

**Exploring Differential Achievement Between
Boys and Girls in High School**

A Thesis Submitted to the College of
Graduate Studies and Research
in Partial Fulfillment of the Requirements
for the Degree of Master of Education
in the
Department of Educational Psychology and
Special Education
University of Saskatchewan
Saskatoon, Saskatchewan

by

Andrée Nobert-Bennett

PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a graduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by Brian Noonan, Ph.D., or in his absence, by the Head of the Department of Educational Psychology and Special Education. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis.

Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Head of the Department of Educational Psychology and Special Education
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0X1

ABSTRACT

Educators, researchers and policy makers have taken notice, in recent years, of a trend whereby girls are attaining higher academic achievement than boys in most school grades and subjects, in many western nations. Further, this trend does not appear to diminish with age, with universities and colleges reporting that male students have lower attendance and program completion. Many theories outlining the possible reasons for the differential achievement have been put forth, but despite the many explanations and intervention strategies, gender differences in achievement persist.

The present research study was designed to explore potential sources of influence on girls' and boys' academic achievement. The five categories used as a framework for the research instruments were based on those outlined by Gambell and Hunter (1999) in their study of gender differences in literacy, that is, evaluative bias, home socialization, role and societal expectations, gender psychology and equity policy. These explanatory categories, derived from research concerning gender differences in literacy, were applied to achievement overall to explore whether they could shed light on the problem of gender differences in achievement at the high school level.

This study was based on three research questions: (a) What is the effect of gender, achievement level, and grade on each of the five explanatory categories?; (b) What is the nature and extent of the relationship between evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy?, and; (c) To what extent is there congruence between student and teacher perceptions of similar issues? The data provided by 36 teachers and 153 high school students from three western Canadian high schools were used to study these questions.

Results were analyzed using multivariate analyses and descriptive procedures. The multivariate analyses of the student data indicate that gender and grade produced no main or interaction effects, while achievement level produced a main effect (no interaction effects). Achievement level main effects were present in the evaluative bias, gender psychology and equity policy categories. There were no statistically significant effects for the categories of role and societal expectations and home socialization. Most of the statistically significant main effects involved the low achievement group, which was represented by a small number of participants ($n = 13$).

Relationships between explanatory categories were examined using Pearson's product-moment correlations. These results indicated that there were a number of statistically significant correlations between explanatory categories, some positive, some negative. In general, these correlations suggested that when students feel supported at home and at school, they also show a good school-student fit, and a perception of general equity within the school. The converse is also true, suggesting that while some students appear well adjusted at school, others appear to have a number of difficulties.

In exploring potential discrepancies between teacher and student perceptions, the teacher items that elicited a strong teacher agreement, where 80% or more teachers chose the same answer, were compared to related, though not necessarily parallel, student items. Follow-up univariate analyses of student items provided additional information on the perceptions of students. Most similar items showed general congruence between teacher and student perceptions, though there were some differences as well. These results suggest that low achieving students are not as clear as their classmates about how their grades are tabulated. Also, it appears that teachers perceive a decline in parental

involvement over students' development, whereas students perceive that their parents' involvement has remained fairly constant over time. On a more encouraging note, there were no group effects for gender or grade for any of the explanatory categories, with only achievement level showing a main effect for evaluative bias, gender psychology and equity policy items.

Overall, the results of this study suggest that although the five explanatory categories provide insight into potential areas of improvement in education, they do not appear to explain gender differences in achievement. The contributions of this model, and of this study, are discussed, as well as recommendations for future study. For example, future researchers may wish to explore the effect other factors such as motivational regulation, students' level of employment, extracurricular involvement and earning potential after high school. Nonetheless, future researchers may wish to strengthen the measurement properties of the instruments used in this study as well, in order to further test the null hypothesis through replication or other related studies.

ACKNOWLEDGEMENTS

I would like to thank Alan Yackulic, Ph.D., for starting me on this journey. His faith in me was an important first step in this endeavour. I would also like to give sincere thanks to Brian Noonan, Ph.D., for graciously accepting to continue the journey with me as my advisor and for helping me bring it to fruition. In addition, the wisdom offered by Fred Reekie, Ph.D., and Trevor Gambell, Ph.D., was gratefully appreciated, as were the insightful suggestions made by Pat Renihan, Ph.D. Finally, I would like to thank John McNamara, Ph.D. for chairing my defence.

TABLE OF CONTENTS

PERMISSION TO USE.....	I
ABSTRACT.....	II
ACKNOWLEDGMENTS.....	V
TABLE OF CONTENTS.....	VI
LIST OF TABLES	IX
LIST OF FIGURES.....	X
CHAPTER ONE	1
INTRODUCTION	1
Need for the Study.....	1
Explaining Differential Achievement.....	6
Purpose of the Study.....	10
Research Questions	12
Question 1.0.....	12
Question 1.1.....	12
Question 1.2.....	12
Question 1.3.....	12
Limitations of the Study	12
Participants.....	13
Measures.....	14
Summary.....	16
CHAPTER TWO	17
LITERATURE REVIEW	17
Differential Achievement	17
Evidence of Differential Achievement.....	19
International and National Findings.....	19
Saskatchewan Context.....	22
Addressing Differential Achievement.....	25
Five Explanatory Categories for Differential Achievement.....	30
Evaluative Bias.....	31
Home Socialization	36
Role and Societal Expectations.....	40
Gender Psychology.....	44
Equity Policy.....	48
Summary.....	52
CHAPTER THREE	54
METHODOLOGY	54
Research Design.....	54

Sample Selection	54
Instruments	55
Data Collection	60
Data Analysis	60
Research Approval	61
Summary	62
CHAPTER FOUR.....	63
RESULTS	63
Measurement Properties of the Instruments	64
Results of Student Differential Achievement	64
Effect of Grade, Gender, and Achievement Level	64
Evaluative Bias	70
Gender Psychology	74
Equity Policy	77
Relationships Among Explanatory Categories	79
Teacher and Student Perceptions	81
Evaluative Bias	82
Home Socialization	85
Role and Societal Expectations	87
Gender Psychology	87
Equity Policy	89
Summary	90
CHAPTER FIVE.....	92
DISCUSSION AND INTERPRETATION OF RESULTS	92
Grade, Gender and Achievement Level	92
Evaluative Bias	92
Gender Psychology	93
Equity Policy	99
Explanatory Categories	102
Differences in Perception	105
CHAPTER SIX	118
CONCLUSIONS AND IMPLICATIONS	118
Contributions of the Present Research	123
Recommendations for Future Research	125
Reflections	131
REFERENCES.....	134
APPENDIX A.....	142
APPENDIX B.....	144
APPENDIX C.....	145

APPENDIX D.....	154
APPENDIX E	164
APPENDIX F	165

LIST OF TABLES

Table 1. Student Instrument Items by Theme.....	57
Table 2. Teacher Instrument Items by Theme.....	59
Table 3. Demographic Characteristics of Students (n = 151)	65
Table 4. Student Mean Score and Standard Deviation of Explanatory Categories by Grade	67
Table 5. Student Mean Score and Standard Deviation of Explanatory Categories by Achievement Level	67
Table 6. Student Mean Score and Standard Deviation of Explanatory Categories by Gender	68
Table 7. Effect of Grade, Gender and Achievement Level on Student Responses ($p = .05$)	69
Table 8. Effect of Achievement Level on Student Evaluative Bias Items	71
Table 9. Effect of Achievement Level on Student Gender Psychology Items.....	74
Table 10. Effect of Achievement Level on Student Equity Policy Items	77
Table 11. Mean Total Score and Standard Deviation for Explanatory Categories.....	80
Table 12. Correlations Among Explanatory Categories (n = 153)	80
Table 13. Related Teacher and Student Items in the Evaluative Bias Category	83
Table 14. Related Teacher and Student Items in the Home Socialization Category.....	86
Table 15. Related Teacher and Student Items in Role and Societal Expectations Category	87
Table 16. Related Teacher and Student Items in the Gender Psychology Category.....	88
Table 17. Related Teacher and Student Item in the Equity Policy Category.....	90

LIST OF FIGURES

Figure 1. University of Saskatchewan admission data by college, 1991-2000.....	24
--	----

CHAPTER ONE

Introduction

Differential achievement patterns between boys and girls has been documented in many industrialized nations, including Canada and within the province of Saskatchewan. Educators have recently begun to seriously question this differential school achievement, as it appears in a number of different assessment measures, across a number of grades. As well, it appears that there are differential outcomes according to gender at the post-secondary level, both in Saskatchewan and elsewhere. These patterns have attracted the attention of a number of educational researchers, who have suggested various explanations for the discrepant achievement patterns between boys and girls, as well as a number of ways of intervening in order to redress the situation. These explanations vary widely, as do the approaches, which include both small-scale classroom interventions and larger-scale educational reforms. The various findings about boys' and girls' differential achievement, as well as potential explanatory models and interventions, are discussed in this section. This discussion leads to the statement of the research questions of the present study.

Need for the Study

In recent years, academic achievement reports have repeatedly indicated that girls are outperforming boys academically in most subjects, at most grade levels. Reading and literacy appear particularly problematic for boys compared to girls (Gambell & Hunter, 1999; OECD, 2000; ERIC Clearinghouse, 2001). For example, the Council of Ministers of Education, Canada (CMEC, 1999) reports that in 1998, 16-year-old females

outperformed males, with highly significant differences between them. In fact, differences on pan-Canadian reading and writing assessments reached nearly 22 percentage points in reading and 11 percentage points for writing. Gambell and Hunter (1999) also observe that “females outperform males in all areas of reading and writing at the elementary, middle, and secondary levels, and this literacy gap does not narrow or close with age” (p.1). An Australian study showed that only boys from higher socio-economic areas outperformed some groups of girls (Franklin, 1993, as reported in Gilbert & Gilbert, 1998).

The Calgary Herald (1999) reports that an “analysis of student performance over six years shows girls generally record higher Grade 12 marks than boys in all subjects” (p. 1). The Government of Alberta (1999) states that “females generally had slightly higher school-awarded marks than males [on 1999 provincial diploma examinations]. Average scores were higher for females on 8 out of the 11 courses and almost equal to those of males in the remaining 3 courses” (p. 1). Bouchard and St-Amant (2000) observe that in Quebec, boys are retained more frequently than girls at the elementary level, and fewer boys than girls complete high school. *Saskatchewan Education Indicators: Kindergarten to Grade 12* reports that in all of the Grade 12 subjects, “provincial average marks of female students were higher than those of male students, consistent with findings from previous years” (Government of Saskatchewan, 2000, p. 54).

Similarly, CMEC conducted a School Achievement Indicators Program (SAIP) in 1998, which tested 13- and 16-year-olds across Canada. They found that:

A number of the indicators now suggest that there is a need to monitor the progress of male students in some areas. Not only did male secondary students

have weaker reading and writing scores on SAIP than their female counterparts, but data on high school completion also show that male students are less likely to graduate (CMEC, 1999, p.1).

Further, “it is evident that people with less than high school education have more trouble finding and keeping jobs than those with higher levels of educational attainment” (CMEC, 1999 p.90). The Australian Council of Educational Research echoes this concern:

The consequences of poor literacy include an increased likelihood of leaving school early, relatively poor access to a university education, the prospect of higher levels of longer term unemployment, and a greater chance of being [in] lower paid, less skilled jobs (as cited in Gilbert & Gilbert, 1998, p. 12).

These elementary and high school patterns are also evident across much of Canada, and in a large number of other industrialized nations (Organisation for Economic Cooperation and Development, OECD, 2002; Bouchard & St-Amant, 2000). A recent report states that “in all the G-7 countries except France and Germany, the ratio [of female high school graduates] was at least six points higher than for men” (CMEC, 1999, Chapter 4, p. 91). These findings are important because they reflect not only boys’ achievement levels, but also the health of our education systems, as it could reasonably be expected that an institution with mandatory participation until age 16 would yield equitable results for all its learners.

The long-term effects of differential school success touch not only on employability immediately after high school, but also during and after the post-secondary years. The CMEC (1999) reports that “more women than men graduate from university

[which is] consistent with the data on educational attainment ... and with the data ... on high school completion rates” (p. 93). In Saskatchewan, this pattern has also been observed:

In 1999, ... the percentage of females (63 percent) planning to pursue post-secondary education within the next 12 months was higher than the percentage of males (49 percent). Fifteen percent of all students intended to work immediately after high school. The percentage of males planning to do so (19 percent) was higher than the percentage of females (10 percent) (Government of Saskatchewan, 2000, p.92).

The report goes on to state that:

In 1999, almost 80 percent of Aboriginal Grade 12 female students and just over half their male counterparts planned to attend a post-secondary institution some time in the future. Thirty percent of Aboriginal Grade 12 male students intended to work immediately following high school (Government of Saskatchewan, 2000, p.92).

This report leads one to wonder about a possible link between male students’ educational and occupational goals, and their schooling experience. It remains to be seen whether male learners’ goals upon grade 12 graduation are sustained, and whether their lower educational goals relative to their female counterparts translate into lower earning potential in the future, an issue that is discussed later.

As suggested by CMEC (1999), high school completion rates are related to educational attainment, often measured by years of post-secondary schooling. Thus, if more female than male students complete high school, with a higher overall academic

average, then it can reasonably be expected that they may also have a higher participation rate compared to their male counterparts in post-secondary institutions. At the University of Saskatchewan, women outnumber men in all colleges except Engineering, and they do so with a higher overall average. Even the historically male-dominated colleges of Physical Education, now named Kinesiology, and Agriculture have had more female students since the 1998/99 and 1997/98 academic years, respectively (University Studies Group, 1996 & 2000). *The Maclean's Guide to Canadian Universities and Colleges 2001* reports similar patterns in other Canadian post-secondary institutions: 46 out of 52 universities reporting the gender distribution of the student population indicated that female students outnumber male students, with two universities reporting an even gender distribution. Only three universities and one university college across the country reported having a student body with a greater number of male students (see Appendix A). Colleges, technology institutes and trade schools are also generally attended by more women than men. Although the details of post-secondary attendance patterns are discussed in more detail later, it appears that differential achievement between boys and girls at the elementary and high school levels has the potential for long-term consequences.

To be sure, many researchers and feminists are expressing concern that the current time, energy, and school-level financial resources expended trying to “manage” boys, will detract educators’ and policy makers’ attention away from educational equity for girls (for an example, see Reed, 1999). However, many researchers involved in the study of boys’ success at school appear conscious of this potential trap. Blair and Sanford

(1999), for example, assert that the discussion about boys is not intended to disregard gender inequities for girls, but to also bring to the fore issues related to boys.

It is reasonable to expect that mandatory participation in an institution that spans across childhood would yield equitable results for all its learners, not merely half of them. It is also evident that the current concern in educational circles for boys' achievement is important in many parts of the world, including Canada and more specifically, Saskatchewan. Despite the apparent agreement as to the existence of the achievement discrepancies, there has not yet been uniform agreement concerning the underlying explanations, nor a co-ordinated plan as to how to redress the situation.

Explaining Differential Achievement

The nature of any discussions or policy changes in education concerning boys' and girls' achievement often depends on explanations offered for the differential achievement. These explanations range from the biological, which appear most controversial in the literature on boys' achievement and school success, to the sociological. Others range from narrow, such as boys' achievement, to broader, such as the way masculinities are constructed within the school culture. Depending on the view taken of the underlying explanations for the differential achievement between boys and girls, different classroom- or school-based interventions have been suggested or designed to address perceived weaknesses.

The perspective that boys are innately and inevitably "hard-wired" a distinct, masculine way generally corresponds to the biological perspective. In this framework, the differential achievement between boys and girls has led to suggestions that activities less focused on "feminine" strengths such as language would be more beneficial to boys

(Reed, 1999). The popular press has suggested that classroom activities that appeal to boys' fundamental "maleness", such as action stories, heroics, or content reflecting their interest in sports or technology, might better meet their learning needs (Pollack, 1998).

This perspective has been highly criticized. Gilbert and Gilbert (1998), for example, argue that the scientific community's understanding of the human brain, and where any biologically-based sex differences may originate, is as yet too elementary to be the basis of arguments regarding broader concepts such as masculinity and femininity. They further observe that "quite unfounded claims can be widely accepted in the popular imagination, diverting attention away from positive action and towards a resigned conformity" (p. 45). In the context of education, it can be dangerous to attribute the unknown causes of the differential achievement between boys and girls simply to "brain differences", because this attribution, as unproven as it is, may encourage passive acceptance of boys' and girls' issues at school, rather than continuing to look for potential areas of intervention.

In contrast, sociological explanations of lower male achievement address social interactions, as well as the "relational character" of masculinity and femininity (Gilbert & Gilbert, 1998). In other words, masculinity can only be studied in relation to femininity. Some sociologically-oriented writers have suggested that social changes, such as increasing rates of male unemployment or unclear sex-roles brought about by the feminist movement, may partly be at the root of comparatively limited school success for boys (Reed, 1999; Skelton, 2001).

Educators, policy-makers and researchers who have focused specifically on the issue of differential achievement have suggested such things as increasing boys' exposure

to positive male role models, seating plans based on mixed-sex pairings so boys can be exposed to girls' more compliant behaviour and/or academic strategies, mentoring, target setting, and praise and reward (Skelton, 2001). Skelton (2001) argues that these strategies are based on a notion of "masculinity" rather than "masculinities", and that it perceives boys as victims of social restrictions in need of liberating experiences. In contrast, Skelton (2001) describes a more political approach to gender studies whereby the way to address gender inequities in schools is to address the power dynamics and interrelationships between people and the institution (school). She explains the link between this approach and school success:

The implication here is that identity is simply a reflection of the dynamics of an institution; so boys' and girls' identities at school are shaped solely as a result of the gendered practices of the school. This interpretation of how social identities are constructed leads to the conclusion that, in schools, all that is required is for pupils and teachers to recognize the 'false consciousness' shaping their behaviours and that will be sufficient to bring about change in gendered identities" (p. 55).

Where boys' lower academic achievement is perceived to be due to a lack of identification with school, or to an unwritten code of conduct among themselves, this argument has relevance to how schools can address the subtext of boys' school experience.

Single-sex schooling has also resurfaced in the discussion of differential achievement (Bouchard & St-Amant, 2000; Keith et al., 1998. Blair & Sanford, 1999). Researchers in Western Europe and the United States have attempted to address boys'

lower academic achievement by proposing the old model of single-sex classrooms or programs as a way to better serve boys (Bouchard & St-Amant, 2000, p.281). However, much of the single-sex (SS) education literature has concerned itself primarily with the benefits for girls, and the research that does exist about males is generally based on elementary schooling (Mael, 1998). Overall, there are many arguments in the literature in favour of SS schooling, ranging from the suggestion that SS schools allow for the differential maturation between boys and girls, to the idea that boys will be less distracted by girls in SS schools (see Mael, 1998). However, the actual benefits of SS schools are far from conclusive and associated studies usually represent problems of selection bias (Datnow, Hubbard & Conchas, 2001; Mael, 1998; LePore & Warren, 1996; Haag, 2000). Also, these studies tend not to deal specifically with academic achievement, ranging instead from studies of school climate (see Mael, 1998), to the effectiveness of military or disciplinarian-style schools (Mael, 1998; Blair & Sanford, 1999).

Besides single-sex schooling, more traditional schools have also attempted to address gender equity concerns, often by writing equity policies around non-discrimination. Although such policies are essential as a basis from which school administrators and teachers can work, they may be insufficient. Salisbury and Jackson (1996) worry that:

The unofficial curriculum – under the desk knowledge acted out along the corridor, behind the bike sheds, in the toilets, and all that is muttered and whispered in classrooms behind cupped hands – is often more important in the making of boys and masculinities than the explicit courses teachers provide.

That's why a conventional, equal opportunities school policy that only focuses on

the explicit curriculum is missing out on the really powerful, gendering forces in schools (p. 11).

If indeed a part of boys' relatively lower achievement is intertwined with their concept of themselves as masculine, or of school as a feminine domain, then educators and policy-makers will have an interest in looking at more than a simple rewriting of their equity policy.

Although the evidence pointing to the gap in achievement is plentiful, the explanation of why there exists a gender gap in achievement, or how to address it, is far from unanimous. Nonetheless, as can be seen from the above discussion, there are recurring themes in the literature. These tend to center on biological explanations, sociological forces in general, pressures to conform specific to the school environment, the general structure of education, and equity policies. Gambell and Hunter (1999) suggest a five-category model to explain the gender gap in literacy. They describe this model as complementary rather than mutually exclusive. The five explanatory categories they propose are: "(a) evaluative bias, (b) home socialization, (c) role and societal expectations, (d) male psychology, and (e) equity policy" (p. 10). Given the striking parallel between these categories related to the differential achievement in literacy, and the natural categories of arguments found in the literature on differential achievement in general, it is possible, if not likely, that these categories can form an important anchor for further research on the problem of achievement for boys and girls.

Purpose of the Study

There is no shortage of literature in the educational domain on differential achievement patterns between boys and girls, and it consistently indicates that boys score

lower on classroom-based tasks in many subjects and most grade levels than their female classmates. Various research studies and discussion in the literature in education, gender studies, sociology and psychology have lent support to the explanatory possibilities suggested by Gambell and Hunter (1999). In order for educators and policy-makers to address achievement concerns about boys, it seems necessary to research the applicability and power of these explanations.

The purpose of the study was to investigate the possible explanations for the differences in achievement between boys and girls at the secondary school level, and to examine the extent to which the five explanatory possibilities outlined by Gambell and Hunter (1999) are determinants in school achievement. In other words, "How do the five possible explanatory categories identified by Gambell & Hunter apply to the differential achievement between boys and girls in urban Saskatchewan secondary schools?" Further, would certain factors prove more influential than others? Finally, the researcher wished to informally explore the possibility of discrepancies between students' and teachers' perceptions of academic achievement. It was not the purpose of the study to evaluate teacher performance in any way; rather, it was to investigate how students perceive the relationship between their academic engagement and the way education is delivered and evaluated, and the messages they receive at home and in the community at large. An informal exploration of the possibility of differences in perception between teachers and students was also included in this study.

Research Questions

Question 1.0

How do the five possible explanatory categories identified by Gambell & Hunter apply to the differential achievement between boys and girls in urban Saskatchewan secondary schools?

In order to answer this umbrella research question, the researcher also formulated three specific sub-questions.

Question 1.1

What is the effect of gender, achievement level, and grade on each of the five explanatory categories?

Question 1.2

What is the nature and extent of the relationship among evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy?

Question 1.3

To what extent is there congruence between student and teacher perceptions of similar issues?

Because of the exploratory nature of this study, the extent to which each of these questions can be answered varied. Nonetheless, the overall purpose of this study was to explore the source and degree of influence on girls' and boys' academic achievement.

Limitations of the Study

There are several limitations to the scope of this study. These include elements in the selection of both teacher and student participants, and in the construction of the research instruments.

Participants

The researcher chose random selection as a means of selecting student participants in the understanding that the student sample represents the student population as a whole. However, this study was conducted within one school board, in one urban center of western Canada. Thus, the data do not necessarily represent the situation or students' views in other parts of the country, because of the demographic and cultural characteristics of western Canada.

In addition to demographic variables, the distribution of the actual participants in this study suggests that this random selection was significantly altered by either the parental consent process, the students' interest in participating, the schools' logistical concerns, or an interaction of these factors. Ninety-eight of the 152 respondents who reported their academic average claimed to have an average of over 75% (high achievement group), 41 said their average was between 61-75% (medium achievement group), and 13 reported having an academic average of less than 60% (low achievement group). Thus, although the results of the majority of respondents may represent the views of high academic achievers, they cannot be assumed to represent those of the student population as whole. In particular, the group of students achieving an overall average of less than 60% for academic subjects were represented by a small number of students (n = 13).

In addition, one of the schools had a very low student participation rate (n = 9). The researcher opted not to include these data in the analysis due to inconsistencies in procedure and low participation rate.

As well, only 36 teachers across the four schools chose to complete the questionnaire. This low participation rate precludes generalizations based on the questionnaire results. Nonetheless, the exploratory nature of this study permitted a descriptive look at the teacher responses; and the data were used as a source of ideas for future research.

Measures

The format of the student and teacher instruments reflected the five categories of explanations identified by Gambell and Hunter (1999) in relation to gender differences in literacy – evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy. The items in each of the categories were constructed based on theories underpinning each of the categories. For example, the items on home socialization were constructed based on the four parenting styles described by Maccoby (1992), which vary according to their levels of parental responsiveness or demandingness. Thus, the items in this section correspond to the latter two characteristics¹.

However, because no standardized instruments currently exist for students or teachers based on these explanatory factors, the instruments used in this study were constructed by the present researcher. A Likert-type design was chosen for the student instruments because “Likert scales are commonly used in educational and behavioral research. They allow for assessing differences in degree or intensity on a trait and are less difficult to construct than some other kinds of scales” (Mason & Bramble, 1997, p.309). In addition, the researcher was interested in students’ subjective responses to items

¹ The theories underlying each of the categories are further described in Chapter Three.

concerning various sources of influences in their lives, and the degree to which they agreed or disagreed with certain statements.

Rather than constructing a Likert-type scale for the teacher questionnaires, the researcher opted for a forced-judgement format, in the hope of reducing the potential for respondents to answer based on social desirability. However, based on the comments on the teacher questionnaires, it appears that many teachers were very uncomfortable with the forced judgement format of items dealing with gender differences. This could either reflect the fact that they truly perceived the traits in question to be unrelated to gender, or because identifying gender differences ran stronger counter to their training and perspective as educators. The high number of non-responses in the second half of the questionnaire led to only the first half being used for analysis.

Although the measures used in this study were well founded in theory based on the gender gap in literacy, this theoretical background was applied to academic achievement as a whole in this study. While literacy skills likely influence academic achievement as a whole, the factors underlying the development of these literacy skills may apply differently to overall achievement.

Further, the research instruments in this study were not constructed using methods such as the Thurstone design or standardized scaling procedures. This made the present instruments more experimental than standardized scales. Thus, in the present study, response patterns on the teacher questionnaire, as well as comparisons in responses between teachers and students, could only be analysed and reported descriptively.

Summary

There is no shortage of evidence that female students are achieving higher academically than male students, in a number of grades and subject areas, and on different types of assessment. The challenge for educators and policymakers has been to explain the reasons for this differential achievement, and then to propose suitable intervention strategies. Explanations have varied from the biological to the psychological, and interventions have run the gamut from classroom strategies in conventional classrooms to single-sex schooling.

The purpose of the present study was to investigate the possible explanations for the differences in achievement between boys and girls at the secondary level in an urban Saskatchewan setting. To collect data, two instruments were designed, based on the five explanatory categories defined by Gambell and Hunter (1999) – evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy. These categories were used as the basis for both teacher and student instruments, although these two instruments differ in design. In addition to this difference in design, potential selection biases and the lack of empirical testing of the instruments themselves present limitations to the study.

