex schools: the former were less rejecting of the display of masculine traits and less demanding of the display of feminine traits. The data for beliefs about teaching revealed that coeducational school teachers tended to be more likely to believe that a teacher should be concerned with student interests and needs and to believe in the educational value of displaying empathy, friendliness, and consideration in their relations with students. On the basis of these findings, we infer that students should be more favourably predisposed to such teachers and so to schools in a coeducational setting.

In our second study (Schneider & Coutts, 1982), students from coeducational and single-sex schools were administered scales from the High School Characteristics Index (HSCI; Stern, 1987) on which respondents are asked to describe their school environments. Each HSCI scale (e.g., Affiliation scale) is interpreted as a measure of environmental press, that is, as reflecting the extent to which the environment is perceived as contributing to the satisfaction of the relevant need (e.g. for affiliation). The results on several HSCI scales are relevant to students' attitudes about teachers. In general we found that, relative to students in coeducational schools, those from single-sex schools perceived higher *abasement press* (e.g., "The teacher very often makes you feel like a child") and lower *objectivity press* (e.g., "Everyone has the same opportunity to get good marks here because the tests are marked fairly"). Moreover, students in single-sex schools perceived greater emphasis on discipline, order, and control (i.e., described their schools as lower in *impulsiveness press* and generally higher in *deference press*).

The results from these two investigations led us to expect that coeducational school students would report more favourable attitudes toward teachers than their single-sex school counterparts (Hypothesis 1). In addition, the finding that single-sex school students perceived higher abasement press (and, accordingly, saw an environment that is more likely to foster a sense of self-depreciation than self-confidence) led to the expectation that coeducational school students would report more favourable self-concepts of academic ability than would single-sex school students (Hypothesis 2).

Measures of *affiliation press* and *play press* revealed that students in the coeducational school environment perceived a greater emphasis on affiliation and pleasurable nonacademic activities. These results combined with those that contributed to the expectation of more favourable attitudes toward teachers and academic self-concepts to generate two additional hypotheses. We expected that coeducational school students would report

more favourable attitudes toward high school (Hypothesis 3) and that coeducational school students would show a stronger preference for coeducation than single-sex school students would for single-sex school education (Hypothesis 4).

METHOD

Subjects

The sample was the same as in the Schneider and Coutts (1982) study. Subjects were high school students from five coeducational schools, four all-female schools, and four all-male schools. The coeducational-school students included 210 grade 10 males, 215 grade 10 females, 211 grade 12 males, and 212 grade 12 females. The single-sex school students included 294 grade 10 males, 295 (grade 10 females, 295 grade 12 males, and 297 grade 12 females).³ All of the participating schools were part of the Roman Catholic Separate School System and were thus attended largely by Catholics.⁴ The percentages of lay teachers in the coeducational, all-male, and all-female schools were 77 (range=51–91), 75 (range=57–83), and 71 (range=48–87), respectively, and the percentages of female teachers were 36 (range=22–45), 7 (range=0–11), and 86 (range=75–100), respectively. The schools were located in urban areas of Southwestern Ontario (minimum city population of 80,000). Eighty-three percent of the sample provided information about the occupations of the heads of their households that was classifiable according to Blishen's (1967) index of socio-economic status. Analysis of variance indicated no significant social class differences due to school type, sex, or grade with $df=1$, 1685, the probability levels for all main and interaction effects were well above .20).

Procedure and questionnaire

The four scales of this study formed part of a questionnaire administered on a group basis to the subjects during regular school hours. With the exception of the measure of students' preferences for coeducation versus single-sex education (School Preference Rankings) discussed below, all scales were presented in Likert format. There were four scales, each directly relevant to one of the hypotheses underlying the study.

Attitudes Toward Teachers Scale

This 7-item scale (for example, "Most teachers understand the needs and interests of their students" and "Most teachers are too rigid and narrow-minded") was adapted from one presented in Moore and Holtzman (1965)

and has a range of possible scores from 0 to 21 (where a high score indicates a positive attitude).

Self-Concept of Academic Ability Scale

This 4-item scale (for example, "How do you rate yourself in ability compared with those in your grade at school?" and "Do you think you have the ability to graduate from university?") was adapted from Binder (1965/1966) and has a range from 0 to 16 (where a high score indicates a positive self-concept).

