A Boy's Secondary School Changes to Coeducation

Erica Clare Ryan
Flinders University *erica.ryan@cso.brokenbay.catholic.edu.au*

In this paper, factors that influence academic achievement and self-concept of Year 12 students in their final year of schooling at a Catholic co-educational school in Adelaide, Australia were investigated. The study hypothesised there were differences in attitudes and academic performance due to prior schooling experiences, sex, home experiences, peer influences and school policy and practices.

The Self Description Survey (SDQ111) and aggregate results from four Year 12 assessment points were used in order to collect data. The data were examined using the specific statistical approach of effect size and correlational analysis. A focus on differences between those students who had previously had single sex schooling from those who had coeducational experiences over a five-year period found that difference existed with the scales of the SDQ111, particularly the Religion, Physical Appearance, Parent, Opposite Sex and General scales. Similarly there were clear sex differences noted on some of the 13 scales of the SDQ111 favouring the boys on the majority of these scales. One other factor of interest involved Parent Occupation. Evidence found that the parent's level of occupation was significantly related to academic achievement.

Single-sex education, coeducation, self-concept, academic achievement, boys, Australia

INTRODUCTION

In recent decades, public attention has been directed both in Australia and overseas to the question of gender differences in education. Within Australia there have been growing concerns about the general restructuring of education, government involvement and spending. The growing numbers of students retained to Year 12 have led to pressure on the education system.

In the 1980s and 1990s, equitable access to education became key features of governmental policy that impacted on growth in school retention rates and greater access to higher education, for both males and females. With this change, specific programs were designed to increase participation of groups marginal to education such as females in the technologies and males within language courses. Inherent in these changes are discussions regarding the value of coeducational and single sex learning environments.

A renewed interest in discussion about educational arrangements for both boys and girls has led to widespread debate in the United States. This has produced recent initiatives particularly with regard to the implementation of single sex classes into coeducational systems and single sex schools changing to coeducation. Wellesley College for Research for Women (1992) stated that in the United States, single sex classes are illegal in public schools with change limited to single sex work groups within coeducational classes. Nevertheless, they report that there is a strong group in the United States that challenges the notion of coeducation as the prime mode of education.

The American Association of University Women (Wellesley College for Research for Women, 1992) stated that in 1997, the Californian Governor (USA) set aside five million dollars to establish ten experimental single sex classes on the sites of existing coeducational middle schools.

A recent publication by Sadker and Sadker (1994), titled, *Failing at Fairness: How America's Schools Cheat Girls*, reports that teachers spend more time disciplining boys in coeducational classes and much less time disciplining girls. Other studies reported that boys did better in competitive environments, while girls preferred smaller, cooperative settings. Sadker and Sadker argued that greater emphasis should be placed on improving coeducational classes so that boys and girls attracted equal attention.

Most primary education in Australia is coeducational, whereas at State level there exists a greater variation in secondary education. Traditionally independent and Catholic secondary schools are single sex (henceforth referred to as SS). However, recent changes have seen more schools in these systems become coeducational (henceforth known as Coed). Most government secondary schools are Coed except for some selective schools that are SS. Australian research reviewed by Gill (1988, p.47) into SS and Coed schooling issues reported that in general a Coed school environment was seen as more desirable and in keeping with an Australian context as the twenty-first century approached.

Important issues are raised in this study, namely, do the structures of single sex or coeducational schools and classrooms shape individuals' actions and influence individuals, achievement, subject selection and self-concept?

In Australia and elsewhere there has been a ground swell of public opinion about the role of females and males in society. The issues raised not only involve questions of leadership in the community, of equity in employment, of work roles, and of a level playing field in domesticity, but also include questions of gender roles in school and higher education. Teese et al. (1995) argued that the complexity of the issues involved was further intensified by consideration of factors such as subject choice and subject selection and perceptions associated with gender stereotypes. While subjects with the greatest vocational potential attracted boys, girls encountered a strongly segmented curriculum that weakened their competitive chances of entering certain courses at the tertiary level. Teese et al. (1995) added that, in particular, girls tended to choose subjects with less coherence such as Biology, Humanities, Business Studies and Person Development rather than mutually supporting subjects such as Mathematics, Physics and Chemistry. Furthermore, subject choice might account for gender differences in academic achievement. Thus, the role of school subjects both provided and selected by students in perpetuating gender differences also needs to be considered.