CHAPTER TWO

Literature Review

There are a large number of reports in many industrialized nations, including Canada, indicating that girls are outperforming boys in many subject areas and grade levels. This pattern has attracted the attention of educators, researchers, and policymakers alike, such that the phenomenon is sometimes referred to as “the boy question” in popular culture. However, despite the agreement about the existence of a differential achievement pattern based on gender, there is far less agreement about the underlying causes. Further, a variety of intervention approaches have been suggested, and these can vary even within an explanatory theory. In this section, the various areas of research in the area of differential achievement, the explanatory theories about the causes of the pattern, as well as the models proposed for intervention, will be reviewed.

Differential Achievement

In recent years, educators have noticed a steady trend whereby girls are achieving higher academic standards than boys on classroom-based grades in many subjects at most grade levels (for examples, see Government of Alberta, 1999; Bouchard & St-Amant, 2000; Government of Saskatchewan, 2000; CMEC, 1999). These classroom-based grades are generally calculated using a variety of assessment measures, such as grades on exams and assignments, as well as participation and/or effort marks, and girls appear to typically outperform boys on this type of assessment. In contrast, standardized assessments, where all students in a particular grade in a particular region are given the same assessment

instrument, have yielded more inconclusive results, with boys sometimes outscoring girls, depending on the assessment (Hamilton, 1998; Porter, 1999; Abu-Hilal, 2000).

Bouchard and St-Amant (2000) observe that “in the province of Quebec, for example, boys are retained more frequently than girls in the primary grades, and fewer boys than girls complete high school. Female students now constitute a majority in universities” (p.281). Elementary and high school patterns are evident across much of Canada, and in a large number of other industrialized nations as well (Organisation for Economic Cooperation and Development, OECD, 2002; Bouchard & St-Amant, 2000). The Council for Ministers of Education, Canada (CMEC) found that “in all the G-7 countries except France and Germany, the ratio [of female high school graduates] was at least six points higher than for men” (CMEC, 1999, Chapter 4, p. 91), indicating that differential achievement is an international phenomenon.

Many researchers and feminists have expressed concern that this new focus on male students’ academic achievement will detract educators’ and policy makers’ attention from ongoing concerns about educational and occupational opportunities for girls (for an example, see Reed, 1999). Blair and Sanford (1999), however, fittingly state that the discussion about boys “is not to disregard the seriousness of the gender inequities in schools for girls, but rather to recognize that there may well be just as serious issues for boys” (p. 10). Although Blair and Sanford (1999) are referring more specifically to boys’ weaker achievement in literacy, it is relevant to extend this statement to other areas showing pronounced gender discrepancies. From a wider perspective, the discussions about both girls’ and boys’ achievement patterns and educational opportunities have led to “a growing recognition of the gendered nature of schools, the social construction of

this construct “gender”, and the implications for a deeper understanding of gender for equity of outcomes” (Blair & Sanford, 1999, p. 3).

In order to properly assess any potential areas of intervention for educators and policy-makers, it is important to sift through the evidence of differential achievement. This serves to clarify both the nature of the problem, as well the more specific sources of difficulty in the education system or in society’s way of socializing both male and female students.

Evidence of Differential Achievement

Research in the area of differential achievement has been conducted not only in Canada by provincial governments, but also by international organizations in a number of industrialized nations. By and large, their findings confirm the existence of differential achievement in many nations, in both literacy and numeracy, and this difference in achievement typically favours female students.

International and National Findings

OECD authored a research project on the state of education entitled the Programme for International Student Achievement (PISA), which it describes as “a collaborative effort, bringing together scientific expertise from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests” (OECD, 2002, p. 3). The PISA assessments, consisting of paper-and-pencil tests given to almost 17 million 15-year olds in 32 countries, were used to measure students’ knowledge and skills in relation to real-life challenges rather than only specific book knowledge (OECD, 2002, p. 10). The findings are both interesting and somewhat surprising:

Policy-makers have, historically, given considerable priority to issues of gender equity in education, with particular attention to disadvantages faced by girls and women. PISA's results point to the success of many countries' efforts, but also to a growing problem for males, particularly in reading literacy....This difference is not small (OECD, 2000, "Different results by gender").

In fact, both international bodies such as OECD, and national organisations, such as CMEC, are calling for changes in policy with regard to gender differences in achievement. The PISA 2000 Executive Summary reports that "some countries provide a learning environment or broader context that benefits both genders equally. By contrast, the enduring differences in other countries, and the widespread disadvantage now faced by many young males in reading literacy, require serious policy attention" (OECD, 2000, "Different results by gender"). CMEC, when commenting on results of pan-Canadian assessments, comments that, "lower performance in reading and writing of francophone minorities and of male students suggests that both these groups need particular attention" (CMEC, 1999, p.75). They also state that "a higher percentage of females than males graduate from high school, and more females complete postsecondary education" (CMEC, 1999, p. 75).

In addition to these large-scale international projects, researchers in individual nations have also produced important literature related to the gender gap in achievement. Researchers from the United Kingdom, New Zealand and Australia, in particular, have advanced the body of knowledge on the differential patterns of achievement (Gorard & Rees, 1999), on social interpretations of the data (Delmont, 2000) and on approaches such as single-sex versus coeducational schooling (Harker, 2000).

To be sure, the academic achievement patterns of male and female students are not identical across all subject areas. Reading and literacy appear particularly problematic for boys, (Gambell & Hunter, 1999; OECD, 2000; ERIC Clearinghouse, 2001). In fact, CMEC (1999) reports that in 1998, on pan-Canadian reading and writing assessments, females outperformed males, with the differences reaching “close to 22 *percentage points for reading and 11 percentage points for writing* among 16-year-olds”, (italics added, p. 81). Also, “significantly more females than males demonstrated advanced reading and writing skills” (p. 81).

More specifically, it appears as though classroom-based grades produce more gender differences in favour of females than standardized tests (Hamilton, 1998; Porter, 1999; Abu-Hilal, 2000; ERIC Clearinghouse, 2001). However, other studies suggest that even on standardized testing, in traditionally male-dominated areas such as mathematics, there are some gender differences in favour of female students. In her study of gender differences in mathematics performance, Porter (1999) assessed 1172 public school students, enrolled in Grades 1 through 10, in a low-income county in the state of Georgia. She used the Iowa Test of Basic Skills for Grades 1 through 8, and the Tests of Achievement and Proficiency for Grades 9 and 10. She reported that “in all grades, except the second, the girls performed higher than the males” (p. 12). Such gender differences, observed outside of the Canadian context, have been noticed closer to home as well.

In *The Maclean's Guide to Canadian Universities and Colleges 2001*, 46 out of 52 universities reporting the gender distribution of the student population indicate that female students outnumber male students; in two universities, the population is evenly

split between the genders. This leaves only Royal Roads, Carleton and Waterloo Universities, as well as the Royal Military College, with a greater number of male students. In colleges, technology institutes and trade schools, the demographic data are only slightly more encouraging. In 65 out of 82 colleges where the gender split is reported, women outnumber men. In four colleges, the numbers are even, again leaving a very small percentage of colleges (16%) with a greater male student population (see Appendix A). Given that in 2000, Canada's population, aged 15 to 19, was almost evenly split between the genders, with 51.4% of the population represented by males and 48.6% represented by females (Statistics Canada, 2001), there may be cause for concern in the field of education across Canada, including within the province of Saskatchewan.

Saskatchewan Context

Saskatchewan Education (2000) produced a comprehensive document overviewing its education system, entitled *The Saskatchewan Education Indicators: Kindergarten to Grade 12*. In all of the twelve Grade 12 subjects reported, "provincial average marks of female students were higher than those of male students, consistent with findings from previous years" (Government of Saskatchewan, 2000, p. 54). Interestingly, females also had higher enrolment in all courses except Physics 30, where they nonetheless demonstrated higher academic achievement than boys.

Similarly, Yackulic and Noonan (2001, unpublished) found in their longitudinal study that the average of all Grade 12 marks for their sample of Saskatchewan students was 66.83% for males and 75.17% for females. Although this 8.34% difference is large in itself, male students' averages also have a far greater spread than female students' averages. To illustrate, 50% of girls have an average better than 75.17%, whereas only

24% of boys do. Further, girls' admission average at the University of Saskatchewan is at 82.8% - that average was attained by 16% of female students in the Yackulic and Noonan study (2001, unpublished). Only 8.97% of boys achieved that average, with their University of Saskatchewan admission average coming in lower, at 80.3%. Still, only 12.9% of boys achieved this lower average.

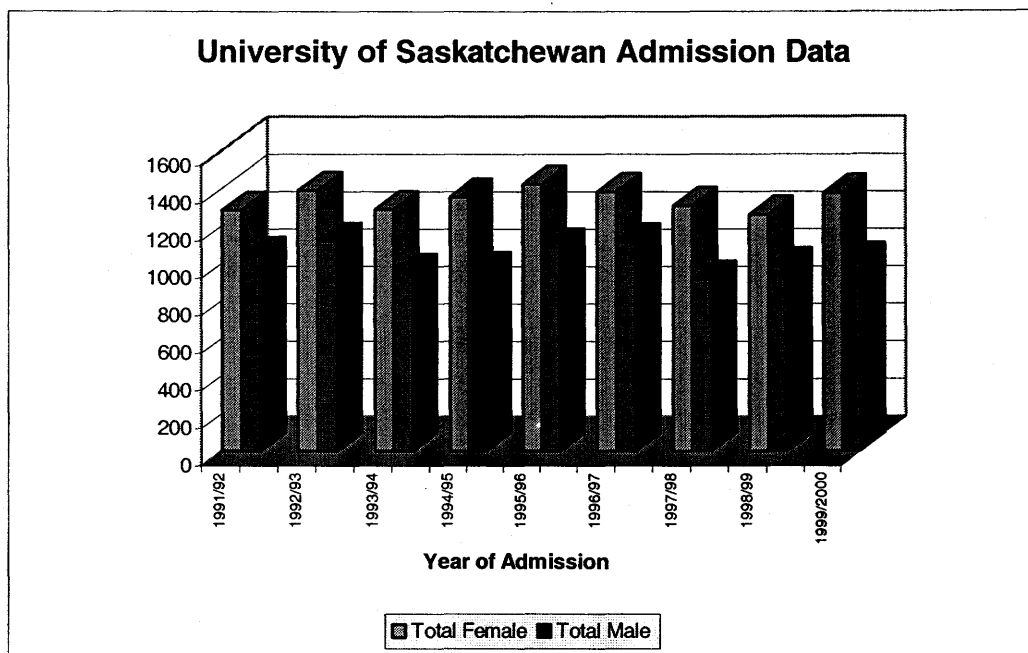
Saskatchewan Education's 1997 study of the mathematics proficiency levels across the province also reflected some of the same gender differences. For example, on these provincial performance-based mathematics exams, "only one-third of Grade 8 males had *Adequate* or *Proficient* communication achievement" compared to almost 54% of females (italics in original, Saskatchewan Education, 1997, p. 42). Although this gender gap closes somewhat by Grade 11, it still reflects a 10.2% decrement for boys relative to girls on the same item.

The following year (1998), Saskatchewan Education assessed oral language arts skills. The assessment consisted of a group discussion and of a multiple-choice test, and was given to students across the province in Grades 5, 8, and 11. On all aspects of group discussion, the "all female" and "majority female" groups performed better than average, whereas the "all male" and "majority male" groups achieved lower than average. Similarly, "for all grades and types of questions [on the multiple choice exam], the overall performance of females was higher than that of males" (Saskatchewan Education, 1998, p. 29).

Another important area of discussion stems from the observation that the differential achievement pattern between boys and girls appears to have consequences beyond high school. At the University of Saskatchewan, the overall number of female

first-year, first-time direct entry students has exceeded that of male students since at least 1991/92 (see Figure 1). Their academic averages upon admission have also been higher than their male counterparts' averages. Since the 1999/2000 academic year, women outnumber men in all colleges except Engineering. Even the historically male-dominated colleges of Physical Education (now Kinesiology) and Agriculture have had more female students since the 1998/99 and 1997/98 academic years, respectively (University Studies Group, 1996 & 2000, p.5.2). In other words, even with the allowance for male students to enter university with lower academic averages than female students', the latter outnumber the former in almost all of University of Saskatchewan's colleges. In addition, once in university, 16% of female students and an even larger percentage of male students, 22%, do not continue into their second year of university (University Studies Group, 1997).

Figure 1. University of Saskatchewan admission data by college, 1991-2000.



Fortunately, the issue of differential achievement between boys and girls has opened up discussion among educators and policy makers about how to address the issue, and as such, different ways of both conceptualizing and delivering education have been considered.

Addressing Differential Achievement

Although the question of differential achievement between male and female students is far from being solved, there have nonetheless been some discussions and attempts at addressing the issue. The nature of the attempts or suggestions often depends on the explanation offered for the differential achievement. For example, Reed (1999) argues that “popularised explanations for boys’ perceived failure often include the notion that by nature, boys and girls are different and bring with them different individual aptitudes and orientations to the learning environment” (p. 99). Such psychological explanations have led to suggestions that “predominant classroom practices favour the reflective and language-rich approach to learning of girls and seriously disadvantage boys” (Reed, 1999, p. 99).

In contrast, sociological explanations of lower male achievement address social relations, and also point out the impact of social changes. In Britain, for example, “increasing male unemployment and particularly high rates of unemployment among black and working-class young men are used to explain boys’ disaffection with schooling and young men’s oppositional stances (Wilkinson, 1995; Morris, 1996, as cited in Reed, 1999, p. 101). Further, Reed (1999) suggests that it is widely accepted as fact that boys consider it socially undesirable to succeed academically.

Addressing potential educational inequities for boys based on sociological explanations engenders different approaches. Reed (1999) summarizes various approaches, such as establishing a mentoring program whereby males accompany business people to work, in order to gain a reality-based sense of work ethic. Other suggestions include a compulsory period in the cadet corps, curfews for delinquent youth, and home-school contracts (Reed, 1999). However, these approaches appear to address difficult behaviours and delinquency more than the fit between schools' predominant ways of delivering education and boys' perceived place in society.

Other approaches may be more universally appealing, such as hiring more male primary school teachers, displaying male role models reading books, widening the conception of 'reading' to include materials more frequently chosen by boys, and/or continuing to increase the use of information technology in the classroom (Reed, 1999, p. 102), most of which can be integrated into conventional classrooms. Beyond high school, CMEC (1999) suggests exploring the "benefits of programs designed to help males who have dropped out complete high school at a later point in their lives" (p. 90). However, such post-secondary programs are outside the scope of this paper, as they target students after they have already left high school.

Aside from the approaches discussed above, which for the most part can be integrated into typical classrooms, single-sex schooling has also resurfaced (Bouchard & St-Amant, 2000; Keith et. al, 1998). With regards to boys' lower academic achievement, "researchers in France, the United Kingdom, and the United States have addressed the issue mostly by questioning coeducation in the schools. The old model of single-sex

classrooms or programs was given a new life on the assumption that coeducation is shortchanging boys” (Bouchard & St-Amant, 2000, p.281)².

Unfortunately, much of the research on single-sex (SS) research has concerned itself primarily with the benefits for girls, who are still perceived by many to be dominated by males in classroom discussion, or thwarted in their mathematics and science achievement (LePore & Warren, 1996). What research there is on males is generally based on elementary schooling (Mael, 1998). Overall, however, SS advocates have put forth many arguments in favor of SS schooling. Mael (1998) summarizes the arguments by various authors: (a) coeducational (CE) schools do not allow for the differential maturation between boys and girls; (b) boys are inevitably distracted by female students in CE schools, thereby incurring frustration and wasted energy; (c) males from disadvantaged backgrounds and those greatly needing positive male role models do not thrive in CE schools, typically dominated by female teachers; and (d) SS schools facilitate male bonding and character development (for references, see Mael, 1998, p. 105).

To further complicate the issue, the actual benefits of SS schools are far from conclusive. First of all, most of the research on single gender schools has been conducted in either private or Catholic schools (Mael, 1998), both of which are far more likely to provide single-gender classes than are public schools. This poses a problem of selection bias likely associated with the profile of the students who attend those schools (Datnow, Hubbard & Conchas, 2001; Mael, 1998; LePore & Warren, 1996; Haag, 2000). This selection bias may then permit these schools to “be more advantageous, either academically or socially, than coeducational schools” (LePore & Warren, 1996, p. 5).

² In this paper, the terms single-sex and single-gender will be used interchangeably

Secondly, most of the research on single sex schools has focused on girls or women (Mael, 1998; LePore & Warren, 1996; Blair & Sanford, 1999; Haag, 2000). Third, not all studies on SS versus CE schools deal specifically with academic achievement. For example, Schneider & Coutts (1982) studied the *climate* of SS and CE schools, using descriptors such as “gregarious, friendly, pleasurable”, rather than measuring the achievement of the students (in Mael, 1998, p. 114). Fourth, it appears that the SS male schools actually studied have largely been military or disciplinarian-style schools, designed to help socialize delinquent or behaviourally difficult boys (Mael, 1998; Blair & Sanford, 1999), or schools based on athletic programs such as hockey (Blair & Sanford, 1999). Finally, “studies that have found positive achievement outcomes attributable to the single-sex environment have all dealt with single-sex schools rather than classes” (Haag, 2000, p. 1), leaving the area of single-sex classes within more traditional schools relatively unexplored.

On a smaller scale, Saskatchewan Education assessed the students across the province on their listening and speaking skills (language arts) in 1998, as part of their Provincial Learning Assessment Plan (PLAP). Students were assigned to three or four-member groups to prepare for group presentations, with participation, active listening and respect for conversational peers as the criteria. In Grade 11, the ‘all female’ and ‘majority female’ groups achieved higher than average results in all aspects of group discussion, and the ‘all male’ and ‘majority male’ groups achieved below average in all aspects (Saskatchewan Education, 1998). The results were very similar in Grades 5 and 8. Although these groups were conducted within CE schools and had a specific purpose,

they did not appear beneficial for boys. Thus, it remains unclear whether SS group work for different purposes would contribute to equitable achievement opportunities for boys.

Weaving its way into many of these problems is the added “confusion between what students favor and what students may actually find more beneficial” when self-reporting their views on the issue of SS or CE schooling (Mael, 1998, p. 120). This potential reticence on the part of students and even parents and educators, to distinguish between their preference and their perception of the benefits of SS or CE schools likely reflects the social and political implications of favoring either all-girl or all-boy schools. For example, Mael (1998) cites findings by McGough (1991) that “for some, SS schools for females are valued for promoting equality, whereas SS schools for males are viewed as promoting inequality” (p. 120). Thus, any research that has been done in the area of SS schools for boys, as sparse as it is, is often marred by social, political, or logistical constraints.

However, one research project in particular, conducted by Bryk, Lee and Holland (1993), appears to have addressed some of the aforementioned difficulties with regard to the selection bias inherent in SS Catholic schools. After controlling for students’ social backgrounds, academic curriculum tracks, and school social contexts, they found that boys in the SS schools scored higher on reading, mathematics, and writing achievement tests in their sophomore years, and they scored higher on mathematics achievement tests in their senior years. Girls in SS schools scored higher on reading achievement tests in their senior years, and between their sophomore and senior years, they demonstrated large increases in their reading and science achievement test scores (reported in LePore & Warren, 1996). However, even with the variable controls, it is unclear whether these

results would be reproduced in typical non-denominational public schools. Also, despite in-group improvements demonstrated by both genders in different areas, it remains unclear whether inter-group gender differences would still persist.

Whatever the type of school, results from an action-research project on writing policy and creating single gender schools suggest that “in both coeducational and single-sex schools, gender equity must be an explicit goal of educators for it to be realized. Most importantly, the goal of gender equity must be accompanied by well-informed practice” (Datnow et. al, 2001. p. 202). Such practice, while inspired by the *evidence* of gender effects for both male and female students on different areas of academic achievement, must also be informed by strong theoretical constructs regarding the potential *explanations* for these gender effects. As there are many related theoretical constructs, some type of categorization is useful.

The five categories of explanations proposed by Gambell and Hunter (1999) in relation to male students’ weaker literacy skills, will be studied more in-depth as a starting point for the gender differences evident in other areas of school achievement as well.

Five Explanatory Categories for Differential Achievement

Despite the agreement that there is indeed a new and possibly worrisome trend in education, where boys score consistently lower than girls on wide-scale assessments, the theories as to why this might be occurring are varied and wide of scope. However, Gambell and Hunter (1999) have proposed a tentative framework of five categories of explanations to explain males’ lower achievement in reading and writing, namely: (a) evaluative bias, (b) home socialization, (c) role and societal expectations, (d) gender

(male) psychology³, and (e) equity policy. Within each of these areas, there are theories, as well as experimental studies, which may contribute to educators', parents', and policy makers' understanding of the influences on today's students. This understanding can serve to inform future recommendations and policy changes that may serve to address all matters of differential achievement based on gender. Following is a brief overview of each of the five categories of explanations.

Evaluative Bias

Evaluative bias refers specifically to the way in which student evaluations, such as tests, exams, and performance evaluations, are designed and graded. The potential that gender gaps in achievement may be due to evaluative bias is particularly interesting. If boys' school achievement is lower than girls' because of a systematic bias in favour of the latter, then it might be argued that the education system is inequitable for half of its learners. It should be noted that if there is a structural bias in the way education as a whole is delivered to boys, then the evaluation that results, whether biased in and of itself, will not accurately represent boys' potential. Therefore, the question of bias has far-reaching implications.

Various studies have suggested that boys and girls perform differently depending on the assessment instrument. As described earlier, gender differences are often more pronounced on classroom-based grades than on standardized tests (Hamilton, 1998; Porter, 1999; Abu-Hilal, 2000; ERIC Clearinghouse, 2001). In Saskatchewan, the current assessment structure may inadvertently be perpetuating these differences:

³ Although Gambell and Hunter (1999) refer to this explanatory category as "male psychology", the term "gender psychology" is used in this paper.

Students' final marks in Grade 12 are determined in one of two ways. About three-quarters of students' marks are set entirely by the classroom teacher.... The other one-quarter of students' marks include both classroom teacher mark submissions and final provincial examinations (Government of Saskatchewan, 2000, p.54).

Thus, Grade 12 final grades may often be based on a measure that reflects consistent gender differences in favour of female students.

Snyder (2000) studied the relationship between learning styles and academic achievement of high school students, with attention given to gender differences. She suggested combining learning style theory with multiple intelligences theory in order to provide teachers with practical suggestions that will benefit students. As such, her study explored students' perceptions of their learning style, based on the categories of auditory, visual, tactile/kinesthetic, and analytical/global learners, as well as their stronger areas of intelligence, such as linguistic, logical, spatial, bodily/kinesthetic, musical, interpersonal, and intrapersonal (Snyder, 2000, p. 13). She found:

...significant gender differences regarding academic achievement and categories of the instrument. The female students were stronger on [survey items of] intrapersonal, linguistic, musical, prefers working alone, visual, interpersonal, self-motivated, prefers quiet, GPA, analytical, and persistence. The male students were stronger on bodily/kinesthetic, logical, spatial, and working with others (p. 16).

These results suggest that teaching and evaluation practices that predominantly require reflection, individual work, analytical thought, or linguistic ability would benefit

female students, whereas tasks and assessments requiring actions and movement, problem-solving, spatial content and group work might benefit boys. This finding about boys' strength in group work appears to contradict the finding on Saskatchewan Education's (1998) provincial assessment of listening and speaking, where boys scored lower on all aspects of group work, namely participation, active listening and respect for conversational peers. It is apparent, then, that any comparisons between studies on group work must be consistent in relation to the definition, goals, and assessment criteria used for "group work".

Hamilton (1998) studied the effect of different types of assessment more directly in her comparison of male and female high school students' performance on multiple choice (MC) or constructed response (CR) science achievement tests. She found that the CR tests produced a stronger male advantage than the MC test, but that "the MC and CR items exhibiting the largest gender differences tended to involve visual or spatial content and called on application of experiences acquired outside of school" (p. 191). These types of items favoured male students. In other words, boys achieve better on assessments where they can capitalize on strengths such as visual and spatial reasoning, or apply the knowledge they have acquired through their out-of-school experiences.

Other researchers' studies on girls' and boys' performance on assessments have shown a stronger male performance on multiple choice tests. For example, Ramos and Lambating (1993) posit that males' higher comfort with risk-taking favours them over girls in multiple-choice test situations (as reported in Porter, 1999). For example, they may be less daunted by unfamiliar choices than girls, thus better able to choose what they think is the best answer, rather than the most familiar one.

Whatever the assessment instrument, the assessor's goals must be taken into consideration before the test is actually constructed. As mentioned above, teachers may want to rectify a perceived gender bias in their classrooms, but "fair", "equitable", "equal", and "neutral" assessments are not identical concepts. For example, Hamilton appears to favour equitable assessments, including items related to outside knowledge and tapping into visual and spatial strengths. Bell (2001), on the other hand, appears to favour neutral assessments: "there are some curricular areas, such as electrical circuits or earth/space topics, where it might be impossible to construct items for which male candidates had not had more relevant experience given current attitudes and preferences" (p. 485). Therefore, educators involved in test construction must carefully consider both the objectives, and the intended and unintended effects of their assessment tools. Obviously, the question of evaluative bias is not easily addressed, and has far-reaching implications for both policy and practice.

Within Canada, a number of provincial studies have also produced differential results based on gender. The 1999 provincial diploma examination results from Alberta indicate that "females had slightly higher school awarded-marks [sic] than males", but that "there were very few differences between the average scores of males and females in the diploma examinations" (Government of Alberta, 1999, p.1). The 2001 results are similar: "gender explains more variation in school-awarded scores than in diploma examination scores. For some courses, this difference is many times larger for school-awarded scores than diploma examination scores" (Government of Alberta, 2001, "Discussion"). In other words, standardized testing does not yield the gender differences in favour of girls that are evident in school-awarded marks.

In British Columbia, recent school achievement results indicate that girls' achievement is consistently superior to that of their male counterparts. In this regard, the Fraser Institute comments that the "difference is so pervasive as to suggest that there is a structural bias in favour of girls in the design and practice of school-based assessments" (as cited in *The Calgary Herald*, 1999, p.1). Gambell and Hunter (1999), however, caution that "sex differences are omnipresent [in literacy assessments in Saskatchewan] and difficult to explain on the basis only of assessment or sampling biases, research biases, or scoring anomalies" (p. 11), suggesting that boys' lower achievement is likely not a product of evaluative bias alone.

Obviously, it is relevant to explore what constitutes fair assessment in order to establish what may be biased. In fact, a Canadian committee, the Joint Advisory Committee (1993), was formed at the national level, in order to formulate principles concerning fair educational assessments. It is comprised of members of 10 educational and psychological associations, and it published a document entitled, *Principles for Fair Student Assessment Practices for Education in Canada*. In it, "a set of principles and related guidelines generally accepted by professional organizations as indicative of fair assessment practice within the Canadian educational context", are delineated (p. 2). Although the authors state that the principles are neither exhaustive nor mandatory, they guide professionals who endorse them toward fair and equitable assessments of students.