Attitudes Toward High School Scale

This 7-item scale (for example, "A high school education will help me to be a good citizen" and "I can learn more working on a job than in high school") was adapted from Remery (1967) and has a range from 0 to 21 (where a high score indicates a positive attitude).

For each of these three scales, a reliability coefficient (coefficient alpha) had previously been computed (Grant & Schneider, 1979). The coefficients respectively were .73, .81, and .65.

School Preference Rankings

This is an index of the students' ranked preferences for three kinds of high school in response to the following question: "Below are three kinds of school that you might attend. Which do you prefer? (RANK from 1 to 3): __ coeducational—where boys and girls attend the same class; __ coinstitutional—where boys and girls attend different classes but engage in the same out-of-class activities (e.g., clubs, lunchroom, and home room); __ all-male or all-female—where only one sex attends the school."

RESULTS

The students' scores on the three attitude scales (Attitudes Toward Teachers, Self-Concept of Academic Ability, and Attitudes Toward High School) and the ranks they gave to the three kinds of high school (coeducational, coinstitutional, and single-sex) were the dependent variables, and school type, grade, and sex served as the independent classification variables. Means, standard deviations, and correlations among the six dependent variables are presented in Table 1. From this table, it is apparent that the attitude scales and the preference rankings are uncorrelated, and, thus, it is appropriate to analyse the attitude scales separately from the preference rankings. The data from the attitude scales were analysed by a School Type

TABLE 1
Means, Standard Deviations, and Intercorrelations of Dependent Variables

<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1. Attitude toward teachers	—					
2. Self-concept of academic ability	.22*	—				
3. Attitude toward high school	.46*	.19*	—			
4. Prefer coeducational school ^a	.02	-.04	.05	—		
5. Prefer coinstitutional school ^a	.03	.02	.01	-.38*	—	
6. Prefer single-sex school ^a	-.05	.03	-.06	-.72*	-.37*	—
Mean	11.41	10.99	14.37	1.45	2.01	2.41
Standard deviation	3.76	3.20	3.33	0.75	0.60	0.81

^aLow scores reflect high preference

* $p < .01$

x Grade x Sex multivariate analysis of variance followed by an individual three factor analysis of variance for each of the attitude measures. The preference rankings for each of the three kinds of high school were analysed by a School Type x Grade x Sex analysis of variance. In view of the large sample size, $p < .01$ was used to determine statistical significance.

The multivariate analysis of variance yielded significance for all effects except the School Type x Sex interaction. Which scales contributed to significance was determined by examination of the characteristic vector associated with each test. The significant effects and the scales contributing to each effect were as follows: School Type, $F(3,2007)=11.61$, $p < .01$ (Attitudes Toward Teachers and Self-Concept of Academic Ability); Grade, $F(3,2007)=25.80$, $p < .01$ (Attitudes Toward High School); School Type x Grade, $F(3,2007)=7.20$, $p < .01$ (Attitudes Toward Teachers and Attitudes Toward High School); Sex, $F(3,2007)=12.82$, $p < .01$ (Self-Concept of Academic Ability); Grade x Sex, $F(3,2007)=4.18$, $p < .01$ (Attitudes Toward Teachers and Self-Concept of Academic Ability); and School Type x Grade x Sex, $F(3,2007)=4.74$, $p < .01$ (Attitudes Toward Teachers). As will be seen, this pattern of results is generally consistent with that for the univariate analyses of variance.

Because our main focus is on the distinction between coeducational and

TABLE 2
Mean Scores of the Three Measures of Educational Attitudes By School Type, Sex, and Grade