The school involved in the study, was a Coed Catholic R-12 school with students from Years 7-12 (Senior School) located on a separate campus in Adelaide, South Australia. The Senior School was established in 1967 as a boys' school. In 1971, coeducation was introduced in the Senior classes in Years 11 and 12 and the first girls from Year 12 to sit for their matriculation did so in the same year. Recently since 1996, coeducation was extended to include all classes from Grades R to12. In the first year, 1996, 90 girls and 391 boys were enrolled in the school, followed by 123 girls and 422 boys in 1997,170 girls and 429 boys in 1998 and 207 girls and 453 boys in 1999.

The impetus for the transition to Coed status was largely due to economic factors. However, other factors such as educational benefits of a coeducational setting, families wanting their children to attend one school and old scholars seeking a Jesuit education for their daughters contributed to the decision.

An important question arising in this study was to investigate whether students, male or female, coming into the school, from SS or Coed schools, accommodated to the school's climate. The key aspects that were taken into consideration in this study were not only the achievements of the students as assessed by Grade Point Average, Aggregate score, or the SACE examination performance but also the students' self-concept as assessed by the *Self Description Questionnaire* (Marsh, 1990) after four years in the Senior School.

First, the question was asked: Is there a significant difference between boys and girls at the terminal stage of their schooling, being Year 12? Secondly, there was the question: Did the Oldcomers differ significantly from the Newcomers? The Oldcomers were students who were enrolled at the school before or at the beginning of the change. The Newcomers enrolled in the second, third or fourth year of the change but were only classified as Newcomers for the particular year in which they first enrolled at the school.

The following research questions were advanced for this investigation,

1. Do girls respond more favourably to both the Verbal and Mathematics scales than the boys?
2. Do the boys respond more strongly to the Physical Ability, Physical Appearance and General Self-Concept scales than the girls?
3. Do the girls score at a higher level in achievement than the boys?
4. Are father's and mother's occupations related to the educational achievements of the students?
5. Do more years in coeducation in the school under survey lead to higher achievement and higher self-concept?
6. Is there a relationship between the processes operating within the school and the responses of the students with respect to achievement and self-concepts?

The Newcomers were examined further to see if their shortened time period at the school of one, two, three or four years distinguished them from the Oldcomers that had been at the school longer than four years in a Coed setting.

RESEARCH METHOD

Sample

In 1999, in the fourth year of transition from a SS to Coed school, the current Year 12 classes at the school had 89 enrolments with 65 males and 24 females. The number of girls from previous SS schools totalled 20 while the number from previous Coed schooling was four. The number of new boys from SS schools was 8 and, from Coed schools was 18. There were 39 boys who were enrolled at the school's Junior Campus at the time of transition from SS secondary schooling in Year 7 to Coed schooling in Year 8. Therefore the size of the sample was the 89 Year 12 students enrolled in 1999 with no losses arising from non-response to the *SDQ111* and a general questionnaire. Thus the complete population of a year group in a school was surveyed. There existed diverse socio-economic and cultural backgrounds in the Year 12 student group with a large representation of families from non-professional, middle class backgrounds. Figure 1 shows diagrammatically a simple model of the relationships between the predictor variables and achievement.

Variables Identified in this Study

1. Sex is identified in order to examine data for gender differences.
2. Home background is indicated by the father's and mother's occupations according to the six hierarchically ordered categories of the Broom, Jones and Zubrzycki (1968) scale.
3. Religion groups parents' religious affiliation according to either Catholic or other.
4. Type of schooling experienced over time is collected according to single sex or coeducation experienced by the student over a four year period.

5. Self–concept is based on the 13 scales as measured by the *Self Description Questionnaire* (Marsh, 1990).
6. Achievement involved data collected from the Grade Point Average (GPA) and the Aggregate (Agg) four times during the 1999 academic school year. Data from an external assessment was collected at the fourth and final time point.