With regard to classroom assessments, the Joint Advisory Committee bases its assessment themes around the conceptual framework provided in *Standards for Teacher Competence in Educational Assessment of Students (1990)*: (a) developing and choosing methods for assessment; (b) collecting assessment information; (c) judging and scoring

student performance; (d) summarizing and interpreting results; and (e) reporting assessment findings (p. 3). It is important to explore whether classroom assessments generally conform to the principles outlined in each of the above areas, and whether certain areas are perceived by students to impact negatively on their learning. Thus, school stakeholders might be better equipped to address potential evaluative biases.

Whatever the assessment tools used by teachers, “the decision concerning what types of items to include and exclude must rest on a careful analysis of the purposes of the test and the likelihood of various consequences arising from its use, *both intended and unintended* (italics added, Hamilton, 1998, p. 193).

Home Socialization

The sources of influence on students’ achievement cannot always originate strictly in curriculum delivery or evaluative practices. For example, “children’s behaviours, and life and school successes, are shaped by experiences at home, at school, and in the community” (Government of Saskatchewan, 2000, p. 14). In the area of literacy, the 1985 International Association for the Evaluation of Educational Achievement (IEA) study of written composition reports that “teacher and school characteristics accounted for less than 7% of the variance in student writing performance, regardless of age, in participating countries, whereas home characteristics such as parental educational levels, frequency of family discussion, the number of books in homes, and years of planned further study accounted for up to 22% of variance in writing performance” (Purves, 1992, as reported in Gambell and Hunter, 1999, p. 11).

Keith, Keith, Quirk, Sperduto, Santillo & Killings (1998) examined home socialization effects in a longitudinal study on the effects of parent involvement on high

school grades. They found that “parent involvement has a large and significant effect on students’ grade point average in tenth grade [...and that] the same model of influences holds true across gender” (p. 335). In other words, the same parental influences, including aspirations for their children and communication with their children about school and school activities, impact on boys’ and girls’ achievement in similar fashion. It follows, then, that “interventions designed to improve PI [parental involvement], if effective, should lead to equal improvement in the grades of both girls and boys” (Keith et al., 1998, p. 351). Similarly, Schneider and Coleman (1993) argue that “parental involvement in education is increasingly viewed as a way to improve students’ educational performance” (in Muller, 1998, p. 336). However, the researchers also note that parents are actually more involved with girls than boys (Keith et al., 1998) and that parental involvement with male students was more likely to diminish with age, whereas involvement with female students remained more constant over time (Baker, 1987 in Muller, 1998). These findings indicate a potential area for educators to address, though Muller (1998) cautions that parental involvement likely has limitations in relation to its effect on students’ school performance.

In addition to level of parental involvement, sociologists have long argued that the style of parental involvement often differs depending on the gender of the child. For example, it is a commonplace assumption that many parents encourage exploration and risk-taking in their sons, whereas with their daughters they might emphasize social skills. OECD found that at the global level, student achievement (especially in reading literacy) was positively associated with parental socioeconomic status (OECD, 2000, “The importance of family background”), with possession of items associated with “classical

culture” such as artwork and literature, being a particularly strong predictor. While OECD makes no reference to gender, it raises the question as to whether boys’ exposure to such cultural items is equal to girls’, and whether parental reactions to their sons’ and daughters’ responses to such items is the same. With the effects of having classical culture in the home being stronger for reading literacy than for mathematical and scientific literacy, further research relating to the effect of boys’ and girls’ exposure to classical culture on their academic achievement is needed.

While it is unknown whether exposure to classical culture has any bearing on differential literacy achievement between boys and girls, it does seem that some aspects of literacy may be perceived by these two groups of students as a gendered activity. To illustrate, Gambell and Hunter (1999) observe that “historically, literacy has been considered a female activity, associated in the preschool years with mothers reading to their children...” (p. 11), and that the gender gap favoring females in literacy does not narrow during the school years.

It is well known that certain family characteristics and home socialization factors have an influence on students’ academic achievement. One indication of home-related influences is that of parenting styles:

...successful socialization of children involves not only bringing about their outward conformity to parental directives, but also enabling them to become self-regulating, and motivating them so that they become willing to cooperate with parental socialization efforts (Maccoby, 1992).

In her review of socialization studies, Maccoby (1992) describes Baumrind’s research on three important parenting styles. The first is authoritarian parenting, plotted as high

demandingness and lower responsiveness, and which describes directive parenting and clearly-stated rules. The second is nonrestrictive or permissive parenting, characterized by low demandingness but fairly high responsiveness, and finally, there is authoritative parenting, which is high in both responsiveness and demandingness, and which is generally assertive without being intrusive. Baumrind found that “compared to the children of either authoritarian or permissive parents, young children of authoritative parents were more mature and competent” (in Maccoby, 1992, p. 177). Maccoby (1992) also underlines the fact that a fourth parenting style is now apparent, that of disengaged parenting, characterized by low demandingness and low involvement, and which “is more likely to be found with older children” (p. 178). The importance of looking at parenting styles in relation to students’ school success is well summarized by

Saskatchewan Education:

Data from the National Longitudinal Survey of Children and Youth (NLSCY) indicated that poor parenting practices are strongly associated with the relationship and behavioural problems in children. Poor parenting practices appear to be a better predictor of these problems than living in single-parent, teen-parent and lower-income families (Saskatchewan Education, 2000, p. 14).

If parents adopt different parenting styles with their sons and daughters, thereby either positively or negatively affecting these students’ academic achievement, educators might be well advised to explore these effects. However, it must also be acknowledged that “schools can do many things but not rebuild society [sic] (of which they are part) singlehandedly” (Gambell, 2000). As well, any effort to study home socialization effects must take into account the society in which families live. Collins, Maccoby, Steinberg,

Hertherington and Bornstein (2000) describe the relationship between the home and other parts of society: “families are seen as important influences on children, the effect of which can be understood only in light of the simultaneous influence of social spheres such as *peer groups and schools*” (p. 226, italics added). They note the importance of Bronfenbrenner’s ecological perspective on human development (p. 227) because it emphasizes the dynamic interplay between various sources of social influence in a child’s life. Thus, although home socialization factors may partially explain differential achievement between boys and girls, they are likely not the sole sources of influence.

Role and Societal Expectations

Home socialization is difficult to measure in isolation from the many social and economic forces influencing family and student choices and behaviours. As pointed out by Gambell and Hunter (1999), “the home socialization explanation might be a microversion of a larger, macro-socialization explanation” (p. 11). Consequently, any study of socialization effects on student achievement is more complete when role and societal expectations outside of the home are taken into consideration as well.

Collins et al. (2000) state that home, school and peer influences represent the three dominant microsystems in a child’s life according to Bronfenbrenner’s ecological model. These microsystems consist of the activities, roles and interpersonal relations occurring in the three arenas of home, school and peer settings (Thomas, 2000). These three predominant microsystems provide data points that can be used to investigate influences on students’ academic achievement. Given that home influences are explored in more depth in the “home socialization” section of the present survey, the explanatory

category of role and societal expectations can focus on the two other microsystems, school and peer settings.

A potential source of influence on peer and school activities, roles, and interpersonal relationships is that of gender stereotypes, which are a type of societal expectation. Golombok (1994) defines stereotypes as “organized sets of beliefs about characteristics of all members of a particular group. A *gender stereotype*, then, is defined as a set of beliefs about what it means to be female or male” (italics in original, p. 17). She argues that the male stereotype seems more rigid than the female stereotype (p. 21).

Porter (1999), concerned about the underrepresentation of women in mathematics and science, argues that this pattern can be traced back to a gender gap favouring boys in these areas during the school years. She presents a number of arguments supporting her thesis that girls continue to face social and perhaps biological barriers with regards to mathematics and science. However, in her assessment of students in a Southwest Georgia school district enrolled in Grades 1 through 10 using the Iowa Test of Basic Skills and the Tests of Achievement and Proficiency, Porter found that girls outperformed boys in all grade levels except the second. She comments that, “there is not a genetic or biological difference in genders to allot for a difference in mathematics achievement or performance. So, any previously reported differences could be learned or could be developed through societal stereotypes” (Porter, 1999, p. 12). If girls’ achievement can be thwarted by societal stereotypes, it is plausible that similar forces may be at play in boys’ lower achievement in other areas.

However, the nature of these societal forces may be different for boys and girls. In gender stereotype literature, it is generally posited that girls have traditionally been

submitted to “stereotypes attributed to feminine identities such as docility and passivity, and these give them an edge in school: more self-discipline in class, greater respect for authority, and more hours invested in study and homework.” (Bouchard & St-Amant, 2000, p. 281). However, Bouchard and St-Amant (2000) found in their study that, in fact, there is “greater agreement by boys to masculine stereotypes (88%) than girls to feminine ones (44%)”, suggesting that, in fact, boys show more conformity to gender stereotypes than girls (p. 282).

However, the male gender stereotype may in fact be suppressing boys’ full academic potential. McCreary’s (1994) work on gender roles suggests that:

...Because the male gender role is higher in status than the female gender role, ... males ... who act in a cross-gender manner are acting in a way that reduces their social status, and are punished for that action (Feinman, 1984; McCreary, 1994; in Wong, McCreary, Carpenter, Engle & Korchynshy, 1999, p. 29).

Thus, Bouchard & St-Amant’s finding that boys subscribe to their gender stereotype more than girls do is logical if the male stereotype is higher in status – girls “refuse to define themselves as docile or submissive and tend to achieve better in school. In other words, girls who show less social conformity are more successful” (Bouchard & St-Amant, 2000, p. 282). It is unclear in Bouchard and St-Amant’s (2000) study, though, how boys’ achievement is influenced by their subscription to the male stereotype.

Findings in cognitive psychology about how stereotyping occurs, point to the need for careful attention to the question of societal expectations/stereotypes. Blair and Banaji (1996), in their study of cognitive processes involved in stereotyping, point out that the fact “that automatic processes may be involved in stereotyping is disturbing

because such processes reveal the potential to perpetuate prejudice and discrimination...” (p. 1159). They also indicate that “targets of automatic stereotyping may be less likely to correctly attribute negative consequences to perceiver bias, disrupting self-protective attributional processes” (Banaji & Greenwald, 1995; Jost & Banaji, 1994; in Blair & Banaji, 1996, p. 1159). In other words, if there is indeed stereotyping of male learners in schools, boys may be attributing their relatively more limited success to internal traits rather than to unfair expectations, stereotypes, or evaluative bias.

Steele (1997) observes that for women and Black students in the United States, a perceived threat in school, such as a perception that they are not expected to achieve as well as other students, could in itself lead to lower achievement, even in the absence of any actual academic weaknesses. Such students are at risk of not identifying with school. Steele (1997) goes on to observe that:

...a protective avoidance of identification can become a group norm. In reaction to a shared sense of threat in school, for example, it can become a shared reaction that is transmitted to group members as the normative relation to school. Thus, disidentification can be sustained by normative pressure from the in-group as well as by stereotype threat in the setting” (footnote, p. 619).

Contrary to Steele’s (1997) research focus, the present study focused on exploring the lower achievement of male students. Nonetheless, Steele’s (1997) findings about group effects may shed light on the situation of male learners in an urban Saskatchewan setting. The possibility that male learners perceive that they are not *expected* to achieve as well as their female counterparts may be a threat to their actual achievement. In other words, perceived role and societal expectations regarding male students’ academic achievement,

independent of other social expectations/stereotypes, may in and of themselves contribute to lower achievement. This may occur either because of group “disidentification”, as posited by Steele (1997), or because “gender stereotyping is a substitute for knowledge. It furnishes a ready-to-think concept of reality that is inconsistent with school success” (Bouchard & St-Amant, 2000, p. 282).

Gender Psychology

Although outside forces, such as home socialization or societal expectations, may be differentially influencing boys’ and girls’ achievement, there may also be internal traits or tendencies at play with male and female students. Gambell and Hunter (1999) suggest that one reason for gender differences in literacy “may lie in the deeply-rooted psychology of maleness” (p.12)⁴. They cite results from Saskatchewan attitudinal indicator surveys, showing that males prefer active tasks in a group setting rather than passive, solitary tasks such as reading or writing. Also, they stress that by addressing only the content in curriculum, educators may be failing male students by ignoring the kinds of literature that interest these students, such as periodicals and computer resources (p. 12).

Snyder (2000) supports the findings that male and female students show different areas of strength and preference. In her study about the relationship between learning styles/multiple intelligences and academic achievement of high school students, she found that:

⁴ Gambell and Hunter (1999) refer to this explanation as “male psychology”. However, in the present study, the term “gender psychology” is used to indicate that both feminine and masculine traits were studied as potential sources of influence on students’ achievement.

...female students were stronger on intrapersonal, linguistic, musical, prefers working alone, visual, interpersonal, self motivated, prefers quiet, GPA, analytical, and persistence. The male students were stronger and bodily/kinesthetic, logical, spatial, and working with others (p. 18).

Reed (1999) also presents some of the current arguments suggesting a fundamental psychological difference between boys and girls. She reviews some educational consultants' claims that boys' mental processes develop differently than do girls', and that boys find reflective emotional-centered tasks more difficult than speculative thinking and action (see Reed, 1999, p. 99 for a more complete review).

The question of emotional intelligence appears to have more relevance to academic achievement than may have been acknowledged in the past. Tapia (1999) studied the relationships between emotional intelligence, using the Emotional Intelligence Inventory, and (a) intelligence as measured by the Otis-Lennon School Ability Test; (b) academic achievement as measured by the Preliminary Scholastic Assessment Test for high school students in Mexico. Her results indicate a path "from gender to empathy, self-control, and GPA; ... from self-control to GPA and to verbal; ... and from empathy to GPA and from verbal to GPA" (Tapia, 1999, p. 15). Given that females scored higher on the EQI, it would be interesting to further study the impact of different aspects of emotional intelligence on academic achievement, and whether emotional intelligence is biologically-based, hence stable, or a product of socialization.

It is possible that gender differences in academic achievement are due to inherent learning differences and interests between boys and girls, beyond what they learn through socialization. Obviously, whether or not these potentially 'inherent differences' are

universal or locally mediated has intervention implications. Thus, teasing male psychology from social expectations in urban Saskatchewan is relevant to how educators can address boys' needs in school.

However, teasing these factors apart is difficult and controversial. Kilmartin in *The Masculine Self* (1994) points out that "there is little dispute that biological sex differences produce ... physical differences. But to what extent do they produce *psychological* sex differences as well?" (italics in original, p. 47). He reviews the major biologically-based explanations of sociobiologists for the differential behaviour patterns between males and females. For each theme, he references important researchers in the area: reproductive investments and strategies (Daly & Wilson, 1983; Symons 1987; Darwin, 1871), male aggression, competition, risk taking, and dominance (Daly & Wilson, 1983; Money 1987a, in Kilmartin, 1994, p.52-54).

Although Kilmartin (1994) is fiercely critical of the sociobiological downplaying of social influences, he warns against dismissing it summarily:

Many researchers who are not identified with sociobiology (e.g., Money, 1987a; Maccoby, 1987) agree that biology probably produces different sensitivities to behavioral influences in males and females. Social influence can exaggerate or modify these sensitivities, and possibly not in a simple, straightforward way (Kilmartin, 1994, p. 58).

Therefore, it is likely that whichever differences between the genders have a biological basis, they are likely mediated by sociological factors, suggesting a complicated interaction between different influences in young people's lives.

Interestingly, the characteristics outlined by Kilmartin (1994) as being masculine also appear in the Bem Sex-Role Inventory (BSRI, 1974). The 20 traits defined as masculine on the BSRI are: acts as a leader, aggressive, ambitious, analytical, assertive, athletic, competitive, defends own beliefs, dominant, forceful, has leadership abilities, independent, individualistic, masculine, self-reliant, self-sufficient, makes decisions easily, strong personality, willing to take a stand, and willing to take risks. In contrast, the 20 feminine traits are: affectionate, cheerful, childlike, compassionate, does not use harsh language, eager to soothe hurt feelings, feminine, flatterable, gentle, gullible, loves children, loyal, sensitive to the needs of others, shy, soft-spoken, sympathetic, tender, understanding, warm, and yielding (in Auster & Ohm, 2000).

Auster and Ohm (2000) studied whether the BSRI, dating back to the early 1970's, was still relevant. They found that 18 of the female traits reached significance levels (.5) – only “childlike” and “yielding” no longer reached significance as desirable traits for women. However, only 8 of the 20 masculine traits reached the same level of significance based on the male participants' desirability ratings of the traits: acts as a leader, aggressive, ambitious, dominant, forceful, has leadership abilities, independent, and masculine (Auster & Ohm, 2000, p. 506). It should be noted that for 18 of the 20 masculine traits, female respondents' desirability ratings reached significance, excluding only “analytical” and “makes decisions easily”, indicating that the two genders are not necessarily in agreement as to what is a typical or desirable trait for each gender. Further, although most of the masculine traits listed by Kilmartin (1994) are in the original BSRI list of masculine traits, including reproductive investments and strategies, male

aggression, competition, risk taking, and dominance, they do not correspond to Auster and Ohm's (2000) findings.

Although the list of traits qualifying for innately masculine is unclear, it nonetheless appears relevant to study the potential influence of gender traits, whether socially or biologically based, in that they may significantly mediate the relationship between biological sex and academic success.

Equity Policy

Although no school can realistically mediate all the factors at play in a student's life, be they in the home, in society, or within individuals themselves, they typically strive to reach the ideal of equal and fair education for all learners. School boards and government bodies have historically attempted to address large-scale concerns and beliefs in mission statements and formal policies. For example, Saskatchewan Learning (formerly Saskatchewan Education) has a stated equity policy. As per the Saskatchewan Education Indicators Report (2000), they state that:

Specifically, planning and systematic approaches must be taken to address the needs of students with exceptional learning and behavioural characteristics and disabilities, Aboriginal students and at-risk students, *and to ensure equity of opportunity and of benefit for female and male students* (italics added, Saskatchewan Education, 2000, p. 66).

The gender perceived to be at risk is not indicated, but the document does indicate that Saskatchewan Learning is committed to providing not only equal opportunity, but equity of *benefit* as well. How Saskatchewan Learning intends to measure benefit is unclear, but

one might assume that academic achievement would be considered as one indicator of boys' and girls' benefit from the public education they receive.

In spite of the guidance that published policies can offer to educators, Blair and Sanford (1999) have found that, "few school districts in Western Canada have a comprehensive gender-equity policy that encompass [sic] equity for students, and even fewer have any in-depth plan for implementation for equity initiatives" (p. 11). Although Saskatchewan Learning and the Saskatchewan Teachers' Federation, both have equity policy statements, the present researcher did not find any comprehensive documents that include an explicit plan of action where the gender difference in achievement is concerned.

Saskatchewan Learning, jointly with the Saskatchewan Teachers' Federation, the Saskatchewan School Trustees Association, the League of Educational Administrators, Directors and Superintendents, and the Saskatchewan Human Rights Commission, (1997), issued a document entitled, *Our Children, Our Communities and Our Future: Equity in Education – A Policy Framework*. In it, they state that "schools continue to be challenged to provide a gender-equitable environment. Gender equity relieves pressures for both females and males to conform to limiting gender stereotypes" (p. 7). However, in specifying the gender group perceived to be at a disadvantage, the document reveals that "...beyond high school, women have limited employment diversification and a proportionately low participation in the growth sectors of the economy. Continued efforts are needed to encourage young women to consider all options when moving from high school to work or further education" (p. 7). While this may be true, the document remains silent on the subject of male issues in education.

The Saskatchewan Teachers' Federation elaborates its gender equity policy in its *Statement of Policy and Bylaws 2000-2001*. In the gender equity section (6.6), it states the following beliefs:

1) Inequities based on patterns of male domination are unjust and must be eliminated; 2) Gender equity promotes development of all people. Narrowly defined sex roles are detrimental to both men and women; 3) The Federation is committed to working proactively ... so that all students are encouraged to develop to their full potential ... ; 4) In addition, the STF believes the following with regard to gender equity: (a) the participation of both men and women is essential; (b) the role of women as leaders is essential; (c) organizational and interorganizational effort and commitment are required...; (d) attention to process and modeling the desired change are essential; (e) gender equity is a professional issue (numeration as in original, pp.104-105).

The document also flags areas of potential discrimination and bias (section 6.8.3): “(a) delegation of responsibilities in the school, (b) school programs and offerings, (c) curricula, (d) instructional materials, (e) extra-curricular activities or, (f) other areas in which discrimination is reinforced or perpetuated” (p. 106).

Thus, it is obvious that although gender equity policies in education philosophically strive to establish equity for both male and female students, their specific goals appear to focus more on female learners than on male learners.

In their *Education Indicators in Canada 1999*, CMEC indicates that:

The higher ratio of female graduates to the 18-year-old population compared with males, combined with the higher percentage of female 19- to 20-year-olds who

report that they have received a high school diploma, indicates that progress has been made in efforts to improve the achievement of females. Close monitoring of the situation among males would now be beneficial (p.90).

In the area of literacy, Gambell and Hunter (1999) raise important questions, such as “whether gender equity in literature selection has promoted reading material of little or no interest to males. More opportunity for male identification with texts and more appealing narrative genres are needed to better engage male readers of all ages” (p. 13).

Christina Hoff Sommers (2000), in her controversial book, The War Against Boys: How Misguided Feminism is Harming our Young Men, argues that “engagement with school is perhaps the single most important predictor of academic success [...but] boys’ weaker commitment is not addressed at the equity seminars and workshops around the country” (p. 9). Sommers (2000) also cites Hedges and Nowell’s warning that:

The generally larger numbers of males who perform near the bottom of the distribution in reading comprehension and writing also have policy implications. It seems likely that individuals with such poor literacy skills will have difficulty finding employment in an increasingly information-driven economy. Thus, some intervention may be required to enable them to participate constructively (Sommers, 2000, p. 12).

That large numbers of male students may be under- or unemployed suggests a worrisome educational outcome worthy of further investigation.

OECD found, in its PISA 2000 project, that “some aspects of school policy and practice tend to be associated with better student performance” (OECD, 2000, “What can schools do to make a difference?”). Three examples of positive policies and practices are

identified as teacher-related factors affecting school climate, teacher morale and commitment, and school autonomy. One might argue that school autonomy is outside the scope of research on gender differences in student achievement, but in fact, school policies are within students' macrosystem, according to Bronfenbrenner's ecological model (Thomas, 2000). Thus, although school or government policies do not always directly impact on students, they create a ripple effect within the schools and often the classrooms which, in turn, touches the students. In addition, the PISA 2000 results indicate that, indeed, policies affecting such important facets as morale, school climate and school autonomy, do impact student achievement.

It is important to investigate how equity policies impact male students' achievement because of the systemic nature of such policies. In other words, if schools and school boards are committed to policies that disadvantage boys, even if unintentionally, then addressing these policies is an important point of departure. A system-wide investigation of boys' and girls' achievement patterns would potentially increase parent, teacher, and even student awareness of the current issues related to gender patterns in achievement, thereby also influencing the role expectations and evaluative biases that may have inadvertently crept into boys' school experience.

Summary

There have been a number of explanations for the skewed achievement patterns, and many different approaches have been taken to address the issue. First, there are different theories as to the nature of these gender differences, ranging from the psychological to the sociological. Second, even within the various camps, several remedial approaches have been suggested. These range from methods that are relatively

easy to integrate into typical classrooms, such as increasing the use of technology and literature with more “masculine” content, to more dramatic changes such as single-sex schooling. However, these attempts to address differential academic achievement between boys and girls have not produced consistent results for either gender, particularly single-sex schooling which, for the most part, has been designed to enrich girls’ educational experiences.

Although there remains some debate by feminist researchers whether boys should be identified as at-risk, when other areas of society still reflect an underrepresentation of girls and women, there appears to be little disagreement that boys have consistently scored lower than girls in many subject areas over the past few years. In addition, since the various policy-making bodies in Saskatchewan have committed to an equitable education for all students, it is important to study the issues and to formulate ways of addressing current inequities.

Informing any future recommendations and policy-related decisions will hopefully be some understanding of the many explanatory variables for the differential achievement of boys compared to girls. Such explanatory variables have been grouped into five categories of explanations by Gambell & Hunier (1999), and used as a framework for this study. This framework was then further explicated in light of the work of various theorists and policy makers in each of the five areas.

CHAPTER THREE

Methodology

This study was conducted with specific research questions in mind, based on evidence in the literature of differential achievement between boys and girls, various theoretical underpinnings, and the work of Gambell and Hunter (1999). The researcher designed the research instruments for this study, based on the framework proposed by the former. This chapter elaborates on the research design, sample selection, instrument development, data collection and results of this study.

Research Design

This research was exploratory in nature, designed specifically to examine the potential areas of influence on academic achievement, in light of the observed gender differences in many recent provincial, national, and international assessments. The potential areas were chosen based on five explanatory categories proposed by Gambell and Hunter (1999): evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy. As both teachers and students participated, two separate research instruments were used, providing data used for quantitative analysis and for preliminary comparative analyses.

Sample Selection

Data were collected in a survey of two groups, high school teachers and high school students. First, a sample of 497 students who was randomly selected from the school division's database. A total of 153 (30.8%) students from these schools responded

to the survey. These participants represented Grade 9, (n = 44), Grade 10 (n = 48), Grade 11 (n = 31), and Grade 12 (n= 29).

The sample included both female (n= 81) and male (n=71) students, with one participant not indicating sex. Students were asked to self-report their academic achievement, defined as their “overall average for academic subjects”, in one of three categories – below 64%, between 65-75%, and above 75%.

In addition to the 153 students, 36 teachers responded to a teacher questionnaire. These teacher-participants all taught Grades 9 through 12, but they represented a range of experience: 0 to 3 years, 4 to 10 years and over 10 years.

Instruments

The two instruments used in this study were constructed by the researcher based on the five explanatory categories outlined by Gambell & Hunter (1999): evaluative bias, home socialization, role and societal expectations, male psychology and equity policy, and on influential theories in each of the corresponding research areas.

To explore these five explanatory categories with regards to students in the western Canadian context, a survey for high school students was constructed. This instrument was designed to provide information about the role of the five explanatory categories in academic achievement. After consultation with research experts, the present researcher utilized influential publications or theories underlying each of the categories in order to ensure a certain degree of content validity of the items – these theories are described in more detail later.

The researcher also designed a teacher survey in order to explore the possibility of patterns or discrepancies between teacher and student perceptions on similar items, which

might then provide further information into the question of differential achievement between boys and girls. However, because gender differences are a rather controversial topic, and most teachers are versed in the concept of equal opportunities for all learners, the researcher was concerned about answers based on social desirability. After consultation with a research expert, the researcher opted for a forced-judgement questionnaire.

The student instrument (Appendix C) consisted of 99 Likert-type items, with the choices “strongly agree”, “agree”, “unsure”, “disagree” and “strongly disagree”. The items on evaluative bias were constructed using the five themes outlined in *Principles for Fair Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993): developing and choosing methods for assessment (Theme I), collecting assessment information (Theme II), judging and scoring student performance (Theme III), summarizing and interpreting results (Theme IV), and reporting assessment findings (Theme V) (see Table 1 for student items by theme).