School Type	Attitude Toward High School			Attitude Toward Teachers			Self-concept of Ability		
	Gr. 10	Gr. 12	Both	Gr. 10	Gr. 12	Both	Gr. 10	Gr. 12	Both
Coed School Students	Male	15.15 (210)	13.42 (211)	14.28 (421)	Male	12.27 (210)	11.03 (211)	11.65 (421)	Male 11.56 (210)
	Female	15.80 (215)	13.92 (212)	14.86 (427)	Female	12.62 (215)	11.58 (212)	12.11 (427)	Female 11.28 (214)
	Both	15.48 (425)	13.67 (423)	14.57 (848)	Both	12.45 (425)	11.31 (423)	11.88 (848)	Both 11.42 (424)
Single-sex School Students	Male	14.43 (294)	14.06 (294)	14.24 (588)	Male	10.68 (294)	11.87 (294)	11.28 (588)	Male 10.82 (289)
	Female	14.70 (294)	13.72 (297)	14.21 (591)	Female	11.29 (294)	10.45 (297)	10.86 (591)	Female 10.31 (292)
	Both	11.57 (588)	13.89 (591)	14.22 (1179)	Both	10.98 (588)	11.16 (591)	11.07 (1179)	Both 10.56 (581)
Both School Types	Male	14.73 (504)	13.79 (505)	14.26 (1009)	Male	11.34 (504)	11.52 (505)	11.43 (1009)	Male 11.13 (499)
	Female	15.16 (509)	13.80 (509)	14.48 (1018)	Female	11.85 (509)	10.92 (509)	11.39 (1018)	Female 10.72 (506)
	Both	14.95 (1013)	13.79 (1014)	14.37 (2027)	Both	11.60 (1013)	11.22 (1014)	11.41 (2027)	Both 10.93 (1005)

NOTE: Numbers in parentheses indicate the number of cases upon which that mean was calculated. High scores equal positive attitudes of self-concepts.

TABLE 3
Mean Rankings for the Three Kinds of High School by School Type, Sex, and Grade

School Type	Rankings of Coeducational School			Rankings of Coinstitutional School			Rankings of Single-sex School					
	Gr. 10	Gr. 12	Both	Gr. 10	Gr. 12	Both	Gr. 10	Gr. 12	Both			
Coed School Students	Male	1.07 (202)	1.21 (209)	1.14 (411)	Male	1.99 (176)	2.01 (183)	2.00 (359)	Male	2.90 (174)	2.76 (182)	2.83 (356)
	Female	1.05 (209)	1.19 (208)	1.12 (417)	Female	2.04 (185)	2.07 (187)	2.06 (372)	Female	2.90 (183)	2.70 (183)	2.80 (366)
	Both	1.06 (411)	1.20 (417)	1.31 (828)	Both	2.02 (361)	2.04 (370)	2.03 (731)	Both	2.90 (357)	2.73 (265)	2.81 (722)
Single-sex School Students	Male	1.38 (269)	1.61 (266)	1.50 (535)	Male	2.01 (252)	1.98 (245)	2.00 (497)	Male	2.46 (246)	2.20 (250)	2.33 (496)
	Female	1.93 (261)	1.88 (267)	1.91 (528)	Female	1.94 (249)	2.04 (256)	1.99 (505)	Female	1.95 (261)	1.92 (264)	1.94 (525)
	Both	1.65 (530)	1.75 (533)	1.70 (1063)	Both	1.97 (501)	2.01 (501)	1.99 (1002)	Both	2.20 (507)	2.06 (514)	2.13 (1021)
Both Student Types	Male	1.25 (471)	1.44 (475)	1.34 (946)	Male	2.00 (428)	1.99 (428)	2.00 (856)	Male	2.64 (420)	2.44 (432)	2.54 (852)
	Female	1.54 (470)	1.58 (475)	1.56 (945)	Female	1.98 (434)	2.05 (443)	2.02 (877)	Female	2.34 (444)	2.24 (447)	2.29 (891)
	Both	1.39 (941)	1.51 (950)	1.45 (1891)	Both	1.99 (862)	2.02 (871)	2.01 (1733)	Both	2.49 (864)	2.34 (879)	2.41 (1743)

NOTE: Students gave a rank of 1 to their first choices, 2 to their second choices, and 3 to their third choices. Numbers in parentheses indicate the number of cases upon which that mean was calculated.

single-sex schools, primary attention is given to the effects of school type, including its interactions with grade and sex. Therefore, detailed findings concerning school type are reported first, followed by a more concise review of those pertaining specifically to grade and sex.

Effects of School Type

Students' *Attitudes Toward Teachers* showed a significant main effect for school type, $F(1,2009)=23.28$, $p<.01$, and significant interactions for School Type x Grade, $F(1,2009)=16.17$, $p<.01$, School Type x Sex, $F(1,2009)=6.33$, $p<0.1$, and School Type x Grade x Sex, $F(1,2009)=12.33$, $p<0.1$.⁵ Breakdown of the three-way interaction revealed, in support of Hypothesis 1, that for 3 out of 4 grade-sex combinations students from the coeducational schools had more favourable attitudes toward teachers than their single-sex school counterparts ($p<.01$; see Table 2 for relevant means). The one exception was the group of grade 12 males who showed no difference by school type.