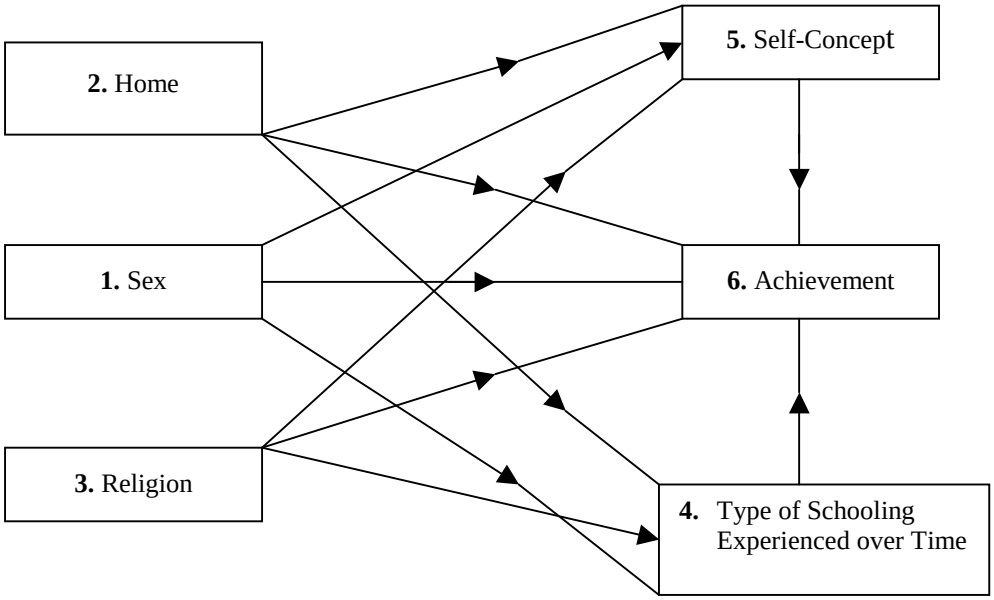

Figure 1. A Proposed Model of the Effects of the Variables

THE INSTRUMENTS USED IN THE STUDY

The SDQ 111 Self-Concept Questionnaire

In summary the *SDQ111* measures self-concept in global and specific areas for late adolescents and young adults. The *SDQ111* is a 136 item self-report questionnaire that measured self-concept using 13 scales which are grouped into three areas of Academic self-concept, Non-Academic self-concept, and a Global self-concept derived from the Rosenberg (1965, 1979) self-esteem scale as presented in Table 1. Users when interpreting the scores are encouraged to consider the specific scales because of their distinct nature rather than an overall or general self-concept.

Table 1. Grouping of the Scales of the *SDQ111*

Academic	Non–Academic	Global
Mathematics	Problem Solving	General - Self
Verbal	Physical Abilities	
General - Academic	Physical Appearance	
	Same Sex Relations	
	Opposite Sex Relations	
	Parent Relations	
	Spiritual Values/Religion	
	Honest/Trustworthiness	
	Emotional Stability	

The *Self Description Questionnaire 111* was administered to the Year 12 students during Term 3. The Questionnaire was self-explanatory for students at the Year 12 level and the instructions for the *SDQ111* were written on the cover page of each instrument. The students were invited but not required, to write their names on the response sheets. Students were further assured that by responding honestly, this would not be harmful to them and would be of positive value. The questionnaires were handed out in a prescribed order.

Father's Occupation (FOCC) and Mother's Occupation (MOCC) Data

A general questionnaire was administered at the time of student's enrolment at the school to the parents of the students and included details of their current occupation that were recorded on a school database. The recorded occupations of the fathers and mothers of the Year 12 students were assigned to six hierarchically ordered categories. These formed a six-point scale classified according to the ordered categories provided in *A Hierarchical Ordering of Sixteen Occupational Groups According to Occupational Prestige* (Broom, Jones and Zubrzycki, 1968). The codes and occupational titles were derived from a two-digit code developed from the Australian Census classification. The 16 occupational groups were assigned to the six hierarchically ordered categories that formed a six-point scale. Table 2 presents the scale values assigned to Father's Occupation (FOCC).

Table 2. Parent's Occupation Scale Values

Professional	6
Managerial	5
Clerical	4
Skilled	3
Semiskilled	2
Unskilled	1
Missing	0

Mother's Occupation (MOCC) was coded in the same way as for Father's Occupation; however, Home Duties were initially coded as 0. Missing data and Home Duties were subsequently recoded as 3.5. The number of responses in each of the categories of the Father's Occupation and the Mother's Occupation scales were recorded in Table 3.