The items on home socialization were constructed based on the parenting styles described by Maccoby (1992): authoritarian, authoritative, permissive and disengaged, which vary according to their levels of involvement/responsiveness, and demandingness. Thus, the items in this section correspond to the latter two characteristics.

Table1. Student Instrument Items by Theme.

Theme	Items
Evaluative Bias	n = 26
• Developing and choosing methods for assessment	• 5, 7, 12, 15, 16, 19
• Collecting assessment information	• 1, 8, 9, 17, 26
• Judging and scoring student performance	• 2, 3, 13, 18
• Summarizing and interpreting results	• 4, 14, 21, 25
• Reporting assessment findings	• 6, 11, 20, 24
• General	• 10, 22, 23
Home Socialization	n = 19
• Responsiveness	• 27, 30, 37, 39, 41, 43, 44, 45
• Demandingness	• 29, 31, 32, 35, 36, 38, 40, 42
• General	• 28, 33, 34
Role & Societal Expectations	n = 15
• School settings	• 46, 48, 49, 51, 52, 53, 54
• Peer settings	• 47, 50, 55, 56, 57, 58, 59, 60
Gender Psychology	n = 20
• Safety (Emotional climate)	• 62, 64, 65, 79, 80
• Aggression	• 61, 68, 71, 78
• Competition	• 72, 73, 76
• Risk-taking	• 66, 67, 74, 75
• Dominance	• 63, 69, 70, 77
Equity Policy	n = 19
• Interest/engagement	• 82, 83, 85, 97
• Equal participation	• 81, 84, 98, 99
• School programs/offerings	• 82, 92, 95, 96
• Instructional materials	• 87, 88, 89, 93
• Extracurricular activities	• 90, 91, 94

Collins et al. (2000) point out that family and home socialization effects cannot be considered without also considering a child's roles, activities, and interpersonal relationships at school and with peers. Thus, the idea of Bronfenbrenner's three predominant microsystems of home, school and peer settings (Thomas, 2000, p. 406) was used to construct the section on role and societal expectations. Given that the home socialization factors are investigated in their own section, the influences of the students' roles, activities and/or interpersonal relationships at school and with peers are explored in the role and societal expectations portion of the instrument.

The following section, on gender psychology, was based on what Gambell and Hunter (1999) refer to as a “deeply-rooted psychology of maleness” (p. 12). Thus, the items were based on sociobiological constructs of male characteristics (Kilmartin, 1994), which are supported by the traits defined in the Bem Sex Role Inventory (1974). Because socially imposed norms were explored in the home socialization and role/societal sections of the instrument, the question of a sociobiological basis to this “maleness” was explored here.

Finally, the question of equity policy was explored in the final section of the instrument, using the guidelines set out by the Saskatchewan Teachers’ Federation (STF, 2000). The STF states that teaching professionals must strive to eliminate gender discrimination in the following areas: “delegation of responsibilities within the school, school programs and offerings, curricula, instructional materials, extra-curricular activities, and/or other areas in which discrimination is reinforced or perpetuated” (STF, 2000, p.106). It should be noted that the terms “subscale” and “section” do not appear in the instrument itself – all items follow each other without delineation, so as not to influence students’ responses.

Although the instrument items were based on well-established theories and knowledge in the various areas, logistical concerns prevented the establishment of validity and reliability tests such as a Q-sort, review by experts in each of the areas, or a pilot study⁵. Thus, little was known about the measurement properties of the instrument as a whole at the outset of the study. However, after the study was completed, the researcher tested the reliability using Cronbach’s alpha (.72). This result suggests that

⁵ See Chapter One for limitations of the study.

although validity and reliability interventions would be beneficial in the construction of future instruments in this area of study, there is nonetheless a satisfactory level of reliability associated with the present student instrument.

The teacher questionnaire (Appendix D) closely resembles the student instrument in that it was designed based on the same explanatory theories outlined by Gambell and Hunter (1999). The teacher questionnaire, however, addressed the teachers' perceptions of these theories/factors on girls' and boys' achievement. It had 91 forced-judgment items⁶. Table 2 outlines the items by theme.

Table 2. Teacher Instrument Items by Theme

Theme	Items
Evaluative Bias	n = 26
• Developing and choosing methods for assessment	• 1, 9, 10, 11, 16
• Collecting assessment information	• 5, 7, 8
• Judging and scoring student performance	• 6, 12, 13
• Summarizing and interpreting results	• 2, 15, 18, 62
• Reporting assessment findings	• 14, 17, 65
• General	• 3, 4, 57, 58, 59, 61, 63, 64
Home Socialization	n = 14
• Responsiveness	• 22, 23, 24, 25, 66, 69
• Demandingness	• 19, 20, 21, 26, 27, 68, 92
• General	• 67
Role & Societal Expectations	n = 15
• School settings	• 31, 32, 71, 72, 73, 74, 75
• Peer settings	• 28, 29, 30, 33, 34, 35, 36, 70
Gender Psychology	n = 18
• Safety (Emotional climate)	• 37, 38, 39, 40, 42, 83
• Aggression	• 43, 44, 76
• Competition	• 41, 78, 79
• Risk-taking	• 77, 80, 84
• Dominance	• 81, 82, 85
Equity Policy	n = 18
• Interest/engagement	• 49, 51, 86, 88
• Equal participation	• 87, 56, 91
• School programs/offerings	• 50, 54, 90
• Instructional materials	• 45, 46, 47, 48, 55
• Extracurricular activities	• 52, 53, 89

⁶ Note: The teacher questionnaire jumps from item 59 to item 61 due to an accidental omission during the formatting of the questionnaire.

Data Collection

The names of 497 students in grades 9 to 12 were randomly selected from three high schools. A total of 153 students volunteered to participate in the study. The researcher administered the student instrument during school hours. The questionnaire took approximately 15 minutes to complete, after which time the completed questionnaires were returned to the researcher in a random pile.

Data Analysis

The student and teacher instruments were scanned and analysed quantitatively using the SPSS statistical computer software program (SPSS Inc., 1999). For the student instrument, this analysis consisted of descriptive statistics, a multivariate analysis of variance (MANOVA), and Pearson product-moment correlations. Only descriptive statistics were used in analysing the teacher instrument.

In order to answer the first research question, “What is the effect of gender, achievement level, and grade on each of the five explanatory categories?”, the equality of group sizes for grade (4), gender (2) and achievement level (3) was first tested using a chi-square test. Next, a preliminary examination of group differences was conducted using each group’s total mean per explanatory category. This was achieved by grouping the items in each of the five explanatory categories and computing a total mean. This process required some items to be recoded using statistical software, so that the point-value of all items was equivalent. After the means for each category and each group were compared, MANOVA was computed in order to explore any significant effects of the group variable on response patterns. This multivariate analysis permitted the researcher to test the null hypothesis about the effects of each of the three independent variables,

namely grade, gender and achievement level, on each of the five explanatory categories. This method reduced the potential for Type I errors, or the rejection of a true null hypothesis, compared to that of a series of univariate analyses, or ANOVAs (Homack, 2001). Follow-up ANOVAs were only conducted as a follow-up once interaction effects were ruled out.

The second research question, “What is the nature and extent of the relationship among evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy?”, was addressed using both descriptive statistics such as total score and standard deviation of each category, and a correlation matrix among the five explanatory categories.

Finally, the third question, “To what extent is there congruence between student and teacher perceptions of similar issues?”, was addressed more informally, due to both the exploratory nature of the study and the limited comparability of the teacher and student instruments. Potential discrepancies in perception between teachers and students were explored by loosely comparing the items on the teacher questionnaire with an agreement rate of 80% or better, with the descriptive and/or inferential statistics related to any parallel student items. For student items, the descriptive statistics consisted mainly of frequencies, whereas the inferential statistics consisted of an analysis of variance (ANOVA), based on the main and/or interaction effects of grade, gender and achievement level.

Research Approval

The researcher submitted a request to conduct the present research study to the University of Saskatchewan’s Advisory Committee on Ethics in Behavioural Science

Research. After having been granted permission from the former, the researcher submitted a research proposal to a superintendent of the school division in which the study was conducted (see Appendix F). The school division approved the present research to be conducted within their high schools and the principals were informed of the researcher's forthcoming contact with them.

All student participants in the study signed student assent forms (Appendix C). As well, parental consent was required for each student participant (Appendix B).

Summary

In order to study the potential influence of the five explanatory categories defined by Gambell and Hunter (1999), both student and teacher instruments were constructed based on theoretical constructs. After having obtained consent from the appropriate regulatory bodies, the student instruments were administered to 153 students in three western Canadian high schools, whereas the teacher questionnaires completed by 36 teachers on their own time. The data were then analyzed using statistical software. Descriptive statistics were used to study all research questions, and inferential statistics were used to answer specific research questions.

CHAPTER FOUR

Results

Research from around the world has consistently demonstrated that girls outperform boys in many areas of academic achievement throughout grade school, on a variety of assessment measures. This pattern of differential achievement has attracted the attention of educators, policymakers and researchers alike. This study in particular was designed to explore students' and teachers' perceptions of the factors affecting boys' and girls' academic achievement at the high school level.

The overall research question for this exploratory study, "How do the five possible explanatory categories identified by Gambell and Hunter apply to the differential achievement between boys and girls in urban Saskatchewan secondary schools?", was addressed through three more specific research questions: (a) Is there an effect of gender, achievement level, and grade on each of the five explanatory categories?; (b) Is there a relationship between evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy?, and; (c) Is there congruence between student and teacher perceptions of similar issues?

This chapter presents the results of the study. First, the measurement properties of the instruments are discussed, followed by the results of the data analysis for both the student instrument and the teacher questionnaire.

Measurement Properties of the Instruments

Exploring an instrument's measurement properties is an important first step in relation to data analysis, in order to ascertain whether any statistical computations and resulting conclusions are based on valid and reliable results.

Cronbach's alpha was computed for the 99-item student instrument, to examine its reliability. Initially, Cronbach's alpha was found to be .74. However, this estimate contained 26 non-responses. When these non-responses were replaced by each participant's total mean response for the category within which the non-response appeared, alpha became .72. Cronbach's alpha was also computed on each of the instrument's categories, which produced a range of .52 and .72. This reflects the fact that a larger number of items typically increases reliability, making the overall alpha value of .72 stronger than the smaller groups of items.

Results of Student Differential Achievement

Effect of Grade, Gender, and Achievement Level

In order to answer the question, "What is the effect of gender, achievement level, and grade on each of the five explanatory categories?", it was first necessary to examine the equality of group sizes for grade, gender, and achievement level (see Table 6 for number of participants representing each group)⁷.

The assumption of equal group sizes was tested using a chi-square test. For the independent variable of grade, $\chi^2 = 7.000$ ($df = 3$), $p = .07$. and for gender, $\chi^2 = .66$ ($df = 1$), $p = .42$. The probability that the differences between groups are due to true

⁷ For all data analysis procedures noted in this chapter, the researcher replaced missing values with the participants' mean response for the category of the missing value.

Measurement Properties of the Instruments

Exploring an instrument's measurement properties is an important first step in relation to data analysis, in order to ascertain whether any statistical computations and resulting conclusions are based on valid and reliable results.

Cronbach's alpha was computed for the 99-item student instrument, to examine its reliability. Initially, Cronbach's alpha was found to be .74. However, this estimate contained 26 non-responses. When these non-responses were replaced by each participant's total mean response for the category within which the non-response appeared, alpha became .72. Cronbach's alpha was also computed on each of the instrument's categories, which produced a range of .52 and .72. This reflects the fact that a larger number of items typically increases reliability, making the overall alpha value of .72 stronger than the smaller groups of items.

Results of Student Differential Achievement

Effect of Grade, Gender, and Achievement Level

In order to answer the question, "What is the effect of gender, achievement level, and grade on each of the five explanatory categories?", it was first necessary to examine the equality of group sizes for grade, gender, and achievement level (see Table 6 for number of participants representing each group)⁷.

The assumption of equal group sizes was tested using a chi-square test. For the independent variable of grade, $\chi^2 = 7.000$ ($df = 3$), $p = .07$. and for gender, $\chi^2 = .66$ ($df = 1$), $p = .42$. The probability that the differences between groups are due to true

⁷ For all data analysis procedures noted in this chapter, the researcher replaced missing values with the participants' mean response for the category of the missing value.

for each respondent. The grand mean of all respondents belonging to a particular gender, grade, or achievement group was then calculated and used as the group mean.

Because all items were based on a five-point Likert scale, a score of over 3 for any category was considered a high score. However, some of the items were recoded before statistical analysis took place because of their wording. For example, a high score (over 3) indicated a high perception of bias by the student for items on evaluative bias (EB). The direction of the bias did not affect the score, only that the student did not perceive that all learners benefit equally from classroom activities. However, item 2 states “On exams, my teacher(s) usually indicate how each question is weighted/evaluated”. A high level of agreement would produce a high score, but in this case, it would also suggest fair assessment practices. Thus, in order for a high score to indicate a high perception of bias/unfair assessment, the weighting of the item was reversed (recoded) for statistical purposes so that a high level of agreement would produce a low score. In total, twenty-nine items were recoded.

For home socialization (HS), a high score indicated high home support of academic achievement. Similarly, a high score on role and societal expectations items (RE) indicated high support from figures outside the home for school success/academic achievement.

A high score on gender psychology items (GP) suggested a good student-school fit – in other words, the participant reported a concordance between his/her learning style and interests, and classroom strategies or school-level opportunities. A high score on items related to equity policy (EQ), indicated a perception of equity at the school level. See Table 4 for the mean score for each category, by grade.

Table 4. Student Mean Score and Standard Deviation of Explanatory Categories by Grade ($n = 153$)

	Mean Total Score (SD)				
	Grade				
	9	10	11	12	Total
EB	2.51 (0.34)	2.79 (0.37)	2.52 (0.37)	2.54 (0.32)	2.59 (0.36)
HS	3.43 (0.43)	3.36 (0.45)	3.23 (0.31)	3.19 (0.54)	3.30 (0.44)
RE	3.73 (0.40)	3.60 (0.34)	3.60 (0.39)	3.60 (0.56)	3.63 (0.43)
GP	3.44 (0.35)	3.44 (0.32)	3.46 (0.25)	3.41 (0.37)	3.45 (0.33)
EQ	3.60 (0.37)	3.42 (0.37)	3.43 (0.43)	3.36 (0.47)	3.27 (0.41)

All groups were very similar in their average response for each category. In fact, only the low achievement group deviated noticeably from the others. Table 5 indicates the item-by-item account of mean scores by achievement level for each explanatory category.

Table 5. Student Mean Score and Standard Deviation of Explanatory Categories by Achievement Level ($n = 153$)

	Mean Total Score (SD)			
	Achievement Level			
	Low	Medium	High	Total
EB	2.90 (0.40)	2.64 (0.29)	2.44 (0.33)	2.66 (0.36)
HS	3.18 (0.45)	3.23 (0.41)	3.38 (0.45)	3.26 (0.44)
RE	3.62 (0.37)	3.56 (0.65)	3.64 (0.46)	3.60 (0.43)
GP	3.20 (0.31)	3.36 (0.29)	3.50 (0.32)	3.35 (0.33)
EQ	3.13 (0.51)	3.44 (0.41)	3.51 (0.38)	3.36 (0.41)

Contrary to the results of the low achievement group compared to the other achievement groups, boys' and girls' group means for each category as a whole were fairly consistent, as shown in Table 6.

Table 6. Student Mean Score and Standard Deviation of Explanatory Categories by Gender ($n = 153$)

	Mean Total Score (SD)		
	Gender		
	Male	Female	Total
EB	2.54 (0.35)	2.53 (0.35)	2.54 (0.36)
HS	3.34 (0.44)	3.31 (0.45)	3.32 (0.44)
RE	3.60 (0.43)	3.67 (0.42)	3.64 (0.43)
GP	3.41 (0.33)	3.47 (0.32)	3.44 (0.33)
EQ	3.43 (0.41)	3.50 (0.41)	3.46 (0.41)

Although the mean responses of most student groups appeared fairly similar, with the exception of the low achievement group, MANOVA was computed in order to discover whether grade, gender or achievement level had any main or interaction effects on overall response patterns to each explanatory category. For this statistic, the total score was used for each category, rather than the mean score. The category total scores were calculated by adding all scores for each item of a particular category for each respondent.

Before the groups were compared, the researcher tested the assumption of homogeneity of the groups. Box's test of equality of covariances for the three independent variables, or grade, gender, and achievement level, exceeded the .05 significance level $F(3, 150) = 1.08, p = .24$, indicating homogeneity of covariances. Thus, the MANOVA test was conducted.

The MANOVA results using Wilks' Lambda showed no interaction effects for any of the combinations of independent variables, and only achievement level showed a main effect, $F(2, 151) = 3.18, p < .01$ (as shown in Table 7).

Table 7. Effect of Grade, Gender and Achievement Level on Student Responses ($p = .05$)

Effect	F	df	p
GRADE	1.501	15.000	.102
GENDER	.162	5.000	.976
ACHIEV	3.184	10.000	.001
GRADE*GENDER	.419	15.000	.973
GRADE*ACHIEV	1.090	30.000	.343
GENDER*ACHIEV	.567	10.000	.841
GRADE*GENDER *ACHIEV	.923	25.000	.573

Although post hoc tests could not be computed for the gender groups ($n < 3$), they were used to study group differences for grade and achievement level, in order to determine which groups differed (Homack, 2001). A .01 significance level was used, based on .05 divided by the number of dependent variable categories (i.e., five). Tukey's honestly significant difference (HSD) showed no statistically significant differences between students by grade. There were some statistically significant results for achievement level, however. For the combined evaluative bias score, the high achievement group had statistically significant differences with both the low group ($p < .01$) and the medium group ($p < .01$). Neither home socialization, nor role and societal expectations, produced any statistically significant differences between groups. However, the high achievement group showed statistically significant differences with the low group for both gender psychology ($p < .01$) and equity policy ($p < .01$) items. Equity policy items also produced statistically significant differences between the medium and low groups ($p = .01$).

Following the discovery of statistically significant main effects for achievement level in the evaluative bias, gender psychology and equity policy categories, as discovered using MANOVA, further analyses using ANOVA ($p = .05$) were conducted for the items contained within these three explanatory categories. This was done in order to obtain more information as to which items in particular showed statistically significant differences based on achievement level, and which achievement groups had different responses from the others. Bonferroni's post hoc test ($p = .05$) was used to confirm group differences, because of the small number of pairwise comparisons.

Evaluative Bias. MANOVA results indicated that the differences between the high and low groups, as well as between the high and medium groups, reached statistical significance for the evaluative bias category, based on each group's mean category scores. Upon closer examination using ANOVA for each individual item, 11 of the 26 items showed statistically significant differences between achievement groups. Table 8 shows each group's mean responses for each of these 11 items.

Table 8. Effect of Achievement Level on Student Evaluative Bias Items

Category	Item	Mean (SD)		
		Low	Medium	High
EB	2. My teachers indicate weight of exam questions	2.77 (1.36)	3.63 (.99)	3.64 (.97)
	4. I disagree with teachers' comments on report card	3.69 (1.03)	2.78 (.94)	2.39 (.97)
	6. I am surprised by questions on exams	3.77 (1.17)	3.27 (1.20)	2.79 (1.00)
	7. I am unsure of how teachers come up with grade	3.92 (.95)	3.05 (1.05)	2.60 (1.01)
	8. I am confused by the questions on exams	3.54 (1.13)	3.10 (1.02)	2.32 (.82)
	12. I do well on long answer questions	2.23 (1.36)	2.48 (1.09)	3.32 (1.12)
	13. I know why I get particular mark on tests	3.31 (1.11)	3.61 (.83)	3.84 (.67)
	16. I do well on short answer questions	2.85 (1.28)	3.44 (1.03)	3.78 (.88)
	17. I understand the questions on tests	3.00 (1.08)	3.39 (.86)	3.86 (.66)
	18. I know why I get particular mark on assignments	3.08 (.95)	3.49 (.75)	3.82 (.75)
	26. I don't understand assignments	3.58 (1.16)	3.03 (1.03)	2.43 (.94)

In each instance, the high achievement group's mean response was significantly different from that of the low achievement group. For four items, they were significantly different from the medium group's responses as well, with only two items showing statistically significant differences between the low and medium groups.

For item 2, in fact, only the low group disagreed with the statement ("On exams, my teacher(s) usually indicate how each question is weighted/evaluated"), as represented by a mean response of less than 3. This response was significantly different from both other groups: $F(2, 151) = 4.41, p = .01$. The Bonferroni test confirmed statistical significance between the low/high groups ($p = .01$) and low/medium groups ($p = .02$).

For item 4, the results were similar, although in this case, the low achievement group was the only group to *agree* with the statement (“Generally speaking, I disagree with my teachers’ comments on my report card”). ANOVA results were statistically significant, $F(2, 151) = 11.39, p < .01$, as was the Bonferroni value between low/high ($p < .01$) and low/medium ($p = .01$).

For item 6, $F(2, 151) = 6.60, p < .01$, the difference between the low and high group mean responses was statistically significant ($p < .01$), but so was the difference between the medium and high groups ($p = .05$). In fact, the high achievement group was the only group to disagree with the statement (“I am often surprised by the questions on exams”). The difference between the low and medium groups did not reach significance.

Item 7 was unusual in that it was the only item where the differences in mean responses between all three groups reached statistical significance, $F(2, 151) = 10.90, p < .01$. The Bonferroni value between the low/high groups was $p < .01$, with the low/medium difference significant at $p = .02$ and the medium/high difference significant at $p = .05$. As with item 6, only the high achievement group disagreed with the statement (“I am often unsure of how my teachers come up with my mark or grade”).

Items 8 and 12 both produced results where the high achievement group’s responses differed significantly from those of the other two groups. For item 8, only the high achievement group disagreed with the statement (“I am usually confused by the questions on exams”), $F(2, 151) = 17.91, p < .01$, differing from both the medium and low groups at a $p < .01$ level (Bonferroni). For item 12, however, only the high achievement group agreed with the statement (“I normally do well on long answer

questions”), $F(2, 151) = 11.14, p < .01$. For this item, the high group’s mean response also differed from that of both other groups at the $p < .01$ level.

The ANOVA results also showed that statistically significant group effects were present for items 13 (“I normally know why I get a particular mark/grade on tests”) and 16 (“I usually do well on short answer questions”). For item 13, $F(2, 151) = 3.49, p = .03$, although all groups agreed with the statement. For item 16, $F(2, 151) = 6.24, p < .01$, with only the low achievement disagreeing with the statement. The Bonferroni test only showed statistically significant differences between groups for item 16, with the difference in mean response between the high and low achievement groups reaching $p < .01$.

Item 17 (“I usually understand the questions on a test”) reached statistical significance for achievement level as well, $F(2, 151) = 10.82, p < .01$. For this item, the high group’s mean response was statistically different from that of both other groups, although they all agreed with the statement overall. The Bonferroni value for both the low/high groups and the medium/high groups was $p < .01$.

For item 18 (“I usually understand why I receive a particular mark/grade on assignments”), ANOVA results once again pointed to statistically significant group effects, $F(2, 151) = 6.81, p < .01$, with the differences being particularly pronounced between the low and high achievement groups (Bonferroni, $p < .01$). All mean responses fell above 3, again indicating overall agreement with the statement by all groups.

Finally, for item 26 (“Often, I don’t understand what my teacher(s) want me to do for assignments”), $F(2, 151) = 10.57, p < .01$, the high achievement group disagreed with the statement overall, while the other two groups agreed. The differences in mean

responses were statistically significant between the high group and both other groups, with the Bonferroni test showing $p < .01$ for both high/low and high/medium group differences.

Gender Psychology. As reported earlier, MANOVA results indicated that achievement level produced a statistically significant main effect on mean group responses for the gender psychology category. Specifically, Tukey's HSD indicated that these differences were significant between the high and low achievement groups. When ANOVA was computed for each item in this category, nine of the 20 items reached statistical significance for achievement level – Table 9 shows mean responses for each of these items. Only four items had differences that reached statistical significance between the high and low groups. Two items showed statistically significant differences between the low and medium groups, and four between the medium and high groups.

Table 9. Effect of Achievement Level on Student Gender Psychology Items

Category	Item	Mean (SD)		
		Low	Medium	High
GP	61. I am patient and get along with teachers/classmates	3.00 (.141)	3.68 (.79)	3.87 (.92)
	63. I prefer to be leader during group work	2.69 (.95)	3.02 (1.04)	3.39 (1.10)
	66. I like trying new activities at school	3.15 (1.21)	3.78 (.82)	3.78 (.78)
	67. I prefer a constant school routine over change	2.46 (.97)	3.39 (.89)	3.10 (1.02)
	68. I sometimes get in trouble for disruptive behaviour	2.62 (1.33)	2.63 (1.11)	3.21 (1.26)
	69. I strive to get highest marks on exams	2.85 (1.21)	3.37 (1.04)	3.79 (.99)
	70. I strive to get highest marks on assignments	3.23 (1.24)	3.27 (1.05)	3.78 (1.01)
	71. Teachers see me as discipline problem, not learner	2.92 (1.38)	2.63 (1.07)	1.98 (.95)
	76. School should have no grades – pass/fail only	2.92 (1.50)	2.83 (1.24)	2.18 (1.11)

ANOVA results indicated that item 61 (“I am a patient person when it comes to getting along with my teachers and classmates”) reached statistical significance for achievement level effects, $F(2, 151) = 5.06, p < .01$. Item 63 (“I prefer to be the leader during group work”), also had statistically significant results, $F(2, 151) = 3.46, p < .01$. For both of these items, all three achievement groups agreed overall with the statements, as represented by mean scores of over 3 (although for item 61, the low achievement group had a mean score of 3.00, suggesting either uncertainty or neutrality). The Bonferroni test showed statistically significant differences between the low and high groups for item 61 ($p < .01$), but this post hoc test showed no statistically significant differences between groups for item 63.

All groups also agreed overall with item 66 (“I like trying new activities and learning opportunities at school”), although again, there were statistically significant group effects, $F(2, 151) = 3.31, p = .04$. The Bonferroni test confirmed these differences between the low and high groups ($p = .04$).

There were statistically significant effects for item 67 as well, $F(2, 151) = 4.48, p = .01$. For this item (“I prefer the school routine to stay constant rather than change a lot”), both the medium and high groups showed overall agreement, but the low group’s mean response fell below 3, indicating overall disagreement with the statement. The Bonferroni test showed that the statistically significant difference was between the low and medium groups ($p = .01$), with the high achievement group’s mean response falling between those of the other two groups.

For item 68 (“I sometimes get into trouble with my teachers for my disruptive behaviour”), the effect of achievement level also reached statistical significance, $F(2, 151) = 3.94, p = .02$. Interestingly, only the high achievement group agreed with the statement, with differences between the medium and high groups reaching statistical significance (Bonferroni, $p = .04$).