Students' *Self-Concepts of Academic Ability* showed a significant main effect of school type, $F(1,2009)=18.76$, $p<.01$, but no significant interactions involving school type. In support of Hypothesis 2, the students in coeducational schools reported more positive self-concepts of academic ability than the single-sex school students (see Table 2 for means).

Students' *Attitudes Toward High School* showed a significant School Type x Grade interaction, $F(1,2009)=14.58$, $p<.01$. This interaction revealed that at the lower grade level, coeducational school students had more positive attitudes toward high school than the single-sex school students ($p<.01$), whereas no significant differences occurred at the higher grade level (see Table 2 for means). Thus, the findings lend partial support to Hypothesis 3 that coeducational school students would have more favourable attitudes toward high school.

The students were asked to rank order their *Preferences for Three Kinds of Schooling* (coeducational, coinstitutional, and single-sex) and the rankings given to each kind of schooling were analysed separately. For the rankings of coeducation, the main effect of school type, $F(1,1883)=330.52$, $p<.01$, and the School Type x Sex interaction, $F(1,1883)=47.78$, $p<.01$, were significant.⁶ As inspection of the means in Table 3 suggests and analysis of the interaction reveals, for both sexes coeducational school students showed a greater preference for coeducation than did the single-sex school students ($p<.01$).

The analysis of the rankings of coinstitutional schooling showed no significant effects. In light of the ipsative nature of the preference data and lack of significant effects for the rankings of coinstitutional schooling (thus the coinstitutional data represent a constant), the results on the preferences for single-sex schooling are virtually the mirror opposite of those for the

preferences for coeducational schooling. There were significant effects for school type, $F(1,1735)=384.76$, $p<.01$, and the School Type x Sex interaction, $F(1,1735)=27.92$, $p<.01$. Coeducational school students were much less in favour of single-sex schooling than were the single-sex school students.

The preference data indicate, as might be expected, that adolescents who are being educated in coeducational schools have a stronger preference for coeducation and a greater dislike of single-sex education than do those who are being educated in single-sex schools. Inspection of the means in Table 3 also reveals that the preference for one's current mode of education is much stronger among the coeducational school students than among the single-sex school students: the mean ranking given to coeducation by its students was 1.13, whereas the mean ranking given to single-sex education by its students was 2.13. Moreover, 90.22% of the coeducational school students gave coeducation as their first choice, whereas only 31.31% of the single-sex school students ranked single-sex schooling first. These results strongly confirm Hypothesis 4 that coeducational school students would be more favourably predisposed to coeducation than single-sex school students would be to single-sex education.

Effects of Grade and Sex

Apart from the manner in which grade and sex moderated the influence of school type (as reported above), several additional findings on their effects are noteworthy. Concerning the role of sex, a significant sex effect, $F(1,2009)=29.31$, $p<.01$, and Grade x Sex interaction, $F(1,2009)=6.95$, $p<.01$, revealed that males reported more positive self-concepts of ability than females although the difference reached significance only at the grade 10 level. Further, a significant Grade x Sex interaction, $F(1,2009)=81.9$, $p<.01$, and the previously mentioned three-way interaction for attitudes toward teachers indicated that males had more positive attitudes but only in grade 12 in single-sex schools ($p<.01$). A comparison of the preference rankings of the male and female single-sex school students is especially helpful here. The School Type x Sex interactions showed that the students from all-male schools displayed a much higher preference for coeducation ($p<.01$) and lower preference for single-sex education ($p<.01$) than the students from all-female schools.

Whereas grade did not significantly influence the students' academic self-concepts or consistently influence their preference rankings, it was consistently and significantly implicated in their other attitudes. Analyses of the three-way interaction for attitudes toward teachers showed that grade 12 students generally held more negative attitudes toward teachers than grade

10 students ($p < .01$); the one exception involved the single-sex-school males who showed the opposite result ($p < .01$). The significant effect of grade, $F(1,2009) = 71.53$, $p < .01$ and the School Type $\times$ Grade interaction for attitudes toward high school revealed that for all groups concerned, grade 10 students had more favourable attitudes toward high school than the grade 12 students.