Table 3. Frequencies and Percentages of Father's (FOCC) and Mother's Occupation (MOCC)

Value FOCC	Frequency	Per cent	Value MOCC	Frequency	Per cent
			Home Duties (3.5)	14	15.7
Unskilled (1)	22	24.7	Unskilled (0)	26	29.2
Semiskilled (2)	17	19.1	Semiskilled (2)	5	5.7
Skilled (3)	15	16.9	Skilled (3)	23	25.8
Clerical (4)	4	4.5	Clerical (4)	2	2.3
Managerial (5)	6	6.7	Managerial (5)	9	10.1
Professional (6)	3	3.4	Professional (6)	3	3.4
Inadequately Defined (3.5)	4	4.5	Inadequately Defined (3.5)	1	1.1
Missing (0)	18	20.2	Missing (0)	6	6.7
Total	89	100.0		89	100.0

Academic Achievement Data

During 1999, data were collected at four different times during the academic school year. The first three collection points at the end of each term relied on data collected internally within the school using methods of assessments based on the Senior Secondary Assessment Board of South Australia (SSABSA) with external assessment at the fourth and final point of collection. The Aggregate (Agg) was based on a score out of 100, while the Grade Point Average (GPA) was calculated to assess the overall performance of a student. The GPA was obtained by giving a score out of 20 for each of the subjects studied. These were added together and divided by the number of subjects. The result was a GPA score out of 20. The scores for the GPA and Agg data are not independent, that is, the higher achieving student is likely to obtain a high score on both measures with the Agg matching the GPA.

Oldcomers and Newcomers

The students currently in the school under survey were coded 1. These students were referred to as Oldcomers. Students who came to the school in a particular year were coded 0 and were referred to as Newcomers. These were recorded for enrolments at each year level, from Year 8 to Year 11. The Oldcomers were defined as those students enrolling at the school before or at the beginning of coeducation and the Newcomers were defined as those entering either the first, second, third or fourth year of change but only classified as Newcomers for the particular year in which they enrolled) were recorded for each year at the school.

ANALYSES

In these analyses, correlations and effect size differences (see Cohen, 1988) were calculated for boys' and girls' responses to the *SDQ111*. They were recorded in Table 4. Descriptive statistics of means and standard deviations provide information on the sex differences in the students' responses to the scales of the *SDQ111* that assessed their views in the 13 different areas of self-concept.

Table 4. Sex Differences between the Means, Standard Deviations (SD), Correlations, Effect Sizes and Significance on 13 Scales of the *SDQ111*

Scales	**Means**		**SD**		**Correlation**	**Effect**	**Sig**
	Boys	Girls	Boys	Girls		**Size**	p
Mathematics	37.5	39.5	14.5	14.9	-0.06	-0.12	0.6
Opposite Sex	47.4	45.4	12.5	11.6	0.07	0.14	0.5
Parent	46.4	43.5	10.5	11.3	0.12	*0.24*	0.3
Physical Ability	49.8	36.8	13.4	14.8	*0.39	**0.84**	*0.0
Physical Appearance	43.7	33.8	12.9	14.3	*0.32	**0.65**	*0.0
Problem Solving	38.5	35.2	8.7	6.4	0.18	*0.38*	0.1
Religion	42.0	46.6	17.2	15.3	-0.12	*-0.24*	0.3
Same sex	38.9	34.3	8.9	9.4	*0.22	*0.43*	*0.0
Verbal	46.5	45.8	10.5	9.6	0.03	0.06	0.8
Academic	43.0	40.0	11.7	10.3	0.12	*0.23*	0.3
Honesty	54.5	59.2	12.5	11.0	-0.17	*-0.24*	0.0
Emotion	43.9	37.6	12.1	13.2	*0.22	*0.44*	*0.0
General	60.2	50.7	14.1	18.2	*0.27	*0.55*	*0.0
Number	65	24	65	24	89	89	

Effect sizes			
	d < 0.2	trivial	(ordinary type)
	0.2 <d < 0.5	small	(italics type)
	0.5 <d < 0.8	medium	(bold type)
	0.8 <d	large	(bold type)

* statistical significance of correlations and effect sizes with p-values

Since boys are coded '1' and girls are coded '0' in the calculations of the correlations and effect sizes, a positive coefficient indicates the stronger attitudes of the boys and a negative coefficient indicates the stronger attitude of the girls.

Achievement Differences

Table 5 presents information regarding achievement collected at four different times throughout the academic school year in 1999. The means of the boys and the girls are very similar across the various data collection points during the 1999 academic school year with boys being slightly ahead of the girls but not significantly so. The spread of scores is consistent except in the cases of both girls and boys at the end of the school year with the girls' aggregate score (Agg4) and (GPA4) varying slightly more than the boys' aggregate score (Agg4) and (GPA4). With regard to academic achievement there is little difference between the means and the standard deviations of the boys and girls.