Overall, both the medium and high achievement groups agreed with the statement, “I strive to get one of the highest marks in the class on exams” (item 69), but not the low achievement group. For this item, $F(2, 151) = 6.22, p < .01$, with the Bonferroni statistic reaching significance between the low and high groups, $p < .01$. Item 70 was similar (“I strive to get one of the highest marks in the class on assignments”), but all three groups showed overall agreement with the statement. ANOVA results indicated that group effects were significant, $F(2, 151) = 4.29, p = .02$, and the Bonferroni test specified that these statistically significant differences were between the medium and high groups, $p = .03$.

Groups effects were also present for item 71, $F(2, 151) = 9.09, p < .01$. All three groups disagreed with the statement of this item (“I think my teachers see me more as a discipline problem than a learner”). However, the high group disagreed more strongly, with the Bonferroni statistic reaching significance ($p < .01$) between both high/low and high/medium groups.

All three groups also disagreed overall with the statement of item 76 (“There should be no grades in school – everyone should just pass or fail”), but group effects nonetheless reached statistical significance, $F(2, 151) = 5.72, p < .01$. More specifically,

the Bonferroni value was statistically significant between the medium and high achievement groups, $p = .01$.

Equity Policy. Initial MANOVA tests indicated that there were statistically significant main effects in the equity policy category, particularly between the high and low achievement groups, and between the medium and low groups. As with the items of the other two explanatory categories, follow-up ANOVA tests were computed for individual equity policy items. Only five of the 19 items in the category showed statistically significant group effects.

Table 10. Effect of Achievement Level on Student Equity Policy Items

Category	Item	Mean (SD)		
		Low	Medium	High
	81. Boys and girls have equal chance of succeeding	3.54 (1.20)	3.98 (1.08)	4.46 (.66)
	89. I understand my textbooks	2.77 (1.17)	3.32 (.96)	3.73 (.86)
	90. Teachers see value of extracurricular art activities	2.69 (1.25)	3.40 (.87)	3.39 (.88)
	93. Teachers use interesting materials	2.54 (1.05)	3.32 (.93)	3.06 (.97)
	98. School provides better opportunities to girls	2.85 (1.14)	2.56 (.98)	2.24 (.84)

Of the items where group effects reached statistical significance, only item 81 (“Both female and male students have an equal chance at succeeding academically at school”), $F(2, 151) = 9.76$, $p < .01$, elicited overall agreement from all three achievement groups. There were nonetheless statistically significant differences between groups, with the Bonferroni statistic attaining $p < .01$ between the low and high groups, as well as between the medium and high groups.

ANOVA results also indicated that there were statistically significant group effects for item 89 (“I understand the textbooks used in most of my courses”), $F(2, 151)$

= 7.94, $p < .01$. For this item, both the medium and high groups agreed overall with the statement, but the low achievement group's mean response fell below 3. Nonetheless, the Bonferroni statistic reached significance between the medium and high groups ($p = .05$) as well as between the low and high groups ($p < .01$).

For item 90 ("I think my teachers generally see the value of extracurricular art activities"), the low achievement group was once again the only group to disagree with the statement. Group effects were present, $F(2, 151) = 3.48$, $p = .03$, with the low group's mean response being different from that of both the other group. The Bonferroni statistic was $p = .05$ between the low and the medium groups, and $p = .03$ between the low and high groups.

Statistically significant group effects were also evident for item 93 ("My teachers use interesting reading materials in their teaching"), and as with the previous two items, only the low achievement group disagreed overall with the statement. However, the Bonferroni test only showed statistical significance between the low and medium groups, $p = .04$, with the high achievement group's mean response falling between that of the other two groups.

Finally, for item 98 ("The school provides better learning opportunities to female students"), achievement group main effects were statistically significant, at $F(2, 151) = 3.64$, $p = .03$. All three groups disagreed with the statement, with the high achievement group disagreeing most strongly. Nonetheless, post hoc results did not attain statistical significance for differences between any of the achievement groups.

In summary, data analysis of the effect of grade, gender and achievement level on the student categories included descriptive statistics and MANOVA. Only achievement

level had a main effect that reached statistical significance when MANOVA was conducted, with the differences between certain achievement groups appearing in the evaluative bias, gender psychology and equity policy categories. Follow-up ANOVA tests specified which instrument items showed statistically significant group differences.

Relationships Among Explanatory Categories

The second research question addressed the extent to which there may be a relationship between the evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policy. As with the previous research question, total scores for each category were used for analyses.

Table 11 shows the mean total score and standard deviation of all responses for each category. The category with the highest mean total score is that of gender psychology, suggesting an overall high student-school fit. This student-school fit reflects that the participant reported a concordance between his/her learning style and interests, and classroom strategies or school-level opportunities. The lowest mean total score was for the role and societal expectations category, where a high score would have suggested high support for school success from sources outside the home. Interestingly, both of these categories had the lowest standard deviations. The category with the largest spread of responses is that of evaluative bias ($SD = 9.11$). Thus, based on the standard deviation, the evaluative bias category appears to have the greatest variability, with the role and societal expectations and home socialization categories showing the least.

Table 11. Mean Total Score and Standard Deviation for Explanatory Categories

Category	<i>M</i>	<i>SD</i>
Evaluative Bias	65.91	9.11
Home Socialization	63.14	8.44
Role & Societal Expectations	54.59	6.24
Gender Psychology	68.76	6.51
Equity Policy	65.81	7.80

It was hypothesized that there would be statistically significant correlations between the total mean scores of at least some of the categories, due to the overlap of certain constructs. For example, Bronfenbrenner's ecological model of child development defines the child's dominant microsystems as home, school, and peer relations (Thomas, 2000). However, Gambell and Hunter's (1999) categories of explanations separate home socialization from role and societal expectations. Further, some researchers suggest that fair assessment, represented in the evaluative bias category, overlaps with equity policy, especially when debating whether assessments should be neutral or equitable, or both. A correlation matrix was generated, as shown in Table 12, which indicates that indeed, several of the categories are correlated at a statistically significant level ($p < .01$).

Table 12. Correlations Among Explanatory Categories ($n = 153$)

	EB	HS	RE	GP
EB				
HS	-.129**			
RE	-.255**	.260**		
GP	-.277**	.367**	.407**	
EQ	-.465**	.361**	.336**	.607**

** significant at $p < .01$, two-tailed

As seen in Table 12, there are a number of statistically significant correlations between categories based on the Pearson product-moment correlation. More specifically, there is a negative correlation between evaluative bias scores (EB) and (a) role and societal expectations scores (RE) ($r = -.26$), (b) gender psychology scores (GP) ($r = -.28$), and (c) equity policy scores (EQ) ($r = -.47$). Home socialization scores (HS) are positively correlated with (a) role and societal expectations scores ($r = .26$), (b) gender psychology scores ($r = .37$), and (c) equity policy scores ($r = .36$). There is also a positive correlation between role and societal expectations scores and both gender psychology ($r = .41$) and equity policy ($r = .34$) scores. Finally, gender psychology scores are highly correlated with equity policy scores ($r = .61$).

Teacher and Student Perceptions

The third research question dealt with the degree of congruence between teacher and student perspectives. This question was addressed more informally, as the student and teacher instruments were not directly comparable. First, frequencies were computed for all items on each of the instruments. Then, patterns and/or discrepancies between similar items were studied. This type of analysis was seen to be appropriate for a study exploratory in nature; however, future researchers may of course wish to establish a teacher instrument that can be directly compared to the student instrument.

The teacher questionnaires, like the student instruments, were based on the five explanatory categories outlined by Gambell and Hunter (1999): evaluative bias, home socialization, role and societal expectations, gender psychology and equity policy. The teacher questionnaires were constructed such that the first 56 questions addressed these five categories, with each item offering two answer choices. Items 57 through 92

addressed the five categories as well, but with only “girls/female students” and “boys/male students” as the possible choices for each item. These last 36 items generated a high number of non-responses, with teachers commenting on the questionnaire that they would have preferred a “neither” or “both” choice. Thus, the last section of the teacher questionnaire was not used in exploring the present research question, as discussed earlier.

There were 36 teacher-participants, representing a range of experience: 0 to 3 years ($n=2$), 4 to 10 years ($n=9$) and over 10 years ($n=19$). Six participants did not indicate their level of experience. Twenty-four of the teacher-respondents were female, 12 were male.

In studying the first 56 items of the teacher questionnaire, only items where 80% or more teacher-participants chose the same answer were examined, in order to explore whether teachers and students felt strongly about similar issues. These items were spread across the five explanatory categories. After having identified items with an 80% or better agreement rate among teachers, related student items were studied by examining mean scores, and whether they were statistically significant based on grade, gender or achievement level. ANOVA was used to test the effects of these independent variables. Although the teacher items were not necessarily directly comparable to the student items, some of the items dealing with similar issues on both instruments showed interesting differences between teacher and student perceptions.

Evaluative Bias

There were five items in the evaluative bias section of the teacher questionnaire that elicited an agreement rate of over 80% among teachers, although only four suggested

varying degrees of discrepancy between teacher and student perceptions of similar issues (see Table 13).

Table 13. Related Teacher and Student Items in the Evaluative Bias Category

Teacher item	Student item
5. Students who are more distractible during exams tend to be: (a) higher achievers; (b) lower achievers	1. Classroom noises do not normally distract me much when I write an exam.
6. I reserve most of my written comments to students for: (a) written assignments; (b) report cards	7. I am often unsure of how my teachers come up with my mark or grade, and; 18. I usually understand why I receive a particular mark/grade on assignments.
14. Students who don't understand their mark/grade on an assignment tend to: (a) complain to me or their friends; (b) approach me to discuss the matter	77. When I disagree with something at school, I make a point of telling my teacher(s).
15. I tabulate report card marks from: (a) a combination of assignment and exam marks, and participation/effort marks; (b) assignment and exam marks only	14. I think my marks for effort generally raise my overall average.

For item 5 on the teacher questionnaire ("Students who are more distractible during exams tend to be"), 34 of the 36 respondents chose "lower achievers" over "higher achievers". However, the corresponding student item, # 1, ("Classroom noises do not normally distract me much when I write an exam") did not produce statistical significant results based on achievement level main effect, $F(1, 151) = .02, p = .98$, nor any interaction effects involving achievement level.

For item 6 on the teacher questionnaire, (“I reserve most of my written comments to students for”), 32 of the 36 respondents chose “written assignments” over “report cards”. Although there was no direct equivalent on the student instrument, student item 7 stated “I am often unsure of how my teachers come up with my mark or grade” and item 18 stated “I usually understand why I receive a particular mark/grade on assignments”. ANOVA was computed for both items – for item 7, statistical significance was reached for achievement level, $F(2, 151) = 8.08, p < .01$, but not for grade or gender. Upon closer examination, 69% of the low achievement group agreed or strongly agreed with the statement, while only 41% of the medium group and 23% of the high group agreed or strongly agreed. On item 18, ANOVA also showed statistical significance for only achievement level. When observed more closely, 80% of the students in the high achievement level agreed or strongly agreed with the statement, while only 59% of the medium and 38% of the low group agreed or strongly agreed.

Item 14 on the teacher questionnaire stated, “Students who don’t understand their mark/grade on an assignment tend to” – 34 of the 36 teacher-participants chose “approach me to discuss the matter” rather than “complain to me or their friends”. The student instrument, item 77, “When I disagree with something at school, I make a point of telling my teacher(s)”, was more general than the teacher version, but only 83 of the 153 participants (54%) agreed or strongly agreed with the statement, while 27% were unsure. ANOVA revealed no statistically significant main or interaction effects for either grade, gender or achievement level for this item.

Item 15 on the teacher questionnaire stated, “I tabulate report card marks from” – 33 of the 36 respondents chose “a combination of assignment and exam marks, and

participation/effort marks” over “assignment and exam marks only”. There was no direct equivalent on the student instrument, although 54% of students agreed or strongly agreed with item 14 on the student instrument, “I think my marks for effort generally raise my overall average”, with 31% being unsure and 16% disagreeing or strongly disagreeing. On a similar item, 64% of students disagreed or strongly disagreed with item 25 (“My participation marks generally bring down my overall average”), with 18% being unsure and 18% agreeing or strongly agreeing. Neither item showed any statistically significant results when ANOVA was computed for the three independent variables.

Home Socialization

Teachers appeared to have strong opinions on home socialization items, as each of the nine home socialization items in the first section of the teacher questionnaire elicited an agreement rate of 80% or better. However, only two of those items displayed discrepancies when compared to corresponding student perceptions (see Table 14). Item 26 on the teacher questionnaire, “Once students reach high school, parents’ involvement in their child(ren)’s education”, produced a 94% agreement rate with the choice of “decreases” as opposed to “increases”. Similar results were found for item 27 of the teacher questionnaire (“Parents’ involvement in their children’s education appears to”): 86% of teachers chose “change as their children get older” as opposed to “remain constant over time”. However, for item 44 of the student instrument, “My parent(s) involvement in my education has decreased as I’ve gotten older”, only 31% of the students agreed or strongly agreed with the statement, and 50.3% of the students disagreed or strongly disagreed with the statement. Similarly, 67% of students responded that their parent(s)’ involvement had remained fairly constant since elementary school by

choosing “agree” or “strongly agree” on item 43 of the student instrument. Sixteen percent of students chose “disagree” or “strongly disagree” on this item. When ANOVA was run on items 43 and 44 of the student instrument, there were no statistically significant main or interaction effects for grade, gender, or achievement level.

Table 14. Related Teacher and Student Items in the Home Socialization Category

Teacher items	Student items
27. Parents' involvement in their children's education appears to: (a) remain constant over time; (b) change as their children get older	43. My parent(s)' involvement has remained fairly constant since elementary school, and; 44. My parent(s)' involvement in my education has decreased as I've gotten older.
20. During parent-teacher interviews/three-way conferences, I would say that more parents of: (a) younger students attend; (b) older students attend	37. My parent(s) generally attend parent-teacher interviews/three-way conferences.

When asked specifically about parent-teacher interviews and three-way conferences, both students and teachers agreed that for the most part, parents of younger students attend. Ninety-seven percent of teacher respondents felt more parents of younger students attend (item 20 on teacher questionnaire), while 73% of the grade 9 student respondents reported that their parents generally attend parent-teacher interviews/three-way conferences (item 37 on student instrument). This percentage is approximately 20% higher than the reported parental participation rate by students in other grades (54% for grade 10, 52% for grade 11, and 55% for grade 12). Nonetheless, ANOVA results indicate that these differences are not statistically significant, with the difference between grade 9 and grade 11 students being the closest to significance at $p = .07$ (Tukey's HSD).

Role and Societal Expectations.

Only two of the nine items about role and societal expectations in the first part of the teacher questionnaire reached an agreement rate of 80% or better (see Table 15). For item 35 of the teacher questionnaire, “High achieving students tend to be”, 86% of the teacher participants chose “fairly popular” instead of “fairly unpopular”. The second teacher item that reached a high agreement rate among teacher respondents (item 36, stating “Female students appear to”), 97% of teachers chose “support each other to try hard in school” over “mock each other when their peer(s) try hard in school”.

Table 15. Related Teacher and Student Items in Role and Societal Expectations Category

Teacher items	Student items
35. High achieving students tend to be: (a) fairly popular; (b) fairly unpopular, and;	57. My friends make fun of me if I try hard in school.
36. Female students appear to: (a) support each other to try hard in school; (b) mock each other when their peer(s) try hard in school	Same as above

Although item 57 of the student instrument can only be taken as indirectly related to the former teacher items, it states, “My friends make fun of me if I try hard in school”.

Seventy-five percent of student participants disagreed or strongly disagreed with this statement, with only 15% agreeing or strongly agreeing. Based on ANOVA, this item did not produce statistically significant gender differences, $F(1, 152) < .01, p = .995$.

Gender Psychology

There were four gender psychology items in the first part of the teacher questionnaire that reached an 80% agreement rate or better from teachers, although these

items had varying degrees of comparability with student items, with one item having no student equivalent (teacher item 44, see Table 16).

Table 16. Related Teacher and Student Items in the Gender Psychology Category

Teacher items	Student items
38. In general, students: (a) can relate to their teachers; (b) feel teachers are out of touch	62. I believe my teacher(s) generally understand me, and where I am coming from.
37. When around me, my students: (a) act according to the guidelines I established; (b) act according to their desire, and;	68. I sometimes get into trouble with my teachers for my disruptive behaviour, and;
42. Overall, I think students prefer: (a) strict teachers; (b) laissez-faire teachers	71. I think my teachers see me more as a discipline problem than a learner.

Item 38 on the teacher questionnaire was the only item with a high agreement rate that had a student equivalent. The teacher item, “In general, students”, elicited an 86% agreement rate for “can relate to their teachers” compared to “feel teachers are out of touch”. Student item 62 stated, “I believe my teacher(s) generally understand me, and where I am coming from” – 59% of students agreed or strongly agreed with the statement, while 21% of students disagreed or strongly disagreed. ANOVA indicated that there were no statistically significant main or interaction effects for grade, gender, or achievement level relating to this item.

The other teacher items with an agreement rate of 80% or higher only had indirect counterparts on the student instrument. For example, teacher item 37, “When around me, my students” elicited a 94% agreement rate from teachers for “act according to the guidelines I established” rather than “act according to their desire”. Also on the teacher

questionnaire, 83% of teachers chose “strict teachers” over “laissez-faire teachers” in response to item 42, “Overall, I think students prefer...”. Both of these items deal to some extent with classroom management and student behaviour. The student items best relating to these issues are items 68, “I sometimes get into trouble with my teachers for my disruptive behaviour” and 71, “I think my teachers see me more as a discipline problem than a learner” on the student instrument. Results indicated that not all groups of students may perceive discipline or their student behaviour the same way. ANOVA showed a main effect for achievement level that reached statistical significance, $F(2, 151) = 2.84$ $p = .06$ on item 68. Upon closer examination, Tukey’s HSD showed a statistically significant difference between the medium and the high achievement groups ($p = .03$) with 24% of the medium achievement group agreeing or strongly agreeing, compared to 44% of the high achievement group. Item 71 also produced statistically significant results for achievement level based on ANOVA, $F(2, 151) = 6.10$, $p < .01$. Tukey’s HSD was $p < .01$ between the low group and the high group, and $p < .01$ between the medium group and the high group. Forty-six percent of the lower achieving students agreed or strongly agreed with the statement, while 29% of the medium group did, and only 9% of the highest achieving students did so.

Equity Policy

Only one equity policy item in the first part of the teacher questionnaire reached an 80% or better agreement rate (see Table 17). Item 56 stated, “More of the positions of authority at my school are occupied by”, with 94% of teachers responding “men” rather than “women”. Although there is no student equivalent, the importance of the teachers’

responses on this item has bearing on the question of equitable schooling, and will be discussed in the next chapter.

Table 17. Related Teacher and Student Item in the Equity Policy Category

Teacher item	Student item
56. More of the positions of authority at my school are occupied by: (a) women; (b) men	(No student equivalent)

Summary

In order to study the potential factors underlying boys' and girls' differential achievement, the overall research question, "How do the five possible explanatory categories identified by Gambell and Hunter apply to the differential achievement between boys and girls in urban Saskatchewan secondary schools?", was addressed through three questions. The first, "What is the effect of gender, achievement level, and grade on each of the five explanatory categories?", was addressed by using a chi-square test and comparing the mean responses for each category, for grade, gender and achievement groups. A MANOVA was used to examine statistically significant effects of these three independent variables. No interaction effects were found, and only achievement level showed a main effect.

The second sub-question, "To what extent is there a relationship between the evaluative bias, home socialization, role and societal expectations, gender psychology, and equity policies?", was explored using Pearson's product-moment correlations, which showed that several of the categories were correlated in some way, some positively, some negatively. In general, students who felt supported to achieve well in school from both

home and school also felt a good student-school fit, perceived low evaluative bias, and felt there were equitable learning opportunities at school. The converse was also true.

Finally, student and teacher perceptions of the five categories of explanations were examined by comparing teacher items producing a high level of agreement to related student items. Follow-up analyses using ANOVA provided additional information on the perceptions of students on the five explanatory categories. All in all, there were no major differences in perception between teachers and students, except on a few items. Low achieving students' perceptions, however, were different from their counterparts' on a number of items.

CHAPTER FIVE

Discussion and Interpretation of Results

In exploring the potential sources of influence on high school students' academic achievement, the explanatory categories presented by Gambell and Hunter (1999) were used as a theoretical foundation. Thus, the five categories of explanations explored in this study were: evaluative bias, home socialization, role and societal expectations, gender psychology and equity policy. The results of this study are discussed in this chapter, along with the contributions and implications of the present study on research about differential academic achievement. First, the effects of grade, gender and achievement level are discussed, followed by a discussion of the relationships among the categories and finally, a look at teachers' and students' perceptions. The chapter ends with a number of conclusions and implications for further study.

Grade, Gender and Achievement Level

Three independent student variables were established in this study – grade, gender and achievement level. The data were examined for students as a total group, and for each of the three independent variables, in order to explore any potential group effects on students' response patterns.

The chi-square test results indicated that when students were divided according to gender and grade, observed responses did not deviate significantly from expected values, such that no group represented a skewed response pattern. However, when looking at students' self-reported achievement level, the difference between observed and expected values did reach statistical significance ($\chi^2 = 74.10$, $df = 2$, $p < .01$). This may be due to

the small representation ($n = 13$) in the low achievement group, represented by an academic average of less than 60%. The medium and high achievement groups were better represented with 41 and 98 students, respectively. In other words, there were not necessarily enough participants in the low achievement group to form a normal curve representing low achievers in general. The small size of the low achievement group may also explain the difference in responses that this group represented compared to the other demographic groups, as only achievement level showed a main effect based on MANOVA results, $F(10, 248) = 3.18, p < .01$. Nonetheless, all groups exceeded the .05 significance level for Box's test of equality of covariances, suggesting that the responses of participants in the low achievement group did not represent a wider spread than did responses of students in other groups. This result suggests that despite the small size of the low achievement group, the null hypothesis cannot be rejected based solely on group covariances.

As a follow-up to the initial multivariate analyses, ANOVA tests were conducted for all items in the evaluative bias, gender psychology and equity policy categories, as these showed statistically significant main effects for achievement level.

Evaluative Bias

In the evaluative bias category, MANOVA results indicated that the differences between the high and low groups, as well as between the high and medium groups, reached statistical significance, based on each group's mean category scores. Upon closer examination using ANOVA for each individual item, 11 of the 26 items showed statistically significant differences between achievement groups. For each of these 11

items, the high achievement group's mean response was significantly different from that of the low achievement group, based on post hoc tests using the Bonferroni value.

For item 2, only the low group disagreed with the statement, "On exams, my teacher(s) usually indicate how each question is weighted/evaluated". This response was significantly different from both other groups. Thus, it appears that low achievers are more uncertain as to the logistics of classroom assessments than their higher achieving counterparts. Item 2 falls within Theme III ("Judging and scoring student performance") of the *Principles for Fair Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993). More specifically, it corresponds to guideline 3 of this theme:

"Before an assessment method is used, students should be hold how their responses or the information they provide will be judged or scored" (p. 7). In theory, prior information helps ensure that students and teachers have similar expectations. The results of item 2 raise the question of whether low achieving students and their teachers share similar expectations, whether teachers are communicating assessment strategies in a way that is inaccessible to lower achievers, or whether the latter do not retain the information as readily as their classmates.

For item 4, the results were similar, although in this case, the low achievement group was the only group to *agree* with the statement ("Generally speaking, I disagree with my teachers' comments on my report card"). This item corresponds to Theme IV of the Joint Advisory Committee (1993) document, "Summarizing and interpreting results". Although students' agreement with report card comments is not necessarily a reliable measure of the value of assessments, the Joint Advisory Committee (1993) does indicate that "the way in which summary comments and grades are formulated and interpreted

should be explained to students and their parents/guardians” (p. 9). Thus, students should at least understand how their marks are interpreted. The fact that in this study, low achievers generally disagree with their teachers’ comments on their report cards reflects an obvious difference in perception. Whether this difference is borne of a lack of understanding of how assessments are interpreted is an important consideration for classroom teachers.

For item 6, the difference between the low and high group mean responses was statistically significant ($p < .01$), but so was the difference between the medium and high groups ($p = .05$). In fact, the high achievement group was the only group to disagree with the statement (“I am often surprised by the questions on exams”). Item 8, “I am usually confused by the questions on exams”, was very similar to item 6. Again, only the high achievement group disagreed with the statement, differing from both the medium and low groups. Another related item, “I usually understand the questions on a test” (item 17), reached statistical significance for achievement level as well. For this item, the high group’s mean response was statistically different from that of both other groups, although they all agreed with the statement overall. Finally, for item 26 (“Often, I don’t understand what my teacher(s) want me to do for assignments”), the high achievement group disagreed with the statement overall, while the other two groups agreed. The differences in mean responses were statistically significant between the high group and both other groups.

Items 6, 8, 17 and 26, described above, corresponded to one of the guidelines under Theme II (Joint Advisory Committee, 1993): “Students should be told why assessment information is being collected and how this information will be used”.

Although exact exam questions cannot often be revealed without compromising the validity of the assessment, students should be aware of the general information that will be asked of them. Based on the results of this study, it appears that apart from high achieving students, many students are either surprised or confused by the content of their exams. Beyond looking at the vocabulary used in exam questions, these results lead one to wonder whether high achievers seek this information from the teachers or in their course outlines independently, or whether they are the only group of students to retain the information when teachers present it. An alternative explanation is that teachers may hint rather than state what will appear on an exam, with the belief that outright statements compromise the validity of their exam, and that only higher achievers pick up on the hints. However, this runs counter to the philosophy expressed in *Principles for Fair Assessment Practices for Education in Canada* (1993).

Item 7 was unusual in that it was the only item where the differences in mean responses between all three groups reached statistical significance. As with items 6 and 8, only the high achievement group disagreed with the statement of item 7, “I am often unsure of how my teachers come up with my mark or grade”. This statement corresponds to Theme V: “assessment reports should be clear, accurate, and of practical value to the audiences for whom they are intended” (Joint Advisory Committee, 1993, p. 11). Items 13 and 18 also relate to this principle, as well as to Theme V: “Comments formed as part of scoring should be based on the responses made by the *students* and presented in a way that students can understand and use them” (italics in original, Joint Advisory Committee, 1993, p. 8). Item 13 states, “I normally know why I get a particular mark/grade on tests”, and item 18 states, “I usually understand why I receive a particular mark/grade on

assignments”. ANOVA results in both cases pointed to statistically significant group effects, with the differences being particularly pronounced between the low and high achievement groups for item 18. For both items, however, all mean responses fell above 3, indicating overall agreement with the statement by all groups.

The fact that all groups agreed with statements addressing their understanding of how they got particular marks/grades, in particular on items 13 and 18, is encouraging. Interestingly, only high achievers disagreed that they were unsure about how their teachers came up with their marks/grades” (item 7). These items are obviously all very similar, but they suggest conflicting perceptions. From a measurement point of view, the inconsistencies may lie in the measurement properties of this research. From a theoretical perspective, it is possible that some students are losing track of how their grades are tabulated, or why they earned certain grades. This may result from unclear prior expectations, from sketchy written comments by teachers, or by a combination of learning and teaching factors. What is clear is that the assessment grids and rubrics, as well as written comments, must be clearly communicated to students, especially those achieving in the low to average range.