DISCUSSION

In general, our four hypotheses about differences in the attitudinal orientations of coeducational and single-sex school students were supported by the results. We will consider these results in the context of evidence from English-speaking countries. However, there has been very little research on students' educational attitudes, especially in North America, and existing studies have typically relied on single-item indexes of attitudes.

With the exception of grade 12 males, students in coeducational schools reported more favourable attitudes toward teachers than did those in single-sex schools, thus providing support for Hypothesis 1. These results accord with the findings of Feather (1974) in Australia that boys in coeducational schools reported more satisfaction with teachers (no difference occurred among girls) and those of Dale (1971) in Great Britain that ex-students who had attended both types of school judged teachers in coeducational schools to be more helpful and friendly than teachers in single-sex schools. Furthermore, in support of Hypothesis 3, coeducational school students reported more favourable attitudes toward high school; however, the difference was significant at the grade 10 level and not the grade 12 level. Apparently, little research has considered attitudes toward school *per se*, although a few studies, with mixed results, have been concerned with students' happiness or satisfaction with school (Dale, 1971; Feather, 1974; Jones, Shallcrass, & Dennis, 1972).

In accounting for the differences between the two groups of students, it is important to keep in mind that our data are correlational and, therefore, are open to varying interpretations. One might suggest that school type differences are due to self-selection factors whereby students who choose mixed-sex schooling differ from those who choose single-sex schooling on such relevant variables as personality make-up (e.g., achievement orientation) and family background (e.g., parental values). Although it is impossible to rule out completely an interpretation in terms of self-selection, it contravenes evidence pointing to basic similarity between coeducational and single-sex school samples. As reported in this study, the samples were similar in religious background, socioeconomic status, and urban background; and, as reported elsewhere, they were similar in at least two personality variables—need for achievement and need for affiliation (Schneider & Coutts, 1982).

Thus, the present data suggest, with some confirmatory evidence from other research on attitudes toward teachers, that coeducation promotes more positive academic attitudes than single-sex education. A particularly telling indication of differences between the attitudes of the two categories of student is additional evidence that coeducational school students had more favourable self-concepts of academic ability (supporting Hypothesis 2).⁷ This may be the most worrisome finding: single-sex school students feel more negative not only about high school and its teachers but also about their personal academic competencies.

In light of the above findings, it is not at all surprising that the coeducational school students reported a stronger preference for coeducation than the single-sex school students did for single-sex education. Whereas 9 out of 10 coeducational school students gave coeducation as their first choice, less than a third of the single-sex school students chose single-sex education first. It is particularly relevant that a solid majority of the male single-sex school students (67.10%) ranked coeducation first, with only a small minority (21.57%) ranking single-sex education first. Moreover, even among female single-sex school students, as many opted for coeducation (44.13%) as for single-sex education (40.57%). The general preference for coeducation over single-sex education finds additional support from research conducted in both New Zealand (Irving, 1976) and Great Britain (Dale, 1971; Nicholls, 1967). This research shows that the majority of male and female students from both school types as well as ex-pupils with experience in both settings (Dale, 1971) reported a preference for coeducation.⁸

Where do our findings lead us? Needless to say, the results of this study as well as those of our previous investigations of the environments of the participating schools (Schneider & Coutts, 1979, 1982) favour coeducation. It is not insignificant that knowledge about the social-psychological environments of the high schools permitted accurate predictions of student attitudes. A school environment that is associated with positive feelings about teachers, the school, and one's academic ability is more desirable than one that is not.

However, lest one be overly convinced of the pervasive merits of coeducational schooling, several precautionary observations are in order. First, although our research is a step in the right direction, investigators have barely begun systematically to examine and compare the environments of coeducational and single-sex schools. What precisely are the distinguishing aspects of coeducation and single-sex education that impact differentially upon the students' academic and social adjustment? The present findings that the coeducational students were generally more positive toward their school environments and their own academic abilities were predicted from our earlier findings that the coeducational schools were perceived by the stu-

dents as more gregarious, friendly, tolerant of noncompliance and spontaneity, and conducive to the development of feelings of self-confidence and self-respect (Schneider & Coutts, 1982).