Table 5. Correlations and Effect Size Differences between boys and girls on Achievement as measured by Aggregate Score and Grade Point Average

Academic	Means		SD		Correlations	Effect	Significance
Achievement	Boys	Girls	Boys	Girls		**Size**	p
Aggregate1(AGG1)	78.0	77.9	10.0	9.9	0.006	0.01	0.9
Aggregate2(AGG2)	78.5	77.0	10.3	9.8	0.068	0.14	0.5
Aggregate3(AGG3)	78.8	78.1	10.0	10.2	0.033	0.06	0.8
Aggregate4(AGG4)	77.4	77.0	11.1	12.2	0.018	0.04	0.9
GradePointAverage1(GPA1)	15.7	15.6	1.9	2.0	0.013	0.03	0.9
GradePointAverage2(GPA2)	15.9	15.3	2.0	2.0	0.131	*0.26*	0.2
GradePointAverage3(GPA3)	15.8	15.6	2.0	2.0	0.063	0.13	0.6
GradePointAverage4(GPA4)	15.6	15.4	2.1	2.5	0.034	0.07	0.8
Number	65	24					

Effect sizes			
	d < 0.2	trivial	(ordinary type)
	0.2 <d < 0.5	small	(italics type)
	0.5 <d < 0.8	medium	(bold type)
	0.8 <d	large	(bold type)

* statistical significance of correlations and effect sizes with p-values

Generally there are negligible differences between the boys' and girls' academic results, which suggests that coeducation has not had any detrimental effects. However, change data would be needed to establish whether or not this suggestion is sound. It is noted that including sex as a variable with respect to differences in academic achievement in this analysis has confirmed the view that although the boys may be slightly ahead of the girls, there is largely equality between the sexes in their performance in the classrooms of the school. A further point to be made with respect to these results is the noticeably marginal difference between the girls and boys in academic achievement in contrast to some notable differences between the girls and boys on the *SDQ111* scales.

It was decided not to compare the Oldcomers with the Newcomers who came from SS schools or from Coed schools or to compare the Newcomers who were males with those who were females because the numbers were sometimes very small. Consequently the subsequent comparisons as assessed by effect size are restricted to Oldcomers versus Newcomers in order to examine the effects of the changing composition and experiences of the cohort. In interpreting the magnitudes and the directions of the effect sizes it is necessary to recall that (a) the Newcomers in 1995 (Year 8 group) were all boys; (b) the Newcomers in 1996 (Year 9 group) were largely girls; (c) the Newcomers in 1997 (Year 10 group) were largely girls; and the Newcomers in 1998 (Year 11 Group) involved both boys and girls with a small majority of girls. However, the composition of the Oldcomer group changes between the different comparisons.

Thus the table that follows with respect to Year 8, Year 9, Year 10 and Year 11, in effect, records the differences between those students who had longer periods within the school, when compared to those students who had shorter periods, namely Year 8 – 5 years, Year 9 – 4 years, Year 10 – 3 years, Year 11 – 2 years. Since the data were recorded at the end of 1999, all students had at least one year at the school.

Table 6 presents the effect size differences that occur over time in achievement at the Year 12 level. A negative effect size indicates that the Newcomers performed at a higher level while a positive effect size indicates that the Oldcomers perform at a higher level. All effect sizes recorded are positive. The only statistically significant difference in achievement over time at the school in this study is that those students who have been longer at the school up to Year 11 differ from those students who are at the school for a shorter period at Term 4, the last quarter of the year. These effects are indicated with an asterisk.

However, the achievement scores for Term 4 are obtained from the SACE results, while the remaining scores for Terms 1, 2 and 3 are internally assessed scores. Nevertheless, Table 6 shows

the pattern of results indicating that the students who are established in the school, obtain higher marks and grades assigned to them in both the internal assessment and the SACE examinations. This may be a consequence of (a) being familiar with the school's assessment procedures; (b) a 'halo' effect in which the student who is an Oldcomer is better known to the teachers who make the assessments; (c) working better in the classroom through greater accommodation to the school's work environment; or (d) already having a higher level of achievement prior to the beginning of the final year of schooling.