Item 12 produced results where the high achievement group’s responses differed significantly ($p < .01$) from those of the other two groups. Here, only the high achievement group agreed with the statement (“I normally do well on long answer questions”). This item related to the development and choice of assessments, as was item 16, “I usually do well on short answer questions”. On the latter item, only the low achievement disagreed with the statement. When looking at the results of both items 12

and 16, the low group disagreed with statements regarding success on both short and long answer questions.

The Joint Advisory Committee (1993) recommends using more than one assessment method, as well as methods “suited to the backgrounds and prior experiences of students” (p. 4). Special needs are listed as one of these background factors, and although the lower achieving participants in this study were not necessarily receiving program modifications, the implications of using a variety of appropriate assessment strategies are obvious when many students with special needs struggle academically. The fact that in this study, only high achievers expressed that they did well on long answer questions has many potential explanations, such as verbal skill, concept mastery, or time management.

The relatively high number of evaluative bias items showing statistically significant group differences, generally between the low and high achievement groups, points to a potential area of improvement in the education system. Obvious areas include clear communication of assessment methods, and clear results and comments. However, student-related factors may also be at play. Wolters (1999), for instance, found that “students’ use of motivation regulation strategies could be used to predict their use of learning strategies, effort, and classroom performance” (p. 281). Wolters (1999) studied five motivational regulation strategies, described as Self-Consequating, Environmental Control, Performance Self-Talk, Mastery Self-Talk, and Interest Enhancement, and he found that:

“only one of the motivational regulation strategies (i.e., Performance Self-Talk) was related to students’ classroom performance as indicated by teacher-reported

grades. On the other hand, the motivational strategies, as a group, explained a significant portion of the variance in students' semester grades" (p. 293).

Consequently, pointing solely to teacher and school responsibilities with regards to assessment concerns may be too one-dimensional to be effective. Addressing significant student factors, such as motivational regulation, among students at various achievement levels, may be another useful avenue in both research and practice.

Gender Psychology

As with evaluative bias items, the gender psychology category showed statistically significant group effects for achievement level when preliminary MANOVA tests were conducted. Thus, all the items in the category were analyzed on an individual basis using an ANOVA. Post hoc tests, using the Bonferonni test, were also conducted in order to discern where significant group differences were manifest.

Following the ANOVA tests, nine of the 20 items reached statistical significance for achievement level main effects. Of these, item 61 ("I am a patient person when it comes to getting along with my teachers and classmates"), item 68 ("I sometimes get into trouble with my teachers for my disruptive behaviour"), and item 71 ("I think my teachers see me more as a discipline problem than a learner") all related to the trait of aggression⁹. Bonferroni's post hoc test confirmed significant differences between the responses of the low and high achievement groups for item 61. Both the medium and high groups agreed with the statement, but the low achievement group had a mean response of 3.00. This suggests that they are either unsure or fairly neutral on the subject. In other words, although aggression is posited by some to be a traditionally masculine

⁹ All traits based on sociobiological concepts (Kilmartin, 1994), see Chapter Two.

characteristic (Kilmartin, 1994; BSRI, 1974), it did not yield gender differences, but rather achievement level differences in this study. Although lower achievers had a statistically significantly lower mean response than their counterparts, suggesting a potentially higher level of aggression, their mean score was still 3.00. Further, it is difficult to make sweeping generalizations about one item.

Surprisingly, for item 68, only the high achievement group agreed with the statement, with differences between the medium and high groups reaching statistical significance. Thus, despite evidence that low achieving students are often at higher risk for discipline problems (see Aunola, Stattin & Nurmi, 2000, for a discussion of adolescents' achievement strategies and problem behaviours), only high achievers agreed that they sometimes get into trouble for their disruptive behaviour. It is difficult to ascertain whether this response pattern is due to high achieving students' more realistic perceptions, but certainly these results run counter to other researchers' findings:

The influence of an adolescent's peer group was found to explain student behavior throughout the high school years better than any other variable. Having academically-oriented friends seemed to encourage students to behave well and to help them resist drugs and alcohol. Negative peer influence seemed to greatly increase a student's risk for behavior problems and substance abuse (Giancola, 2000, p. 1).

In contrast to item 68, all three groups disagreed with item 71, with the high group disagreeing more strongly – the Bonferonni value reached significance, $p < .01$, between both high/low and high/medium groups. In other words, despite their responding that they sometimes get into trouble for high achievers' disruptive behaviour, their

response to item 71 suggests that they do not feel they are perceived as a discipline problem rather than as a learner.

Items 63, 69 and 70 related to the masculine trait of dominance. For item 63 (“I prefer to be the leader during group work”), all three achievement groups agreed overall with the statement, as represented by mean scores of over 3. Despite statistical significance in the ANOVA test, the Bonferroni test showed no statistically significant differences between groups for this item. In contrast, items 69 (“I strive to get one of the highest marks in the class on exams”) showed statistically significant differences between the low and high groups, with only the low group disagreeing with the statement. For item 70 (“I strive to get one of the highest marks in the class on assignments”), all three groups agreed with the statement. Nonetheless, there were statistically significant group differences between the medium and high groups, with the high group expressing stronger agreement. The results of items 69 and 70, then, hint at the role of motivation, as discussed above. In other words, a comprehensive study of group differences might include internal student factors such as motivational regulation, as an alternative to a focus on masculine traits such as dominance.

Items 66 and 67 related to the trait of risk-taking. All three achievement groups agreed with item 66 (“I like trying new activities and learning opportunities at school”), although again, there were statistically significant group effects, specifically between the low and high groups. In this case, the higher achievers expressed stronger agreement than the low achievers. There were statistically significant effects for item 67 as well (“I prefer the school routine to stay constant rather than change a lot”). For this item, both the medium and high groups showed overall agreement, but the low group’s mean response

fell below 3, indicating overall disagreement with the statement. The Bonferroni test showed that the statistically significant difference was between the low and medium groups ($p = .01$), with the high achievement group's mean response falling between those of the other two groups. This result suggests that the low achievement group was the only group to prefer change to constant routine, yet their mean response to item 69, related to trying new activities at school, was lower than that of the other two groups. Thus, although lower achievers expressed liking a degree of change, they do not appear to favour high-risk activities, although this preliminary interpretation is difficult to ascertain based on these two items alone.

Finally, item 76, "There should be no grades in school – everyone should just pass or fail", was designed to reflect the trait of competition. All groups disagreed with the statement, but group effects nonetheless reached statistical significance. More specifically, the Bonferroni value was statistically significant between the medium and high achievement groups, $p = .01$, with the high achievement group's mean response showing the strongest disagreement at 2.18. Thus, although it appears from this item that all students might favour a competitive assessment framework, this is a difficult conclusion based solely on this item, as the other two items relating to competition did not show statistically significant group effects.

Equity Policy

The final explanatory category that showed statistically significant achievement level effects using MANOVA was that of equity policy. The items in this category were based on the STF's guidelines regarding equity (section 6.8.3): "a) delegation of responsibilities in the school; b) school programs and offerings; c) curricula; d)

instructional materials; e) extra-curricular activities or; f) other areas in which discrimination is reinforced or perpetuated” (STF, 2000, p. 106).

Only five of a possible 19 items within this category showed statistically significant achievement level effects, based on follow-up ANOVA tests. Items 81 (“Both female and male students have an equal chance of succeeding academically at school”) and 98 (“The school provides better learning opportunities to female students”) both related to the concept of equitable opportunities within the school. Although the initial MANOVA results showed no statistically significant gender effects in this category, achievement level was found to mediate student responses to equity policy items. In the case of item 81, all three groups agreed that female and male students have an equal chance of succeeding academically, but the high achievement group had a statistically significantly stronger level of agreement than both the other groups. The results of item 98 are similar to those of item 81, in that all three groups disagreed with the idea that the school provides better learning opportunities to female students. The high achievers disagreed most strongly with the statement, but the Bonferroni test results did not attain statistical significance between any of the groups. All in all, these results are difficult to interpret because all groups either agreed or disagreed overall with the same statements, with the high achievement group expressing stronger views.

Items 89 and 93 related to the choice of instructional materials, as the STF’s *Statement of Policy and Bylaws 2000-2001* recommends that teachers seek “to eliminate discrimination and bias that may exist in ‘instructional materials, as well as other areas of education (STF, 2000, p. 106). Item 89, “I understand the textbooks used in most of my courses”, was designed to explore whether textbooks typically used in classrooms are

equitable in their degree of clarity, such that certain groups are not unduly disadvantaged by these materials. For this item, both the medium and high group agreed overall with the statement, but the low achievement group's mean fell below 3. There were also statistically significant differences between the medium and high groups, as well as between the low and high groups. This suggests that as a student's achievement level increases, so does the comprehensibility of textbooks. This points to a potential source of inequity, as it also relates to one of the concepts of fair assessment: "assessment methods should be clearly related to the goals and objectives of instruction, and be compatible with the instructional approaches used" (Joint Advisory Committee, 1993, p. 4). Insofar as an assessment is designed to evaluate students' understanding of concepts by using excerpts from textbooks, teachers should be certain that extraneous variables are not unduly influencing student results, such as a greater grasp of vocabulary not directly related to the concepts, or reading speed.

Also related to teachers' choice of instructional materials, item 93 stated, "My teachers use interesting materials in their teaching". This item was also designed to touch on Gambell and Hunter's (1997) concern about reading materials the classroom:

We ask whether gender equity in literature selection has promoted reading material of little or no interest to males. More opportunity for male identification with texts and more appealing narrative genres are needed to better engage male readers of all school ages (p. 13).

Although no statistically significant gender differences emerged in initial MANOVA tests of the explanatory category of equity policy, ANOVA tests confirmed the presence of statistically significant group differences between achievement groups. Only the low

achievement group agreed overall with the statement, although group differences only reached statistical significance between this group and the medium group. This result may reflect lower achievers weaker understanding of their texts (item 89), or their weaker understanding may result in part from their disinterest in the materials used, hinting again at the role of motivation discussed earlier (see Wolters, 1999).

Students' perceptions of the role of extracurricular activities within the school were also explored, as this area was identified in the STF (2000) document as being an area where discrimination and bias should be eliminated. There were three items in the category relating to extracurricular activities such as art, athletics, and other general activities. Of these three items, only item 90 reached statistical significance for achievement level group effects. It stated, "I think my teachers generally see the value of extracurricular art activities", with only the low achievement group disagreeing with the statement. The Bonferroni test confirmed that their mean response was statistically significantly different from that of both the other achievement groups. This result is difficult to explain, given that the other two items relating to extracurricular activities did not show group effects, but it does provide an interesting data point for further study into the way education is delivered, especially where lower achieving students are concerned.

Explanatory Categories

Beyond exploring the group differences or similarities among students in response to various items or categories of items, another goal of this study was to explore whether any of the categories would be statistically correlated. This research goal arose out of the observation that many of the theories informing the five categories of explanations shared overlapping constructs. For example, the influence of home, whose items belonged to the

home socialization category, is difficult to tease apart from role and societal expectations, given that the home is part of a larger society. Also, assessment practices are often informed by varying philosophies, such as learning style theory or gender stereotypes. As well, there are many other factors potentially influencing students' achievement and the assessment instrument's validity. Consequently, it was hypothesized that there would be some degree of correlation between the five categories of explanations.

As seen in Table 9, a number of explanatory categories were correlated to each other, often reaching statistical significance (correlation, $p < .01$). For example, there was a negative correlation between evaluative bias scores and role and societal expectations scores ($r = -.26$). This indicates that students with a high score in the evaluative bias category, which suggests a high perception of bias, would likely report a low support for school by their teachers and/or peers, as represented by a lower score on the role and societal expectations category. Conversely, students who feel supported to succeed academically by their teachers and peers are not as likely to perceive evaluative bias in the classroom. These findings may reflect the fact that teacher-student relations show a positive and statistically significant association with student performance (OECD, 2000, "What can schools do to make a difference?"). Thus, students who relate well to their teachers and who feel supported may achieve better as well as be less likely to perceive bias.

There was also a significant negative correlation between evaluative bias scores and gender psychology scores ($r = -.28$). Thus, students with a high score in the evaluative bias category, suggesting a high perception of bias, would have a lower score in the gender psychology category, suggesting a potentially weak student-school fit. The

reverse would also be the case, with students reporting low perception of bias in the classroom also reporting feeling a good “fit” at school. It could be that students who do not feel they fit well with the way the school functions perceive a greater degree of bias, independently of whether there is actually a bias against them or others in the classroom. However, it could also be that students who perceive subtle hints of evaluative bias in the classroom feel less at home in the school culture *as a result*. Whatever the case, students who do feel a good student-school fit are less likely to perceive bias in the classroom.

There is yet another negative correlation, between evaluative bias scores and equity policy scores ($r = -.47$). This suggests that students who perceive bias in the classroom do not perceive overall equity at the school level. This could indicate that the students who sense bias in one area, such as the classroom, sense it in other areas as well, such as at the school level. Alternately, students who feel they have been biased against in one instance could be projecting the perceived bias more globally. This finding raises an interesting question regarding the influence of evaluative practices within and beyond the classroom. The Saskatchewan Teachers’ Federation (STF), in its *Statement of Policy and Bylaws 2000-2001*, makes no mention of assessment practices in its section on gender equity, and no mention of equity in its section on student evaluation (STF, 2000). The negative correlation between evaluative bias and equity policy in this study suggests that a new way of conceptualizing both equity and assessment practices may be in order, whereby these constructs are treated as interrelated rather than mutually exclusive.

Home socialization scores were positively correlated with role and societal expectations scores ($r = .26$), gender psychology scores ($r = .37$), and equity policy scores ($r = .36$). In the first instance, the positive correlation indicates that students who

report high home support of academic success generally report high support from teachers and peers as well. This result may reflect individuals' tendency to gravitate towards similar kinds of people (Collins, et al., 2000), or it might suggest that students who feel unsupported do so both at home and at school. It is difficult to know whether this is a case of actual or perceived non-support.

The positive correlation between home socialization scores and gender psychology scores suggests that students who report a high home support of academic success also report feeling a good student-school fit. This result might reflect the power of home support in school adjustment (Maccoby, 1992), although the MANOVA results did not indicate any main or interaction effects for achievement level, grade or gender on home socialization scores. However, the high achievement group did show statistically significant differences with the low group on gender psychology items ($p < .01$), with high achieving students reporting a better student-school fit (higher gender psychology score). This finding supports Steele's (1997) argument that "to sustain school success one must be identified with school achievement", and that "if this relationship to schooling does not form or gets broken, achievement may suffer" (Steele, 1997, p. 613). In other words, it may be that the high achieving students in this study feel stronger school identification than low achieving students, as measured in part by student-school fit.

Finally, the positive correlation between home socialization scores and equity policy scores indicates that students who report high home support of school success also perceive there to be equity at the school level. Again, this suggests that home support leads to good school adjustment and positive perceptions of the school environment (as represented in part by equity policy items), but again, there were no statistically

significant effects by any of the independent variables on home socialization scores. The MANOVA results did indicate, however, that low achievers perceive statistically significantly less equity at school than medium and high achievers. This, again, may reflect school disidentification by low achievers, due to real or perceived inequities at the school level, such as achievement stereotyping (see Steele, 1997, for a discussion of the effects of achievement stereotyping on school identification).

A positive correlation ($r = .41$) was found between role and societal expectations scores and gender psychology scores. Thus, students who report feeling supported to succeed at school by teachers and peers also feel a good student-school fit, which is consistent with the positive correlation between home socialization scores and gender psychology scores, and home socialization and role and societal expectations scores.

Students' scores on the category of role and societal expectations was also positively correlated with their equity policy scores ($r = .34$). This indicates that students who report feeling supported to achieve well in school by teachers and peers feel that they are receiving equitable learning opportunities. In fact, gender psychology scores are also highly correlated with equity policy scores ($r = .61$), meaning that students who feel a good student-school fit feel they are receiving equitable opportunities at school. Given the positive correlation between role and societal expectations and gender psychology, these results are in keeping with those discussed earlier.

Overall, then, students who feel supported at home also tend to feel supported by teachers and peers, to perceive a lower degree of bias in the classroom, to feel a good student-school fit and to perceive school as providing equitable opportunities. The converse is also true, with students feeling less supported at home likely to feel less

supported by teachers and peers, less well suited to school, to perceive bias in the classroom and to report a lower perception of equity at the school level. This suggests that some students are generally faring well in school, while others appear less well adjusted to school. However, it is important to remember that MANOVA found no statistically significant main or interaction effects on any categories for grade or gender. Achievement level showed a main effect for evaluative bias, gender psychology and equity policy categories, but the low achievement group was small ($n = 13$), calling into question the interpretation of this statistically significant effect.

Differences in Perception

This part of the study was more exploratory in nature, due to the differences between the teacher and student instruments. The teacher questionnaire, which was forced judgement style, and the student instrument, which was a Likert-type scale, were only indirectly comparable because of their different formats and because not all items on one instrument had a direct equivalent on the other. However, both instruments were constructed based on the five explanatory categories proposed by Gambell and Hunter (1999), so an exploration of items related to similar constructs was conducted.

In the evaluative bias category, the item with the most notable discrepancy between teacher and student perceptions concerned students' distractibility during exams. To illustrate, 94% of teachers felt that lower achievers were more distractible during exams than higher achievers. This is consistent with Arsenault's (2001) findings:

...Children with low academic self-concept were reported to manifest less persistence and higher distractibility than those who reported high academic self-concept. In addition, children with higher intelligence and greater academic

achievement displayed higher academic self-concept than their counterparts” (p. 3).

However, ANOVA results based on student responses to a similar question yielded no statistically significant effects for grade, gender or achievement level. In other words, students do not perceive that they are more distractible based on their achievement level, whereas teachers appear to. In any case, boys’ academic achievement does not appear particularly affected by distractibility during exams, as gender did not produce a main effect, $F(1, 152) = .35, p = .55$ for the corresponding student item 1, nor any interaction effects.

In relation to teacher comments and students’ understanding of how their grades are derived, 89% of the teacher–respondents indicated they provide most of their written comments on students’ assignments rather than reserving all comments for the report card. Although there was no directly comparable student item, it appears that despite teachers’ written comments, lower achievers are still statistically significantly more unsure of how their teachers tabulate their grades than medium and higher achievers, based on results of student item 7. ANOVA results for student item 7 indicated an achievement main effect, $F(2, 151) = 8.08, p < .01$. The results of this item are consistent with that of item 18, which consisted essentially of the reverse wording of item 7. The latter item also indicated that high and medium achievers are clearer on how their marks are tabulated than lower achievers. Interestingly, item 7 also elicited a fairly large gender difference in mean scores, .43 on a five-point scale, although it did not reach statistical significance, $F(1, 152) = 3.82, p = .053$. More specifically, boys agreed more strongly that they were unsure of how their teachers tabulate their marks/grades than girls did.

Thus, although the findings suggest that teachers do communicate how they tabulate marks/grades, they may wish to be especially clear or even repetitive, particularly for the benefit of lower achievers and boys.

Also in relation to tabulation of marks, 92% of teachers indicated that they tabulate students' final grades based on both assignment and exam results, and effort/participation marks. There was no directly comparable student item, but approximately one in six students felt that their participation marks lowered their overall average, as 16% of students disagreed or strongly disagreed with item 14 and 18% of students agreed or strongly agreed with item 25. Based on these results, one might wonder about the value of using participation/effort marks, but ANOVA results do not necessarily indicate that teachers are using a problematic assessment approach. Neither grade, gender, nor achievement level showed any statistically significant main or interaction effects for items 14 or 25.

Finally, in relation to open communication between teachers and students, especially in relation to students' concerns about their marks, 94% of teachers felt that students were more likely to approach them to discuss their concerns rather than complain to teachers or friends. In general, students also agreed that this would be their course of action, but not to the same near unanimous degree as teachers thought. In fact, only 54% of students agreed or strongly agreed that they would tell their teachers if they disagreed with something at school. It should be noted, however, that the student version, item 77, was far more general than the teacher item, which specifically focused on concerns about grades. It could still be the case, then, that students would be very likely to discuss their grades with their teachers, with discussion of other school-related matters

being more hesitant. Thus, these teacher and student items do not necessarily flag any discrepant perceptions of immediate concern.

In relation to home socialization items, teachers overall had strong opinions, with each of the nine items on this topic eliciting an agreement rate of 80% or more. Of particular interest were items 26 and 27 of the teacher questionnaire, which both addressed parental involvement over the course of their child's development. Eighty-six percent of teachers felt that parental involvement in their children's education changed over time, with 94% of teachers indicating that parents' involvement in their children's education decreased when the latter reached high school. Interestingly, students in general did not appear to perceive this definite decline in parental involvement. In fact, only 31% of students indicated that their parents' involvement had decreased as they (students) got older, while 50.3% of students disagreed or strongly disagreed. Similarly, 67% of students responded that their parent(s)' involvement had remained fairly constant since elementary school, with 16% indicating that it had not. When ANOVA was computed for student items 43 and 44, there were no statistically significant main or interaction effects for grade, gender, or achievement level. Thus, although students generally do not have the same perception of parental involvement as teachers do, it is not a difference in perception that is specific to a certain student demographic group. This finding contradicts some researchers' suggestions that parents are actually more involved with girls than boys (Keith et al., 1998) and that parental involvement with male students is more likely to diminish with age, whereas involvement with female students remains more constant over time (Baker, 1987 in Muller, 1998). However, the items on "parental involvement" in the present study were defined by the degree of parental responsiveness

and demandingness (see the “Home socialization” section in the present chapter). It is unclear how these concepts figured in Keith et. al (1998) or Baker’s (1987) studies.

Contrary to teachers’ high agreement rates on home socialization items, only two of the nine items in the role and societal expectations category elicited an agreement rate of 80% or higher. These items addressed students’ general acceptance of high achievement. For example, 86% of teachers reported that students who do well at school are fairly popular, and 97% of teachers felt that female students support each other to try hard in school. There was no item addressing male students’ degree of support for each other’s success at school. The only student item that addressed the relationship between popularity and school effort showed that 75% of students disagreed or strongly disagreed that their friends make fun of them if they try hard in school. There were no statistically significant main or interaction effects for grade, gender or achievement level. In other words, teachers and students generally agreed with each other that students who try hard and/or succeed well in school are not mocked, but that they tend to be popular. Because gender was not a significant mediating variable, the concern that there may be a masculine imperative against school success is not supported by the findings of the present study.

There were four items in the gender psychology category of the teacher survey where 80% or more teachers chose the same response. Only one of these items had a direct student equivalent, and it addressed the degree of mutual understanding between teachers and students. To illustrate, 86% of teachers felt that students could relate to teachers. While students generally appeared to agree with their teachers on this point, the agreement rate was lower with only 59% of students agreeing or strongly agreeing that

their teachers understood them. Thus, nearly one fifth, or 21% of students expressed some degree of disagreement. The comparison of teacher and student responses suggests that while both groups of respondents generally felt that students could relate to their teachers, teachers felt more strongly that this was the case than students did. It is important to note, however, that although students and teachers expressed different *degrees* of agreement about teachers' understanding of students, they were still both in agreement.

Still in the gender psychology category, 94% of teachers felt that students generally acted in accordance with teacher rules and guidelines rather than according to their own desire. While the majority of students indicated, on related student items, that they did not feel they were seen as discipline problems rather than learners, there was a statistically significant main effect for achievement level on student items 68 and 71 in relation to behaviour. To be specific, approximately 10% more medium achievers felt that teachers saw them more as discipline problems than as learners (51%) compared to high achieving students (39%). It is notable that over half of the medium achievers felt they were perceived more as discipline problems than as learners, and still nearly 40% of high achievers did. Low achievers fell between the two groups. In other words, a large number of students across achievement groups feel they are perceived as discipline problems. Although item 68 related to the trait of aggression, which is traditionally seen as a masculine trait (Auster & Ohm, 2000), gender did not produce main or interaction effects based on ANOVA results. Also, low achievers did not vary significantly from either medium or high achievers on this item. However, significantly more low achievers agreed or strongly agreed with item 71, expressing that they sometimes got in trouble for

their behaviour compared to medium and high achievers. Thus, although low achievers reported getting into trouble 17% more than medium achievers, and 37% more than high achievers, they still did not feel they were perceived as discipline problems to the same degree as medium achievers.

The final category, that of equity policy, only produced one item with an agreement rate of 80% or more among teachers. This item, 56 on the teacher questionnaire, stated, "More of the positions of authority at my school are occupied by", with 94% of teachers responding "men" rather than "women". In popular media, concerns have been raised about the gender distribution on school staffs: "...most of our elementary and middle schools have a dearth of male teachers. This sends an early and faulty message to our boys – that education and learning are primarily for girls and women" (Pollack, 1998, p. 232). Despite these concerns, the results of this item suggest that teachers do not appear to perceive an under-representation of men, at least not in the upper echelons of high school staffs. This item reflects the Saskatchewan Teachers' Federation's (2000) recommendation that schools can help achieve gender equity for students by also aspiring to equal participation in the professional body. Although it may be true that there are generally more female teachers than male, it is possible that male students still perceive that men occupy administrative positions at school and in society. Consequently, it is possible that some boys assume, either consciously or not, that they will do well in life regardless of whether they achieve at the top of the class. It is difficult to know whether this is the case, as there was no student item addressing the gender distribution of the school staff. Nonetheless, the question of whether boys perceive the relationship between academic success and occupational outcomes differently than

female students do is an important one in research on differential achievement. Although role and societal expectations were addressed in the present study, the issue of societal power structures and role expectations outside of school form a more global perspective than that of the present study.

All in all, teachers did not have overwhelmingly strong opinions about equity policy items as a group, which was reflected by the fact that only one item in the category elicited an 80% or better agreement rate. By contrast, all items in the home socialization section of the first part of the teacher questionnaire yielded this high agreement rate. Overall, students and teachers appeared to have similar perceptions of various issues, but the degree to which they appeared to agree or disagree varied. As part of this study, teacher and student perceptions were loosely compared, in order to discover any potentially flagrant areas of disagreement. In the present study, only one item reflected discrepant perceptions, that of whether low achieving students are more distractible than high achieving students during exams. Teachers felt this was the case, while students produced no statistically significant main or interaction effects on the related student item, based on achievement level.

In the future, researchers wishing to study teacher and student perceptions may wish to construct parallel instruments using a systematic approach, such as a Q-sort or a pilot study. As such, it would be easier to directly compare the degree of congruence between teacher and student perceptions regarding categories as a whole, rather than as individual items, thereby providing some insight into the area of differential achievement in the classroom.

CHAPTER SIX

Conclusions and Implications

The results of this study indicated that there may be some areas in schools and classrooms requiring research attention in the effort to address the problem of differential achievement, but no single explanatory category, as explored in the present study, appears to explain gender differences in achievement.

There were no statistically significant differences in response patterns between students based on grade or gender for any of the explanatory categories. Therefore, based on the present results, the influence of the five explanatory categories on student achievement, while certainly important, does not appear to explain differential achievement between boys and girls. There were more inter-group similarities than differences among students, especially based on grade and gender, in the way that students responded on this instrument.