How can we account for these differential environmental perceptions and corresponding differences in educational orientations? Two of several entirely different but plausible explanations are that the differences are a function of the resulting dynamics of the sex composition of the student body, and that the differences may be linked to separate institutionalized belief structures underlying the two types of schooling. A third possibility is that the differences in the environmental perceptions and attitudes of coeducational and single-sex school students are not linked to intrinsic differences between the two modes of education. Instead, they may result from the fact that teachers and administrators with different personalities and/or teaching philosophies gravitate to the two different kinds of institution—that, for example, those predisposed to control and discipline are more inclined to work in single-sex schools (see Schneider & Coutts, 1982 for additional discussion).

Another precautionary observation concerns the fact that the present data pertain to only a subset of relevant educational variables. For instance, data that we have reported elsewhere (Schneider, Coutts, & Starr, 1979) indicate that our coeducational school students did not surpass our single-sex school students in educational aspirations even though, as reported here, they possessed more favourable educational attitudes. This finding and the inconclusive evidence concerning school type differences in achievement reviewed earlier suggest that negative attitudes may not adversely affect other areas of academic adjustment. Of course, the possibility remains that the attitudinal component of adjustment may offset academic advantages that inhere in the single-sex institution, thus suppressing the achievement of single-sex school students to the level of coeducational school students. Furthermore, there may be positive consequences of single-sex education and/or negative consequences of coeducation that we have not considered. For instance, in accordance with Horner's (1972) hypothesis that inter-sex competition increases fear of success in females, Winchel, Fenner, and Shaver (1974) found more fear-of-success imagery among coeducational than single-sex high school students.

Furthermore, a point that is commonly made in educational psychology, yet rarely given sufficient attention, and one that is critical to this discussion, is that research on coeducation and single-sex education invariably focuses on group data to the neglect of the individual. While most high school students may prefer coeducation and even adapt better to it, many may not. It is especially noteworthy that, despite the fact that girls in the single-sex schools viewed their schools as most repressive (Schneider & Coutts, 1982)

and possessed negative educational attitudes to the same extent as the boys from single-sex schools, a sizeable minority still opted for single-sex schooling. Speculating about why this is so, we suggest one reasonable possibility is that the all-female school represents a rare refuge in which females feel less vulnerable to the sex-stereotyped demands and sanctions of a male-dominated society (cf. Lentz, 1983; Lockheed, 1976). In short, it is quite likely that future research will demonstrate that there is a place for both single-sex and coeducational schools in the education of our children. In accordance with this thinking, we have found clearcut differences in the personalities and attitudes of students who prefer coeducation and those who prefer single-sex education (Schneider, Gupta, Starr, & Coutts, 1985).

The results on the roles of sex and grade level that were independent of school type merit consideration. The fact that male students reported possessing more positive academic self-concepts than female students (although at the grade 10 level only) readily ties in with the common finding that males, regardless of their actual achievement relative to females, display higher expectancies of success in a variety of academic and nonacademic areas (Frieze, Parsons, Johnson, Ruble, & Zellman, 1978). The more favourable attitudes toward teachers (except for males in the single-sex schools) and high school among the grade 10 students than the grade 12 students likely reflect a declining enthusiasm for school that occurs as the more advanced students begin to tire of the high school routine, to anticipate increasingly their post-secondary school pursuits, and to develop expectations of being treated more as young adults than as adolescents.

CONCLUSION

The results of this investigation indicate that students in coeducational schools possessed more favourable attitudes about their academic competencies, high school, teachers, and the type of institution (coeducational or single-sex) in which they were being educated. In showing differences in educational attitudes between coeducational and single-sex schools, our findings accord with a growing body of educational thinking and research that emphasizes the potentially profound effects of the schooling process on social outcomes—social reactions that are learned or altered as a consequence of exposure to the school environment (Bar-Tal, 1978). In fact, research on the psychological effects of school environments suggests that children from different schools may vary more in terms of social outcomes than in terms of scholastic performance (Minuchin, Biber, Shapiro, & Zimiles, 1969). Given the consistent evidence showing attitudinal differences between students in coeducational and single-sex schools and the in-

consistent evidence concerning differences in academic performance, it may very well prove to be the case that the primary area of concern should be the differential impact of coeducational and single-sex education on students' social outcomes.