Table 6. Effect Size Differences in Year 12 Achievement over Time

Year of Entry	Agg1 (d)	Agg2 (d)	Agg3 (d)	Agg4 (d)	GPA1 (d)	GPA2 (d)	GPA3 (d)	GPA4 (d)
Year 8	*0.32*	*0.36*	*0.37*	*0.28*	*0.21*	*0.38*	*0.37*	*0.25*
Year 9	*0.20*	*0.22*	*0.29*	*0.26*	0.11	*0.27*	*0.32*	*0.27*
Year 10	0.19	*0.22*	*0.26*	*0.35*	0.07	*0.23*	*0.25*	*0.36*
Year 11	*0.25*	*0.25*	*0.24*	**0.46*	0.10	0.17	0.18	**0.43*

Effect sizes			
	d < 0.2	trivial	(ordinary type)
	0.2 <d < 0.5	small	(italics type)
	0.5 <d < 0.8	medium	(bold type)
	0.8 <d	large	(bold type)

In Table 7 the differences between the Oldcomers and Newcomers in their responses to the 13 scales of the *SDQ111* are shown in terms of effect sizes. Information is given for each intake group so that comparisons could be made over time to test whether there has been a shift in the relative views of the Newcomers with respect to the Oldcomers.

Table 7. Effect Size Difference of Oldcomers and Newcomers by Years of Entry and Attitudes by the SDQ111

Scale	Effect Size				
	Year 8	Year 9	Year 10	Year 11	Range
Mathematics	*0.08*	*0.03*	*-0.08*	-0.15	*-0.23*
Opposite Sex	*-0.07*	*0.09*	0.22	*0.33*	*+0.40*
Parent	*-0.13*	*0.10*	0.25	*0.28*	*+0.41*
Physical Ability	***0.50***	***0.71***	***0.58***	**0.51**	**0.21*
Physical Appearance	**0.62**	***0.53***	*0.41*	*0.27*	*-0.35*
Problem Solving	*0.42*	0.35	*0.42*	*0.47*	**0.12*
Religion	*-0.40*	-0.20	*-0.14*	0.08	*+0.48*
Same Sex	0.27	*0.46*	***0.53***	*0.26*	**0.27*
Verbal	0.20	*0.09*	0.26	*0.37*	**0.28*
Academic	*0.45*	*0.38*	***0.63***	***0.61**	**0.23*
Emotion	*0.45*	*0.43*	***0.73***	*0.39*	**0.34*
General	*0.19*	*0.43*	***0.54***	*0.31*	**0.35*
Honest	*-0.06*	*-0.06*	*0.06*	0.15	*+0.21*
Oldcomers (N)	39	58	70	78	
Newcomers (N)	19	12	8	11	

Negative sign (-) Newcomers more favourable
Positive sign (+) Oldcomers more favourable
* inconsistent pattern
+ increasing pattern
- decreasing pattern
Significant effect sizes are shown in bold

Effect sizes			
	d < 0.2	trivial	(ordinary type)
	0.2 <d < 0.5	small	(italics type)
	0.5 <d < 0.8	medium	(bold type)
	0.8 <d	large	(bold type)

Over time the effect size difference has varied more with the Religion, Physical Appearance, Parent, Opposite Sex and General scales as indicated not only by a change in sign but also by a change in magnitude of the coefficients given by the Range in the far right column in Table 7. In three of these cases, namely, Religion, Parent and Opposite Sex scales, the longer the students are

in the school under survey, the greater the difference. However, in the scale of Physical Appearance the reverse occurs with the effect size decreasing over time, while for the General scale there are marked fluctuations.

Influence of Home Background on Academic Achievement

In this study the data for parents' occupation was collected from the school databases and assigned according to six hierarchically ordered categories with the highest level of occupation scored 1 and the lowest level of occupation scored 6. Thus a negative correlation indicates that students from high occupational status homes performed better at school. Table 8 and Figure 2 show the correlations between Mother's and Father's Occupation and Grade Point Average (GPA). Thus Mother's and Father's Occupation would seem to influence the outcome of student achievement as measured by the GPA during Year 12 and shown in Table 8.