Contrary to grade and gender, achievement level did achieve statistical significance when MANOVA was computed for the mean total scores for each explanatory category. This could indicate that achievement level is a stronger mediating factor in response patterns than either grade or gender, although the small representation of students in the low achievement group ($n = 13$) may be an intervening variable. The literature discussed earlier demonstrates that boys and girls are not equally distributed in the various achievement levels, with more boys at lower levels than many girls – thus, the group effects in this study are difficult to interpret. In theory, if there are more boys in the lower achievement groups, then group effects based on achievement might plausibly

show gender effects as well, or at least a degree of interaction between these two independent variables. Thus, future researchers interested in understanding the impact of achievement level on student perceptions may wish to study this with a larger number of student participants in the low achievement group, in order to elaborate on the influences of various independent variables. Using random selection might preserve the actual proportions of male and female students in the different achievement groups, permitting a closer look at the potential for interaction effects between gender and achievement level.

Although gender differences in student perceptions were not generally evident in this study, exploring the relationships between explanatory categories yielded results that may be used by future researchers. For example, students who feel supported at home also tend to feel supported by teachers and peers, to perceive a lower degree of bias in the classroom, to feel a good student-school fit and to perceive school as providing equitable opportunities. The converse is also true, with students feeling less supported at home likely to feel less supported by teachers and peers, less well suited to school, to perceive bias in the classroom and to report a lower perception of equity at the school level.

Although these correlations did not appear to be mediated by grade or gender, they still point to the power of overall school adjustment on academic achievement and the influence of academic success on overall school adjustment. Establishing the direction of this relationship for boys and for girls is an important first step for future researchers wishing to establish a working model of the series of influences created by the five explanatory categories used in this study.

Concerning the degree of congruence between students and teachers, these two groups appeared to have similar perceptions of various issues, but to varying degrees. In

fact, only one item on each instrument reflected obviously discrepant perceptions, with teachers expressing that low achieving students are more distractible than high achieving students during exams. On the other hand, results for student achievement level did not reach statistical significance, suggesting students do not share teachers' perceptions about distractibility, regardless of their demographic groups.

Also in the evaluative bias category, the lower achievers reported a higher degree of uncertainty about how their grades and final results are tabulated than are the other two achievement groups. This suggests that although teachers are likely explaining how they tabulate grades and final results, as evidence by the reported understanding of medium and high achievers, these explanations are either unclear to lower achievers, or not retained. Although this was also true of boys to some extent, the difference between male and female students did not reach statistical significance. Thus, the question of fair assessment practices, specifically in relation to the communication of assessment criteria and goals to students, may benefit from closer examination on the part of educators and school leaders, such that all students start off with similar degrees of clarity around assessment expectations. However, the role of students' use of motivational strategies in listening to and retaining information, as well as their attributions in the event of perceived academic failure would also be crucial areas of study, as education is often the result of teacher and student *interactions*.

Other items in the evaluative bias category showed less obviously discrepant perceptions, such as whether students would approach teachers about school-related concerns. However, the teacher item relating to the use of participation and effort marks raises an interesting question. Nearly one in six students (16%) felt that their participation

marks lowered their overall average. Although this does not necessarily indicate a concern, it does suggest that a discussion about the objectives of using participation marks may be beneficial. For example, the use of participation marks to penalize well-achieving but misbehaving students might be questionable based on the criteria of *Principles for Fair Assessment* (1993). However, these assessment principles may also have to be followed in the context of public education, which also promotes pro-social behaviours and employability skills, such as effort and active participation (CMEC, 1999).

The home socialization category showed discrepant perceptions between teachers and students about parental involvement. Overall, teachers felt very strongly that parent involvement in their children's academic achievement decreased over time (94% of teachers), whereas nearly two thirds of the students responded that their parents' involvement had remained fairly constant. It is interesting that teachers felt so strongly about parental involvement, when students do not even appear to agree. It could be that rather than reduce their involvement, parents adapt the way they interact with their children as they get older. Thus, parents may be less involved with teachers and school personnel, but still involved in their children's education within the home. The fact that ANOVA results showed no group effects is encouraging in that no one group of students, based on grade, gender or self-reported achievement level, appears particularly disadvantaged by weaker parental involvement. This may not be the case from a socioeconomic perspective, but such data were not analyzed in this study. From the perspective of this study, boys and girls appear to have similar levels of parental involvement. As well, boys and girls did not differ significantly in their responses

designed to gain insight into the levels of responsiveness and demandingness of their parents.

Despite concerns in both academic and popular literature, the results of this study do not support the concern that there is a masculine social disassociation with academic achievement. In this study, teachers and students generally agreed with each other that students who try hard and/or succeed well in school tend to be popular. None of the independent variables showed statistically significant effects, including gender. This suggests that the students and teachers in this study do not perceive a lack in popularity associated with high achievement for male students.

These results, reflecting items in the role and societal expectations category, as well as the results from the home socialization category, are somewhat perplexing in that there were no significant indications of differential parental practices or social norms which either implicitly or explicitly encourage lower achievement for boys. Given the inconclusive effect of external factors, internal characteristics such as motivation and self-efficacy are an important next step in this area of research. However, external factors, as perceived by students, and which are beyond the immediate reach of parents and educators should also be considered, such as power hierarchies in society. If boys and girls perceive, for example, that boys can earn an adequate wage with a basic set of skills, whereas girls need higher education in order to reach the same earning potential, then the role of motivation and economic realities cannot be ignored. These concepts will be discussed in greater detail later.

Contributions of the Present Research

The purpose of this study was to explore potential sources of influence on boys' and girls' academic achievement. These sources of influence were represented by items constructed based on the five explanatory categories outlined by Gambell and Hunter (1999) in relation to gender differences in literacy: evaluative bias, home socialization, role and societal expectations, gender psychology and equity policy. Corollary goals were to discover whether the explanatory categories were related to one another, and to explore any potential discrepancies and/or similarities between teachers' and students' perceptions. Because the student and teacher instruments were constructed at the outset of this study, the nature of the study remained exploratory, especially with regards to comparing teacher and student perceptions.

Despite the limitations of the present study, which are discussed in Chapter 1, certain findings do offer some insight into the perplexing issue of differential achievement between boys and girls. For example, although the five explanatory categories used as the basis of this study are likely strongly related to academic achievement, they do not appear, based on the instruments used here, to provide a framework for explaining gender differences. There were some differences between genders on specific items that were fairly pronounced, and these were present in all five explanatory categories. However, these differences did not attain statistical significance.

Interestingly, achievement level proved to be a statistically significant mediator of student responses, based on MANOVA results. More specifically, achievement level showed a main effect for evaluative bias, gender psychology and equity policy. In other words, there were no main or interaction effects for any of the categories based on grade

or gender, and the categories of home socialization and role and societal expectations produced no main or interaction effects for grade, gender, or achievement level. In addition, many of the statistically significant main effects involved the low achievement group, which was only represented by 13 students. Thus, it is difficult to assume that the response pattern of these 13 students represents that of low achievers in general. Nonetheless, the mediating effect of achievement level is certainly worth exploring in the future.

Although no statistically significant gender differences are present in any of the categories as a whole, this study provides insight into how future research might develop. For example, it could be that quantitative analysis would be more informative once the factors underlying differential achievement are identified. Qualitative approaches might provide rich data pools that can provide thematic cues for future researchers.

Alternately, it could be that the categories used in this study do not fully address the sphere of influences in male and female students' lives, or that the instruments would benefit from methodological improvements designed to improve their discriminant validity. For example, this research instrument could be used in the future if a panel of experts in fields such as education and sociology conducted a Q-sort in order to refine the operational definitions within each of the five categories, and to strengthen the construct validity of the items. Further, a pilot study prior to a subsequent research project could provide further insight into troublesome wording or overlapping constructs. Such methodological adjustments would serve to strengthen both the reliability and the validity of this instrument, so that it can continue to be used in the future, such as for replication studies.

Further, although the present study explored the influence of role and societal expectations, the power structures and role expectations in society at large were not directly explored. For example, males' current occupational opportunities still appear stronger than women's, in terms of both income, and employability (CMEC, 1999). In this study, teachers strongly agreed that men occupied most positions of power in their schools. Thus, the impact on students of these power structures within their own schools is of interest as it reflects, to some degree, the situation outside of school. Therefore, whether female and male students are aware of the current economic picture is of interest, as is the impact of this awareness on each gender. This type of exploration would move this study into the realm of Bronfenbrenner's macrosystems (Thomas, 2000), where issues beyond the students' immediate circles of influence are thought to exercise indirect influence on them.

Despite the lack of conclusive evidence that the model examined here explains differential academic achievement based on gender, the findings of this study provide the impetus for future researchers. Thus, additional studies related to differential achievement between boys and girls can be both circumscribed and expanded by both the research instrument and the present findings.

Recommendations for Future Research

Based on the results of this study, it is difficult to ascertain which explanatory category, or combination of the categories, contribute to the differential achievement patterns between male and female students in one city in western Canada. However, both the findings of this study and related research studies may provide some guidance in establishing a framework for researching this perplexing situation.

For example, one issue to further investigate is the impact of the current demographic trend among educators in relation to students' academic achievement. In Saskatchewan, 66% of teacher-members of the Saskatchewan Teachers' Federation (STF) are female (Government of Saskatchewan, 2000b, p.78). Whether this situation favours girls, even if inadvertently, remains unknown. It should also be noted that "more males than females are principals, trustees, directors of education, or tenure-track faculty at the University of Saskatchewan, College of Education" (Government of Saskatchewan, 2000b, p. 78). In fact, this situation was reflected in the present study, when teachers indicated that most positions of authority in their school were occupied by men. Investigating the potential impact of such an uneven gender split among school personnel is of interest, as it may indicate a source of concern for students, or alternately, a little noticed fact which does not affect academic achievement. However, studying the impact of this power distribution within the school on teachers would also be beneficial, as teachers' reactions to their work environment may consciously or unconsciously be filtering down into their classrooms.

Another critical area of study that likely relates to the question of differential achievement between boys and girls involves motivational regulation and its effect on academic performance. For example, Wolters (1999) found that "students' use of motivation regulation strategies could be used to predict their use of learning strategies, effort, and classroom performance" (p. 281). Wolters (1999) studied five motivational regulation strategies, described as Self-Consequating, Environmental Control, Performance Self-Talk, Mastery Self-Talk, and Interest Enhancement. Although he did not report his results according to specific genders, he did find that "only one of the

motivational regulation strategies (i.e., Performance Self-Talk) was related to students' classroom performance as indicated by teacher-reported grades. On the other hand, the motivational strategies, as a group, explained a significant portion of the variance in students' semester grades" (p. 293). These findings seem essential in any study of academic achievement, as educators would likely agree that motivation plays a large role in performance. Consequently, future researchers may wish to investigate boys' and girls' use of motivational regulation strategies, in order to discover whether their choice of strategies, and the consistency with which they apply them, has any bearing on the issue of their differential academic achievement.

Another significant area of study may be that of students' extracurricular interests and engagements. Gambell and Hunter (1999), in their study of gender differences in literacy in grades 5, 8 and 11, delineate boys' and girls' extracurricular habits and preferences. They summarize their findings as follows:

...Females in this study spent fewer hours than males watching television, that sports programs were more than twice as popular among males than females, and that television movies were more popular among females. Male participants spent more time playing team sports, whereas females devoted more time to writing out of school, and more readily consulted references when they wrote. Proportionally more females than males read for enjoyment out of school; males were more apt to read for information or to learn how to do something. Female students had marginally higher educational aspirations than did their male counterparts (p. 4).

Gambell and Hunter (1999) argue that given female strengths in many areas of literacy and their associated extracurricular habits, the reasons underlying the significant gender

differences in literacy “need to be pursued beyond the English classroom” (p. 5). Given findings based on the present study’s instruments that there were no glaring gender differences in any of the five explanatory categories, perhaps expanding future instruments to include students’ extracurricular habits and preferences could shed light on the question of differential achievement.

In addition to the work that has been done in the field of education specifically on gender differences in achievement, there is a wealth of literature on other aspects of academic achievement and school success. For example, Quirk, Keith and Quirk (2001) studied the effect of employment on high school achievement. They found that:

Employment had an overall negative and curvilinear effect on GPA. Students who worked fewer than 12 hr per week fared better academically than those students who were not employed. A significant decline in academic performance was observed when students worked more than 11-13 hr per week (p. 4).

Interestingly, they also noted that “results from [their] study were consistent with previous longitudinal work by Greenberger and Steinberg (1986), Singh (1998), and Steinberg et al. (1993) who reported that low achievement appears to be both a cause and a result of employment” (p.9). Although Quirk et al.’s (2001) study controlled for gender, and thus did not report gender differences, comparing the employment rates and number of weekly work hours of male and female students may provide insight into the question of academic achievement. Statistics Canada (1999) does not separately report employment rates of high school students, but it is interesting to note that in Canada, 65.3% of men aged 15 to 24 are employed, compared to 73.3% in the United Kingdom and 70.8% in Australia (“Participation rates and unemployment rates by age and sex,

selected countries” page). Interestingly, these two regions have generated a substantial portion of the research on differential academic achievement. (In Canada, Australia and the United Kingdom, girls’ employment rates were lower than boys’ by approximately 4 to 8 percentage points.) Although no generalizations about high school students can be made on the employment rates of persons aged 15 to 24, these statistics might provide the starting point for future investigations about the effect of high school employment on achievement.

Even beyond high school, employment and employability may constitute a larger part of the debate on gender differences in achievement than typically acknowledged. For example, the Council of Education Ministers, Canada (CMEC, 1999) clearly states that higher levels of education are generally associated with higher rates of employment as well as higher incomes than lower educational attainment (p. 109). However, there are troublesome gender differences in employment rates, differences that contradict the findings in grade schools. For example, “in 1998, among those aged 25 to 54 with less than high school education, 50% of women were employed, compared with more than 70% of men, constituting a gender gap of 20 percentage points” (CMEC, 1999, p. 113). These gender differences decrease with increasing education levels (CMEC, 1999), and there is no indication about whether women’s lower rate of employment is voluntary.

In studying the employment rates of persons between 25 and 29 compared to those aged 25 to 54, CMEC (1999) also states that “there were no significant gender differences in unemployment rates for either age group [in 1990 and 1998]. It should be noted that employment and unemployment rates provide only a partial view of labour market conditions. Other measures that are not examined here, such as the full-time

employment rate and earnings, do reveal a gender gap” (p. 113). Interestingly, CMEC does not indicate which gender is at a disadvantage, but further in its report, states that “while female university graduates earned less than males in most fields, the gender gap in earnings between men and women narrowed over the period [between 1990 and 1998]” (p. 123).

The above statements are troublesome when considered with findings on differential academic achievement in schools on a number of points. First, the factors underlying lower employment rates for women compared to men without a high school diploma remain unclear. Second, there is the perplexity of equal unemployment rates despite women’s higher achievement in high school, higher post-secondary attendance, and higher educational attainment. Finally, women, even in 1998, earned less than their male counterparts in almost all fields of employment. These indicators suggest that despite the known link between educational attainment, income and employability, males still enjoy higher employment and income than most women, despite the fact that the former have a lower rate of high school completion and educational attainment.

This raises a difficult question for educators and social policy makers. Are resources to be spent towards equity for a group identified as producing lower overall academic achievement and lower rates of high school completion, but with higher employment and earnings, or on a group achieving better and reaching higher levels of education, but earning less in the job market? The question centers in part on how one defines inequity, and then on where it is perceived to be occurring – in the schools, in the job market or in both. CMEC (1999) suggests that “*well-educated* citizens are ...better equipped to contribute to society and participate more effectively in the democratic

process” (italics added, p.93) – it does not focus simply on *well-employed* citizens. Thus, educators must openly discuss how they will address difficulties in education which have distant consequences, such as each graduate’s level of preparation for democratic participation, and those that have more tangible consequences, such as graduates’ employability.

In other words, there are many other potential and real sources of influence on students’ academic performance besides those directly explored in the present study. These include both concrete factors such as employment during high school and extracurricular activities, and wider theoretical constructs such as students’ motivational regulation strategies or zones of proximal development. The intention here is not to argue the applicability of any particular model or theory, but only to illustrate the variety of perspectives still to be explored in the quest to understand boys’ and girls’ differential academic performance. Most importantly, it is apparent that the picture of the gender differences in achievement must be accurately understood before effective interventions can be proposed (Gorard & Rees, 1999).

Reflections

Because of the exploratory nature of this study, there are many elements in its structure that, in retrospect, require adjusting. For example, the fact that the teacher and student instruments were not in parallel form made direct comparisons impossible, as it was very difficult to construct parallel items using different formats, and because statistically derived comparisons were not advisable. However, although quantitative instruments may be relatively easily analysed, teachers’ comments on their questionnaires suggested that they felt trapped by the forced-judgement style of the

questions. This leads to the conclusion that perhaps it would be important at this stage to consider qualitative research with teachers. This would potentially lead to a better understanding of teachers' perceptions of the current situation in education. Although the teacher-participants in this study appeared very reluctant, based on their high number of non-responses, to identify one gender or another as different in a number of respects, the fact that there is indeed a gender difference in academic achievement appears almost irrefutable. Thus, teachers' perceptions of the root of this situation would likely prove very valuable. In fact, perhaps a qualitative approach with students as well would provide useful insights in the development of themes for further research.

Regarding the quantitative approach used in this study, however, the present researcher would, in retrospect, seriously consider conducting a pilot study or field test, in order to identify the areas of weakness in the two instruments, as well as the comparability of the items. For example, it was only after data collection in the present study that the researcher realized that some teacher items had no direct student equivalent. Further, a Q-sort would also be reconsidered, in order to augment the content validity, and thus reliability, of the teacher and student items.

As for the content of the items, the present researcher recommends keeping the working model of the five explanatory categories, although others might well be added. Although the results of this study do not support the rejection of the null hypothesis, especially regarding gender differences, it could be that the instrument items do not fully represent the sphere of influence of the five explanatory categories. For example, in the evaluative bias section, a fairly significant number of items related to students' understanding of textbooks and exam questions, in addition to the items addressing

assessment and teaching strategies. Perhaps a greater proportion of items relating to teachers' communication of exam objectives, use of assessment tools, and variety of teaching strategies could be considered. Such information might shed light on whether boys and girls respond and/or achieve differently based on the assessment tool (i.e., journal entry, reflection, multiple choice or laboratory skills), and the teaching strategy (i.e., group discussion, cooperative learning, group work, or individual responses).

In other words, the researcher would consider adjusting the emphasis of various concepts within each of the explanatory categories, such that their potential influence on boys' and girls' achievement in high school can be more fully explored. Perhaps informal interviews with research experts and educators in the field could be considered as a source of information for the elements that may enhance the current instruments.

In summary, the present preliminary exploration of the power of the five explanatory categories suggested by Gambell and Hunter (1999) did not provide any statistically significant evidence of clear gender differences in response patterns. However, the present researcher would, having learned from this first study, make certain adjustments in the hope of identifying areas that educators, policy makers and perhaps the students themselves, could begin to address.

REFERENCES

Abu-Hilal, M.M. (2000). A structural model of attitudes towards school subjects, academic aspiration and achievement. Educational Psychology, 20 (1), p. 75-84.

Arsenault, D. (2001). Behavioral, social, and cognitive predictors of adolescent academic self-concept: A longitudinal investigation. Paper presented at the annual meeting of the Society for Research in Child Development. Retrieved on June 25, 2002 from: www.edrs.com, ED454264.

Aunola, K., Stattin, H., & Nurmi, J-E. (2000). Adolescents' achievement strategies, school adjustment, and externalizing and internalizing problem behaviors. Journal of Youth and Adolescence, 29 (3), 289-306.

Auster, C.J. & Ohm, S.C. (2000). Masculinity and femininity in contemporary American society: A reevaluation using the Bem Sex-Role Inventory. Sex Roles, 43 (7/8), 499-528.

B.C. schools favour girls, study suggests. (1999, May 20). The Calgary Herald, p. 1. Retrieved July 31, 2000 from <http://www.calgaryherald.com/education/stories/990520/2622590.html>

Bell, J.F. (2001). Investigating gender differences in the science performance of 16-year old pupils in the UK. International Journal of Science Education, 23 (5), 469-486.

Blair, I.V. & Banaji, M.R. (1996). Automatic and controlled process in stereotype priming. Journal of Personality and Social Psychology, 70 (6), 1142-1163.

Blair, H. & Sanford, K. (1999). Single-sex classrooms: A place for transformation of policy and practice. Paper presented at the Annual Meeting of the American

Educational Research Association. Retrieved June 25, 2002 from <http://www.edrs.com>, ED 433285.

Bouchard, P. & St-Amant (J-C). (2000). Gender identities and school success. The Alberta Journal of Educational Research 46(3), 281-283.

Collins, W.A., Maccoby, E.E., Steinberg, L., Hetherington, E.M. & Bornstein, M.H. (2000). Contemporary research on parenting: The case for nature *and* nurture. American Psychologist, 55 (2), 218-232.

Council of Education Ministers, Canada. (1999). Education Indicators in Canada 1999. Retrieved May 11, 2002 from <http://www.cmec.ca/stats/pceip/1999PDF/en.chapter4.pdf> - <http://www.cmec.ca/stats/pceip/1999PDF/en.chapter5.pdf> and <http://www.cmec.ca/stats/pceip/1999/Indicatorsite/english/pages/page2e.html>

Darling, N. (1999). Parenting styles and its correlates. ERIC Digest (March 1999). Retrieved on June 25, 2002 from <http://www.edrs.com>, EDO-PS-99-3.

Datnow, A., Hubbard, L & Conchas, G.Q. (2001). How context mediates policy: The implementation of single gender public schooling in California. Teachers College Record 103 (2), p. 184-206.

Delamont, S. (2000). Three inequalities in search of a solution? British Educational Research Journal, 26 (3), 423-426.

Dowsett Johnston, Ann. (Ed.). (2001). The Maclean's guide to universities and colleges 2001. Toronto: Rogers Media.

Educational Resources Information Center (ERIC) Clearinghouse on Urban Education. (2001). Gender differences in educational achievement within racial and

ethnic groups. ERIC Digest, no. 164. Retrieved on June 25, 2002 from <http://www.edrs.com>, ED455341.

Gambell, T.J. (2000). A reply to Dianne Hallman. Canadian Journal of Education 25 (1), 68-71.

Gambell, T.J. & Hunter, D.M. (1999). Rethinking Gender Differences in Literacy. Canadian Journal of Education 24(1), 1-16.

Giancola, S. (2000). Adolescent behavior problems: Peer pressure "is" all is is cracked up to be. Paper presented at the Annual Conference of the American Educational Research Association (New Orleans, LA, April 24-28). Retrieved on October 16, 2002 from <http://www.edrs.com>, ED448384.

Gilbert, R. & Gilbert, P. (1998). Masculinity goes to school. London: Routledge.

Golombok, S. & Fivush, R. (1994). Gender development. New York: Cambridge University Press.

Gorard, S. & Rees, G. (1999). Reappraising the apparent underachievement of boys at school. Gender & Education, 11 (4), 441-455.

Government of Alberta. (1999). Diploma exam results: By gender report (p. 1). Retrieved July 31, 2000 from http://ednet.edc.gov.ab.ca/studenteval/prov_results/by_gender.htm

Government of Alberta. (2001). 2001 Provincial Results – Performance differences of males and females on Alberta Provincial Tests. Retrieved May 19, 2002 from http://ednet.edc.gov.ab.ca/k_12/results_2001/gender_discuss.htm

Haag, P. (2000). K-12 Single-sex education: What does the research say? ERIC Digest (Sept. 2000). Retrieved on June 25, 2002 from <http://www.edrs.com>, ED444758.

Hamilton, L.S. (1998). Gender differences on high school science achievement tests: Do format and content matter? Educational Evaluation and Policy Analysis 20 (3), 179-195.

Harker, R. (2000). Achievement, gender and the single-sex /coed debate. British Journal of Sociology of Education, 21 (2), 203-219.

Homack, S. (2001). Understanding what ANOVA post hoc tests are, really. Paper presented at the Annual Meeting of the Southwest Educational Research Association (New Orleans, LA). Retrieved on October 16, 2002 from <http://www.edrs.com>, ED449222.

Human Resources Development Canada (1997). Measuring Schools' Performance (p. 1). Retrieved February 20, 2001 from <http://www.hrdc-drhc.gc.ca/stratpol/arb/publications/bulletin/vol3n1/v3n1c12e.shtml>

Keith, T., Keith, P., Quirk, K., Sperduto, J., Santillo, S. & Killings, S. (1998). Longitudinal effects of parent involvement on high school grades: Similarities and differences across gender and ethnic groups. Journal of School Psychology, 36 (3), 335-363.

Kilmartin, C.T. The masculine self. (1994). Toronto: Maxwell Macmillan.

LePore, P.C. & Warren, J.R. (1996). The advantages of single-sex Catholic secondary schooling: Selection effects, school effects or "Much ado about nothing"? National Science Foundation: Paper presented at the annual meeting of the American Educational Research Association. Retrieved on June 25, 2002 from <http://www.edrs.com>, ED402325.

Maccoby, E.E. (1992). Trends in the study of socialization : Is there a Lewinian heritage? Journal of Social Issues, 48 (2). 171-185.

Mael, F. (1998). Single sex and Coeducational schooling. Review of Educational Research, 68 (2), 101-129.

Mason, E.J. & Bramble, W.J. (1997). Research in education and the behavioral sciences: Concepts and methods. Dubuque, IA: Brown & Benchmark.

McLaren, A.T. & Roman, L. (1999). What about the boys? Debate: gendered anxieties and public schools. Teacher Newsmagazine, 12 (3). Retrieved April 3, 2001 from <http://www.bctf.bc.ca/ezine/archive/199911/Support/16Whatabouttheboys.html>

Muller, Chandra. (1998). Parental involvement and adolescents' achievement. Sociology of Education 1998, 71 (October), 336-356.

Organisation for Economic Cooperation and Development (OECD). (2000). PISA 2000 Executive Summary. Retrieved June 22, 2002 from <http://www.pisa.oecd.org/knowledge/summary/f.htm>

Organisation for Economic Cooperation and Development (OECD). (2002). PISA 2000 Report. Retrieved June 22, 2002 from <http://www1.oecd.org/publications/e-book/9602011E.pdf>

Pollack, W. (1998). Real boys. New York: Owl Books.

Porter, R. (1999). Gender differences in mathematics performance. Paper presented at the Annual Meeting of the Holmes Partnership. Retrieved on June 25, 2002 from <http://www.edrs.com>, ED429818.

Principles for fair student assessment practices for education in Canada. (1993). Edmonton, AB: Joint Advisory Committee.

Quirk, K., Keith, T., & Quirk, J. (2001). Employment during high school and student achievement. Journal of Educational Research, 95 (1), p. 4-11.

SPSS Inc., SPSS Base 10.0 applications guide. SPSS Inc.: Chicago, IL.