NOTES

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² In our review of the literature, we uncovered over 30 arguments either for or against coeducation, the highest number being opposed to it.

³ With respect to grade level, the schools represented at grade 12 were not entirely the same as those at grade 10. Data from one all-male school were available for grade 10 students only; thus only three schools are represented in the grade 12 all-male sample. Also, data from one coeducational school were available only at the grade 10 level and from a second coeducational school only at the grade 12 level; thus, for the coeducational data, only three schools were the same at grades 10 and 12.

⁴ Through grade 10, Roman Catholic separate schools in Ontario were, at the time of this study, publicly funded. For grades 1 to 8 approximately a third of all Ontario students were enrolled in separate schools (Ministry of Education, 1980); after grade 8, approximately a third of separate school students enrolled in separate high schools. However, in urban areas the proportion tends to be much greater; in the four areas from which the present sample of schools came, the percentages were 46, 48, 69, and 73. Through grade 10, separate schools were categorized as publicly supported schools and were administered by local separate school boards. After grade 10, separate schools were classified as private, operating outside of the publicly supported system. However, the vast majority of students remain in the same schools throughout high school.

⁵ Missing information on some subjects produced slightly smaller degrees of freedom than those dictated by the overall sample size.

⁶ Approximately 17% of the sample assigned a rank to only one of the three school types (e.g., most of these students assigned a rank of 1 to coeducation and left the other school types blank). The data for these students were retained for the analyses, causing the degrees of freedom to vary among the analyses of the three school types.

⁷ There is some evidence that school grades are causally predominant over self-concept of academic ability (Calsyn & Kenny, 1977). Analysis of variance revealed no significant difference between the grade-point average of the coeducational school and single-sex school students ($p < .44$), thus suggesting that the school type difference in academic self-concept was not related to a difference in grades received.

⁸ A study by Nicholls (1967) is an exception in that single-sex school females favoured single-sex education, although the three other categories of students favoured coeducation.

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Vier Hypothesen in Bezug auf Unterschiede in der Einstellung zur Bildung bei Schülern koedukativer und nach Geschlecht getrennter Schulen wurden frühere Forschungsarbeiten entnommen, die sich auf die sozial-psychologische Umwelt von koedukativen und getrenntgeschlechtlichen Highschools bezogen. Diese Hypothesen besagten, daß—im Vergleich zu Schülern an getrenntgeschlechtlichen Schulen—Schüler koedukativer Schulen: (1) eine positivere Einstellung zu Lehrern; (2) positivere Vorstellungen von der eigenen Lernfähigkeit; (3) eine positivere Einstellung zur Schule und (4) eine stärkere Vorliebe für den Schultyp (koedukativ oder nach Geschlecht getrennt) haben, den sie besuchen. Die Teilnehmer an der Untersuchung waren 2.029 Schüler der 10. und 12. Klasse aus fünf koedukativen, vier rein weiblichen und vier rein männlichen Highschools. Die Schüler füllten einen Fragebogen aus, der auch Skalen einschloß, die sich auf diese Hypothesen bezogen. Die Ergebnisse untermauern die 2. und 4. Hypothese und—zum Teil—Hypothesen 1 und 3.

A base de investigaciones previas sobre ambientes sociales-psicológicos de escuelas secundarias coeducacionales y segregadas por sexo se derivaron cuatro hipótesis acerca de las diferencias en las actitudes hacia la educación de estudiantes de escuelas coeducacionales y segregadas. Estas hipótesis consistían en que, comparados con

estudiantes de escuelas segregadas, los estudiantes de escuelas coeducacionales tendrían (1) actitudes más positivas hacia los maestros, (2) un concepto más positivo hacia su propio desempeño académico, (3) una actitud más positiva hacia la secundaria, y (4) una mayor preferencia por el tipo de escuela (coeducacional o de sexo único) que atendían. Los participantes en la investigación incluyeron 2.029 estudiantes de grados 10 y 12 de cinco escuelas coeducacionales, de cuatro escuelas católicas de mujeres y cuatro de varones. Los estudiantes completaron un cuestionario que incluyó escalas de relevancia a cada una de las hipótesis. Los resultados ofrecieron respaldo a las hipótesis 2 y 4 así como respaldo parcial a las hipótesis 1 y 3.

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