Table 8. Correlations and Effect Size By Mother's and Father's Occupation on Academic Achievement measured by the GPA

Variable	GPA1		GPA2		GPA3		GPA4	
	r	d	r	d	r	d	r	d
MOCC	-0.335	-0.71	-0.193	-0.39	-0.259	-0.54	-0.196	-0.40
FOCC	-0.144	-0.29	-0.227	-0.40	-0.301	-0.63	-0.247	-0.51

There were 7 per cent of data missing for MOCC and 20 per cent for FOCC. The largest categories of mothers identified were: unskilled (29%), skilled (26%) and home duties (16%) according to the occupational skill type scale. Whereas the largest categories of fathers identified were: unskilled (25%); followed by semiskilled (19%) and skilled (17%). It is worthwhile noting that the strongest relationship between Mother's Occupation and GPA is for GPA1. However, this changes over time with the influence of the Father's Occupation steadily increasing and the effect of the Mother's Occupation decreasing. A possible explanation may be that at the beginning of Year 12, higher status mothers are more involved and protective of the student's performance at school but, over the year the higher status fathers become increasingly involved. The school reinforces the involvement of each parent during Terms 2 and 3 by requesting that both parents are involved in discussions and interviews regarding academic achievement.

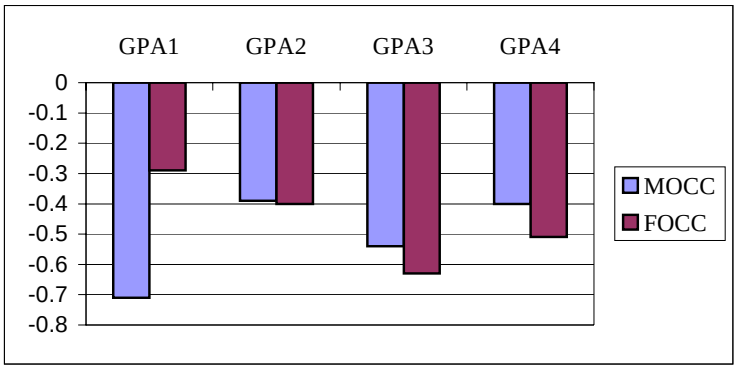

Figure 2. Effect Size by Mother's and Father's Occupation on Academic Achievement in the GPA

With these relatively strong correlations between parental occupation and student achievement, it would seem likely that some of the effects associated with the Oldcomer and Newcomer status of a student would be related to the occupational status of the students' parents. As a consequence some effects might involve the fact that higher status homes might be able to afford the fees for a student to spend all years of schooling, or at least a longer period, in the particular school under investigation.

DISCUSSION

Although this study was limited to an investigation of the academic achievement and self-concept of Year 12 students in their final year of schooling at a Catholic coeducation school in Adelaide, it documented such differences between the sexes in academic achievement and self-concept according to levels of year entry from the period 1995 to 1998. Differences were noted and examined according to relationships with schooling experiences, home experiences, peer influences and school policy and practices.

The results with regard to sex differences and self-concept in this study showed that the polarisation of Mathematics for boys, and girls for the Verbal scale, did not exist. Gender considerations yielded from the results of the *SDQ111* in Table 4 revealed that girls supported an emerging trend with slightly more favourable views of Mathematics while the boys held slightly more favourable views on the Verbal scales. The results of this study indicated a significant relationship between the sex of the student and the *SDQ111* scales of, Physical Ability, Physical Appearance, Same Sex, Emotion and General. In general the boys' views were stronger on the majority of the 13 scales. These findings supported research over the last 20 years confirming that certain scales on the *SDQ111* favoured girls; however, more favoured boys. Marsh (1989) added after testing his differential socialisation hypothesis using longitudinal structural equation models the results suggested that gender differences in these constructs were being reduced. A comprehensive report edited by Keeves (1992) analysed science achievement data collected in ten countries by the International Association for the Evaluation of Educational Achievement (IEA). In this report, Keeves and Kotte analysed Science achievement data collected in 10 countries and suggested caution should be observed when interpreting the effects of sex through attitudes and their influence on Science achievement. Conclusions drawn indicated that this is a complex matter with the sex of the student and attitudes requiring further investigation.

However, with regard to academic achievement the academic results at Year 12 did not support strong gender differences between the sexes. In fact the boys were only marginally ahead of the girls indicating very little difference between the sexes. Caution must also prevail before suggesting that these findings concurred with those of Marsh et al. (1988) and Smith (1994). Therefore, this study found that transition from SS to Coed schooling benefited both boys and girls with no measured academic disadvantages for students attending Coed schools for either sex group. Further data are needed in order to make comparisons between other schools.

With regard to differences between the Newcomers and Oldcomers and academic achievement, the results suggested that the longer the students were at the school in this study, the better the grades and marks obtained by them. As stated previously, this finding could be related to general and academic maturity. Again as with sex differences there were few differences noted in this study with regard to academic achievement between the Newcomers and the Oldcomers.

The pattern of results for the *SDQ111* provides a comparative view between the self-concept of the Oldcomers and the Newcomers. Over time the effect size difference varies more with the Religion, Physical Appearance, Parent, Opposite Sex and General scales. In particular, the longer a student is in the school, change occurs with the effect size increasing between the Newcomers and the Oldcomers with Religion, Parent and Opposite Sex scales with this affirming the positive effects of school policies. However, with the scale of Physical Appearance a different effect occurs with the effect size decreasing. A possible explanation for this may have been a developmental change in attitude for boys and the changing gender pattern with the increase in the number of girls during Years 9 and 10. Marked fluctuations for the General scale are worth examining further. This could be an area for further research. Marsh et al. (1988) cautions against generalising that self-concept is not increasingly differentiated with age, although he found that self-concept increases with age with boys having a modestly higher self-concept than girls.

Generally, from 1996 until 1999 the students' views in the Year 12 group on four of the scales, namely, Opposite Sex, Parent, Religion and Honest had become stronger over the years at the school in the study. These findings supported the view that the school might have positively influenced students' attitudes over time. The longer the student was at the school in the study, the stronger were their views on the scales of Problem Solving, Verbal, Opposite Sex, Parents, Honest and Mathematics when compared to the Newcomers.

One other variable in this study noted as being of importance was the influence of the home background. Teese et al. (1995) hypothesised that differences between boys and girls became more clearly differentiated as the parents were more socially disadvantaged. Evidence was found in this study that the parents' level of education made a significant contribution to achievement. At the beginning of the data points in 1995, the mother's influence appeared more marked. However, as the years progressed from 1995, 1996, 1997 to 1998, the influence of the father increased, supporting the view that parental values and attitudes might directly influence the attitudes and values of these students. It seemed that student achievement might be influenced by parental occupation. However, it might be of interest to further study what particular aspects of parental occupation such as income level, education or professional level or attitudes and aspirations relate to academic achievement.

REFERENCES

Broom, L., Jones, F.L. and Zubrzycki, J. (1968) Social stratification in Australia. In J.A. Jackson (ed.) *Social Stratification: Sociological Studies 1*. Cambridge: Cambridge University Press.

Cohen, J. (1988) *Statistical Power Analysis for the Behavioural Sciences*. Hillsdale NJ: L. Erlbaum.

Gill, J. (1988) *Which Way to School? A Review of the Evidence on the Single Sex Versus Co-education Debate and an Annotated Bibliography of the Research*. Canberra: Commonwealth Schools Commission.

Keeves, J.P. (ed.) (1992) *The IEA Study of Science 111: Changes in Science Education and Achievement 1970 to 1984*. Oxford: Pergamon Press.

Marsh, H. (1989) Sex differences in the development of verbal and mathematics constructs: The High School and Beyond Study. *American Educational Research Journal*, 26, 191-225.

Marsh, H. (1990) *Self Description Questionnaire III. SDQ III Manual.* Australia.

Marsh, H., Smith, I., Marsh, M. and Owens, L. (1988) The Transition from Single-Sex to Coeducational High Schools: Effects on Multiple Dimensions of Self -Concept and on Academic Achievement. *American Educational Research Journal*, 2, 237-269.

Rosenberg, M. (1965) *Society and the Adolescent Child.* Princton: Princton University Press.

Rosenberg, M. (1979) *Conceiving the Self.* New York: Basic Books.

Sadker, M. and Sadker, D. (1995) *Failing at Fairness: How our Schools Cheat Girls.* New York: Simon and Schuster.

Smith, I.D. (1994) *Project: Gender Differentiation: Gender Differences in Academic Achievement and Self-Concept in Coeducational and Single-Sex Schools*. Australian Research Council. [Online] http://alex.edfac.usyd.edu.au/Local/Resource/study1/coed.html

Teese, R., Davies, M., Charlton, M. and Polesel, J. (1995) *Who Wins at School? Boys and Girls in Australian Secondary Education.* Department of Education Policy and Management. University of Melbourne, Australia, 1-17.

Wellesley College Centre for Research on Women (1992) *How Schools Short-change Girls.* American Association of University Women Educational Foundation and the National Education Association, Wellesley.