Salisbury, J. & Jackson, D. (1996). Challenging macho values: Practical ways of working with adolescent boys. London: Falmer Press.

Saskatchewan Education. (1997). 1997 Provincial learning assessment in mathematics. Retrieved on June 28, 2002 from <http://www.sasked.gov.sk.ca/k/pecs/ae/docs/plap/math/1997.pdf>

Saskatchewan Education. (2000). Saskatchewan education indicators: Kindergarten to grade 12. Government of Saskatchewan.

Saskatchewan Education et al. (1997). Our children, our communities and our future: Equity in education – a policy framework. Saskatchewan.

Saskatchewan Teachers' Federation. (2000). Statement of policy and bylaws 2000-2001. Saskatoon: Saskatchewan Teachers' Federation.

Skelton, C. (2001). Schooling the boys: Masculinities and primary education. Buckingham: Open University Press.

Snyder, R.F. (2000). The relationship between learning styles/multiple intelligences and academic achievement of high school students. High School Journal, 83 (2), 11-21.

Sommers, C.H. (2000). The war against boys: How misguided feminism is harming our young men. Retrieved April 3, 2001 from <http://washingtonpost.com/wp-srv/style/longterm/books/chap1/waragainstboys.htm>

Statistics Canada. (2001). Canadian Statistics - Population by age group, Canada the provinces and territories. Retrieved May 5, 2001 from

<http://www.statcan.ca/english/Pgdb/People/Population/demo31b.htm>

Statistics Canada (1999). Canadian Statistics – Participation rates and unemployment rates by age and sex, selected countries. Retrieved August 30, 2002 from

<http://www.statcan.ca/english/Pgdb/People/labour/labor23b.htm>

Steele, C.M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. American Psychologist, 52 (6), 613-629.

Tapia, M. (1999). The relationships of the Emotional Intelligence Inventory. Paper presented at the Annual Meeting of the Mid-South Educational Research Association. Retrieved on June 25, 2002 from <http://www.edrs.com>, ED448207.

Thomas, R.M. (2000). Comparing theories of child development, 5th ed. Belmont, CA: Wadsworth/Thomson Learning.

University Studies Group. (1996). University of Saskatchewan institutional research, p. 5.2. Retrieved May 11, 2002 from <http://www.usg.usask.ca/statistics/pdf-1996/sect1-1996.pdf>

University Studies Group. (1997). University of Saskatchewan: Statistics volume XXIII 1997. Saskatoon: University of Saskatchewan.

University Studies Group (2000). University of Saskatchewan institutional research, p. 5.2. Retrieved May 11, 2002 from <http://www.usg.usask.ca/statistics/pdf-2000/sect1-2000.pdf>

Wolters, C. (1999). The relation between high school students' motivational regulation and their use of learning strategies, effort, and classroom performance.

Learning and Individual Differences, 11 (3), p. 281-301.

Wong, F., McCreary, D., Carpenter, K., Engle, A. & Korchynsky, R. (1999). Gender-related factors influencing perceptions of homosexuality. Journal of Homosexuality, 37 (3), 19-30.

Yackulic, A. & Noonan, B. (2001). Unpublished.

Appendix A

Post-secondary Institutions, Demographics (2001)

Universities	% Male	% Female	%Female - % Male
UBC	44	56	12
Northern BC	49	51	2
Simon Fraser	43	57	14
Victoria	44	56	12
BC Open University	41	59	18
BC Open College	34	66	32
Cariboo	42	58	16
Emily Carr	40	60	20
Fraser Valley	34	66	32
Kwantlen	41	59	18
Malaspina	40	60	20
Okanagan	42	58	16
Royal Roads	59	41	-18
Alberta	45	55	10
Calgary	45	55	10
Lethbridge	43	57	14
Alberta College of Art & Design	36	64	28
Athabasca	36	64	28
Regina	41	59	18
Saskatchewan	44	56	12
Brandon	35	65	30
Manitoba	46	54	8
Winnipeg	36	64	28
Brock	41	59	18
Carleton	43	47	-6
Guelph	37	63	26
Lakehead	48	52	4
Laurential	41	59	18
McMaster	44	56	12
Nipissing	33	67	34
Ottawa	42	58	16
Queen's	43	57	14
Ryerson	46	54	8
Toronto	44	56	12
Trent	34	66	32
Waterloo	54	46	-8
Western	44	56	12
Wilfrid Laurier	43	57	14
Windsor	46	54	8
York	38	62	24
Ontario Coll. Of Art & Design	41	59	18
Royal Military College	74	26	-48

Laval	41	59	18
McGill	42	58	16
Montreal	42	58	16
Quebec a Chicoutimi	39	61	22
Quebec a Hull	33	67	34
Quebec a Montreal	38	62	24
Quebec a Rimouski	30	70	40
Quebec a Trois-Rivieres	38	62	24
Sherbrooke	50	50	0
Moncton	37	62	24
Mount Allison	40	60	20
New Brunswick	50	50	0
St. Thomas	30	70	40
Acadia	44	56	12
Cape Breton	46	54	8
Dalhousie	43	57	14
Mount St. Vincent	14	86	72
St. Francis Xavier	44	56	12
St. Mary's	48	52	4
King's College	45	55	10
N.S. Agricultural	41	59	18
N.S. College of Art & Design	35	65	30
St. Anne	23	77	54
Memorial	41	59	18

Appendix B

Parental Consent Form – Student Instrument

Dear Parent(s)/Guardian(s),

I am a graduate student at the University of Saskatchewan who is requesting the participation of your child in a research study on the factors influencing students' academic achievement. I have randomly selected 600 students, in Grades 9 to 12 enrolled with the [REDACTED], to complete a multiple-choice survey. Your child has been one of the students randomly selected.

Participation involves completing a multiple-choice survey of 99 questions, which should take approximately 15 to 20 minutes. This survey will be conducted at your child's school during school hours.

I, parent/guardian name, CONSENT for my child, _____, to complete a survey about factors affecting his/her academic achievement. I understand that signing this consent form indicates that I understand the points listed below and that my child has permission to participate in this study.

- All information provided is confidential, as my child will not be asked to provide his/her name on the survey.
- My child will be asked to sign an assent form, which will remain separate from the survey in order to maintain confidentiality. My child will receive a copy of this assent form from the researcher.
- If my child refuses to complete the survey, or to answer any individual questions, there are no adverse consequences whatsoever, as participation in this research is entirely voluntary.
- The benefits of participating in this study are that data will help the researcher and other educators understand the influences on students' academic achievement. There are no anticipated risks to participating in this study.
- This study has been approved by the University of Saskatchewan Advisory Committee on Ethics in Behavioural Sciences Research. The Office of Research (966-4503) at the University of Saskatchewan can be contacted for any further information about my child's rights.
- In the final report (researcher's thesis), data from all surveys will be combined such that my child's responses will not appear separately.
- I can obtain a copy of a brief summary of the results after June 1, 2002 by contacting Dr. R. A. Yackulic at the University of Saskatchewan, at 966-7723 (e-mail: alan.yackulic@usask.ca)

Date: _____

Signature: _____

Thank you in advance for your time and consideration,

Andrée Nobert-Bennett

Appendix C

Student Instrument (Cover Letter)

Dear Student,

I am a graduate student at the University of Saskatchewan who is requesting your participation in a research study on the factors influencing students' academic achievement. You are one of 600 randomly selected students enrolled in Grades 9 to 12 with the _____, to participate in a survey.

Your participation involves completing a 99-item multiple choice questionnaire, which should take approximately 20 minutes to complete.

I, _____ (student name) _____, AGREE to participate in a research study about the factors influencing my academic achievement. Signing this form indicates that a) I understand the points listed below and; b) I agree to fill out the following survey.

- *All information provided is confidential, as I will not be asked to provide my name on the survey.*
- *I will receive a copy of this assent form from the researcher for my personal record.*
- *If I refuse to complete the survey, or to answer any individual questions, there are no adverse consequences whatsoever, as participation in this research is entirely voluntary.*
- *The benefits of participating in this study are that data will help the researcher and other educators understand the influences on students' academic achievement. There are no anticipated risks to participating in this study*
- *This study has been approved by the University of Saskatchewan Advisory Committee on Ethics in Behavioural Sciences Research. The Office of Research (966-4503) at the University of Saskatchewan can be contacted for any further information about my rights as a participant.*
- *In the final report (researcher's thesis), data from all surveys will be combined such that my responses will not appear separately.*
- *I can obtain a copy of a brief summary of the results after June 1, 2002 by contacting Dr. R. A. Yackulic at the University of Saskatchewan, at 966-7723 (e-mail: alan.yackulic@usask.ca)*

Date: _____

Signature: _____

Thank you for your time and cooperation,

Andrée Nobert-Bennett

Research Project: Exploring the factors influencing academic achievement

I, _____ (student name) _____, AGREE to complete the following survey about the factors affecting my academic achievement. I understand the conditions of my participation as outlined by the researcher.

Date: _____

Signature: _____

Thank you for your time and cooperation,

Andrée Nobert-Bennett

1) PLEASE KEEP FRONT PAGE FOR YOUR PERSONAL RECORDS.

2) PLEASE TEAR THIS PAGE FROM THE SURVEY AND SUBMIT TO RESEARCHER. THANK YOU!

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊕ = Disagree ⊙ = Unsure ⊕ = Agree ⊕ = Strongly Agree

⊖ ⊕ ⊙ ⊕ ⊕ 1. Classroom noises do not normally distract me much when I write an exam.

⊖ ⊕ ⊙ ⊕ ⊕ 2. On exams, my teacher(s) usually indicate how each question is weighted/evaluated.

⊖ ⊕ ⊙ ⊕ ⊕ 3. For the most part, I receive the evaluation criteria for assignments ahead of time so I know how I'll be evaluated.

⊖ ⊕ ⊙ ⊕ ⊕ 4. Generally speaking, I disagree with my teachers' comments on my report cards.

⊖ ⊕ ⊙ ⊕ ⊕ 5. I achieve better on individual written assignments than on group projects.

6. I am often surprised by the questions on exams. ⊖ ⊕ ⊙ ⊕ ⊕

7. I am often unsure of how my teachers come up with my mark or grade. ⊖ ⊕ ⊙ ⊕ ⊕

8. I am usually confused by the questions on exams. ⊖ ⊕ ⊙ ⊕ ⊕

9. I am usually given enough time to complete in-class assignments and exams. ⊖ ⊕ ⊙ ⊕ ⊕

10. I don't think there is a big difference between girls' and boys' academic achievement. ⊖ ⊕ ⊙ ⊕ ⊕

⊖ ⊕ ⊙ ⊕ ⊕ 11. I feel that my teachers often focus on my weaknesses more than my strengths.

⊖ ⊕ ⊙ ⊕ ⊕ 12. I normally do well on long answer questions.

⊖ ⊕ ⊙ ⊕ ⊕ 13. I normally know why I get a particular mark/grade on tests.

⊖ ⊕ ⊙ ⊕ ⊕ 14. I think my marks for effort generally raise my overall average.

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊖ = Disagree ⊖ = Unsure ⊖ = Agree ⊖ = Strongly Agree

⊖ ⊖ ⊖ ⊖ ⊖ 15. I usually do well on multiple choice questions.

16. I usually do well on short answer questions.

⊖ ⊖ ⊖ ⊖ ⊖

17. I usually understand the questions on a test.

⊖ ⊖ ⊖ ⊖ ⊖

18. I usually understand why I receive a particular mark/grade on assignments.

⊖ ⊖ ⊖ ⊖ ⊖

19. More of my exams at school are short and long answer rather than multiple choice.

⊖ ⊖ ⊖ ⊖ ⊖

20. When courses begin, my teachers hand out a course outline showing general objectives.

⊖ ⊖ ⊖ ⊖ ⊖

⊖ ⊖ ⊖ ⊖ ⊖ 21. In most of my core subjects, the overall average is calculated from a combination of many different marks/grades throughout the term.

⊖ ⊖ ⊖ ⊖ ⊖ 22. It is my impression that female students achieve higher than do male students in academic tasks.

⊖ ⊖ ⊖ ⊖ ⊖ 23. It is my impression that male students achieve higher than do female students in academic tasks.

⊖ ⊖ ⊖ ⊖ ⊖ 24. At my school, students are expected to attend parent-teacher conferences (interviews)

⊖ ⊖ ⊖ ⊖ ⊖ 25. My participation marks generally bring down my overall average.

26. Often, I don't understand what my teacher(s) want me to do for assignments.

⊖ ⊖ ⊖ ⊖ ⊖

27. I am independent when it comes to my education; my parents don't get involved.

⊖ ⊖ ⊖ ⊖ ⊖

28. I believe it's important to get good grades.

⊖ ⊖ ⊖ ⊖ ⊖

29. I feel my parent(s) put too much pressure on me to do well in school.

⊖ ⊖ ⊖ ⊖ ⊖

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊖ = Disagree ⊖ = Unsure ⊖ = Agree ⊕ = Strongly Agree

30. If I don't understand my homework, I usually ask my parent(s) for help. ⊖ ⊖ ⊖ ⊖ ⊕

⊖ ⊖ ⊖ ⊖ ⊕ 31. My family believes getting good grades is important.

⊖ ⊖ ⊖ ⊖ ⊕ 32. My family expects me to attend a college or university.

⊖ ⊖ ⊖ ⊖ ⊕ 33. My father attended a college or university.

⊖ ⊖ ⊖ ⊖ ⊕ 34. My mother attended a college or university.

⊖ ⊖ ⊖ ⊖ ⊕ 35. My parent(s) insist I do my best at school.

36. Passing my courses is enough to make my parent(s) happy. ⊖ ⊖ ⊖ ⊖ ⊕

37. My parent(s) generally attend parent-teacher interviews/three-way conferences. ⊖ ⊖ ⊖ ⊖ ⊕

38. My parent(s) give me freedom to decide when and how to do my homework. ⊖ ⊖ ⊖ ⊖ ⊕

39. My parent(s) often ask if I need help with my homework. ⊖ ⊖ ⊖ ⊖ ⊕

40. My parent(s) read a lot at home. ⊖ ⊖ ⊖ ⊖ ⊕

⊖ ⊖ ⊖ ⊖ ⊕ 41. My parent(s) seem interest in my academic achievement.

⊖ ⊖ ⊖ ⊖ ⊕ 42. My parent(s) trust my judgment when it comes to studying.

⊖ ⊖ ⊖ ⊖ ⊕ 43. My parent(s)' involvement has remained fairly constant since elementary school.

⊖ ⊖ ⊖ ⊖ ⊕ 44. My parent(s) involvement in my education has decreased as I've gotten older.

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊕ = Disagree ⊙ = Unsure ⊕ = Agree ⊕ = Strongly Agree

⊖ ⊕ ⊙ ⊕ ⊕ 45. Sometimes, my parent(s) help me study for my exams.

46. I don't generally speak up or answer questions in class unless I am asked. ⊖ ⊕ ⊙ ⊕ ⊕

47. Most of my closest friends go to my school. ⊖ ⊕ ⊙ ⊕ ⊕

48. I get along well with my teachers ⊖ ⊕ ⊙ ⊕ ⊕

49. I enjoy learning new things at school. ⊖ ⊕ ⊙ ⊕ ⊕

50. I enjoy learning new things outside of school. ⊖ ⊕ ⊙ ⊕ ⊕

⊖ ⊕ ⊙ ⊕ ⊕ 51. I wish I was an average student.

⊖ ⊕ ⊙ ⊕ ⊕ 52. I would describe myself as an active participant in most class discussions

⊖ ⊕ ⊙ ⊕ ⊕ 53. It's embarrassing to get one of the highest marks in the class.

⊖ ⊕ ⊙ ⊕ ⊖ 54. It's embarrassing to get one of the lowest marks in the class.

⊖ ⊕ ⊙ ⊕ ⊕ 55. My friends are fairly active participants in most class discussions.

56. My friends generally try to do well in school. ⊖ ⊕ ⊙ ⊕ ⊕

57. My friends make fun of me if I try hard in school. ⊖ ⊕ ⊙ ⊕ ⊕

58. No one in my group of friends really speaks up or answers questions in class ⊖ ⊕ ⊙ ⊕ ⊕

59. When I do poorly on a test or assignment, I don't generally tell many people. ⊖ ⊕ ⊙ ⊕ ⊕

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊕ = Disagree ⊙ = Unsure ⊕ = Agree ⊕ = Strongly Agree

60. When I do very well on a test or assignment, I don't mind if my classmates know about it. ⊖ ⊕ ⊙ ⊕ ⊕

⊖ ⊕ ⊙ ⊕ ⊕ 61. I am a patient person when it comes to getting along with my teachers and classmates.

⊖ ⊕ ⊙ ⊕ ⊕ 62. I believe my teacher(s) generally understand me, and where I am coming from.

⊖ ⊕ ⊙ ⊕ ⊕ 63. I prefer to be the leader during group work.

⊖ ⊕ ⊙ ⊕ ⊕ 64. I feel ridiculed by my teacher(s) sometimes when I don't do well on an academic task.

⊖ ⊕ ⊙ ⊕ ⊕ 65. I feel safe at school.

66. I like trying new activities and learning opportunities at school. ⊖ ⊕ ⊙ ⊕ ⊕

67. I prefer the school routine to stay constant rather than change a lot. ⊖ ⊕ ⊙ ⊕ ⊕

68. I sometimes get into trouble with my teachers for my disruptive behaviour. ⊖ ⊕ ⊙ ⊕ ⊕

69. I strive to get one of the highest marks in the class on exams. ⊖ ⊕ ⊙ ⊕ ⊕

70. I strive to get one of the highest marks in the class on assignments. ⊖ ⊕ ⊙ ⊕ ⊕

⊖ ⊕ ⊙ ⊕ ⊕ 71. I think my teachers see me more as a discipline problem than a learner.

⊖ ⊕ ⊙ ⊕ ⊕ 72. I try hard to get along with everyone in my class.

⊖ ⊕ ⊙ ⊕ ⊕ 73. If someone is feeling excluded, I try to include them in the activity.

⊖ ⊕ ⊙ ⊕ ⊖ 74. I prefer classroom activities where I can be a bit daring.

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊕ = Disagree ⊙ = Unsure ⊕ = Agree ⊕ = Strongly Agree

⊖ ⊕ ⊙ ⊕ ⊕ 75. Often, I try to find creative and/or original ways of completing assignments.

76. There should be no grades in school everyone should just pass or fail. ⊖ ⊕ ⊙ ⊕ ⊕

77. When I disagree with something at school, I make a point of telling my teacher(s). ⊖ ⊕ ⊙ ⊕ ⊕

78. When I get angry at school, I usually keep my anger to myself. ⊖ ⊕ ⊙ ⊕ ⊕

79. When I have a problem, I feel equally comfortable talking to a male or female teacher/counsellor. ⊖ ⊕ ⊙ ⊕ ⊕

80. When I have a problem, I'd rather talk to a female teacher or counsellor than a male. ⊖ ⊕ ⊙ ⊕ ⊕

⊖ ⊕ ⊙ ⊕ ⊕ 81. Both female and male students have an equal chance at succeeding academically at school.

⊖ ⊕ ⊙ ⊕ ⊕ 82. I am satisfied with the amount of group work I do in a typical school day.

⊖ ⊕ ⊙ ⊕ ⊕ 83. I am satisfied with the amount of individual seatwork I do on a typical school day.

⊖ ⊕ ⊙ ⊕ ⊕ 84. I believe my school is committed to providing equal learning opportunities to all students.

⊖ ⊕ ⊙ ⊕ ⊕ 85. I believe my teachers try hard to teach in a way that all students can understand.

86. I get enough physical activity during a typical school day. ⊖ ⊕ ⊙ ⊕ ⊕

87. I learn a lot about academic concepts by writing in a journal. ⊖ ⊕ ⊙ ⊕ ⊕

88. I learn a lot about myself by writing in a journal. ⊖ ⊕ ⊙ ⊕ ⊕

89. I understand the textbooks used in most of my courses. ⊖ ⊕ ⊙ ⊕ ⊕

Student Survey

How much do you agree with each of the following statements? Fill in the circle which indicates your level of agreement. Use the following codes:

⊖ = Strongly Disagree ⊕ = Disagree ⊙ = Unsure ⊕ = Agree ⊕ = Strongly Agree

90. I think my teachers generally see the value of extracurricular art activities. ⊖ ⊕ ⊙ ⊕ ⊕

⊖ ⊕ ⊙ ⊕ ⊕ 91. I think my teachers generally see the value of extracurricular athletic activities.

⊖ ⊕ ⊙ ⊕ ⊕ 92. My favourite course is one of my core subjects.

⊖ ⊕ ⊙ ⊕ ⊕ 93. My teachers use interesting reading materials in their teaching.

⊖ ⊕ ⊙ ⊕ ⊕ 94. My school offers at least one extracurricular activity that interests me.

⊖ ⊕ ⊙ ⊕ ⊕ 95. My school offers options courses that interest me.

96. My school offers the academic courses I need for my learning level. ⊖ ⊕ ⊙ ⊕ ⊕

97. Overall, I am interested in assigned school projects. ⊖ ⊕ ⊙ ⊕ ⊕

98. The school provides better learning opportunities to female students. ⊖ ⊕ ⊙ ⊕ ⊕

99. The school provides better learning opportunities to male students. ⊖ ⊕ ⊙ ⊕ ⊕

Demographic Information

I am in Grade 9 10 11 12
 ⊖ ⊖ ⊖ ⊖

I am Male Female
 ⊕ ⊕

I would estimate that my overall average for academic subjects is < 60% 61-75% > 75%
 ⊖ ⊖ ⊖

Appendix D

Teacher Questionnaire (Cover Letter)

Dear Teacher,

I am a graduate student at the University of Saskatchewan who is requesting your participation in a research study on the factors influencing students' academic achievement. You are one of 200 randomly selected high school teachers employed by the [redacted] to participate in a survey.

Your participation involves completing a 92-item multiple choice questionnaire, which should take approximately 15-20 minutes to complete.

I, _____ (teacher name) _____, AGREE to participate in this research study. Participation involves completing a survey about the factors affecting students' academic achievement. Signing this form indicates that a) I understand the points listed below and; b) I agree to participate in this research study.

- *All information provided is confidential, as I will not be asked to provide my name on the survey.*
- *This assent form will remain separate from the survey in order to maintain confidentiality. I will receive a copy of this assent form from the researcher.*
- *If I refuse to complete the survey, or to answer any individual questions, there are no adverse consequences whatsoever, as participation in this research is entirely voluntary.*
- *The benefits of participating in this study are that data will help the researcher and other educators understand the influences on students' academic achievement. There are no anticipated risks to participating in this study.*
- *This study has been approved by the University of Saskatchewan Advisory Committee on Ethics in Behavioural Sciences Research. The Office of Research (966-4503) at the University of Saskatchewan can be contacted for any further information about my rights.*
- *In the final report (researcher's thesis), data from all surveys will be combined such that my responses will not appear separately.*
- *This survey is in no way an evaluation of teaching practices – rather, it addresses influences on students' academic achievement.*
- *I can obtain a copy of a brief summary of the results after June 1, 2002 by contacting Dr. R. A. Yackulic at the University of Saskatchewan, at 966-7723 (e-mail: alan.yackulic@usask.ca)*

Date: _____

Signature: _____

Thank you for your time and cooperation,

Andrée Nobert-Bennett

Research Project: Exploring the factors influencing academic achievement

I, _____ (teacher name) _____, AGREE to complete the following survey about the factors affecting students' academic achievement. I understand the conditions of my participation as outlined by the researcher.

Date: _____

Signature: _____

Thank you for your time and cooperation,

Andrée Nobert-Bennett

1) PLEASE KEEP FRONT PAGE FOR YOUR PERSONAL RECORDS.

2) PLEASE TEAR THIS PAGE FROM THE SURVEY AND SUBMIT TO RESEARCHER. THANK YOU!

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you currently teach.

- ☐ (A) definite "right answers"
☐ (B) many possible "right answers"

1. The exams I administer in class consist mostly of questions with:

- ☐ (A) individual written assignments
☐ (B) group projects

2. In general, students prefer:

- ☐ (A) individual written assignments
☐ (B) group projects

3. In general, students achieve better on:

- ☐ (A) higher achievers
☐ (B) lower achievers

4. Students who do better on multiple choice than on written assignments tend to be:

- ☐ (A) higher achievers
☐ (B) lower achievers

5. Students who are more distractible during exams tend to be:

6. I reserve most of my written comments to students for:

- ☐ (A) written assignments
☐ (B) report cards

7. Usually, students writing an exam in my class:

- ☐ (A) tend to finish quickly and have time at the end
☐ (B) tend to write slowly and need extra time

8. When preparing students for an upcoming exam, I prefer to:

- ☐ (A) be very specific so they know what to study
☐ (B) be more general so they will develop autonomous study habits

9. The exams I administer in class consist more of

- ☐ (A) multiple choice
☐ (B) written responses

10. The exams I administer in class usually consist more of

- ☐ (A) multiple choice
☐ (B) short answer such as true/false or matching

11. The exams I administer in class usually consist more of

- ☐ (A) short answer such as true/false or matching
☐ (B) written response

- ☐ (A) explain the evaluation criteria orally to the class
☐ (B) distribute a written copy of the evaluation form

12. When assigning homework or projects, I more often:

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you currently teach.

- | | |
|---|--|
| <p>Ⓐ be told the weight of the overall exam
Ⓑ be told the weight of each individual question</p> | <p>13. It is typical for students in my class to:</p> |
| <p>Ⓐ complain to me or their friends
Ⓑ approach me to discuss the matter</p> | <p>14. Students who don't understand their mark/grade on an assignment tend to:</p> |
| <p>Ⓐ a combination of assignment and exam marks, and participation/effort marks
Ⓑ assignment and exam marks only</p> | <p>15. I tabulate report card marks from:</p> |
| <p>Ⓐ are fairly technical (indicate specific curriculum objectives)
Ⓑ are fairly general (indicate overall course objectives)</p> | <p>16. I distribute course outlines that:</p> |
| <p>17. Parent-teacher conferences are more effective when:</p> | <p>Ⓐ the student is present
Ⓑ the student is not present</p> |
| <p>18. End of term marks are calculated from:</p> | <p>Ⓐ the average of major assignments and exams
Ⓑ the average of many various minor assignment</p> |
| <p>19. In general, parents who attend parent-teacher interviews/three-way conferences are those of:</p> | <p>Ⓐ higher achieving students
Ⓑ lower achieving students</p> |
| <p>20. During parent-teacher interviews/three-way conferences, I would say that more parents of:</p> | <p>Ⓐ younger students attend
Ⓑ older students attend</p> |
| <p>21. My students' parent(s) generally seem:</p> | <p>Ⓐ interested in their child(ren)'s academic achievement
Ⓑ aloof about their child(ren)'s academic achievement</p> |
| <p>Ⓐ attend a post-secondary institution
Ⓑ pass high school</p> | <p>22. In general, my students' parents expect them to:</p> |
| <p>Ⓐ supported
Ⓑ criticized</p> | <p>23. When I contact parents about their child(ren)'s achievement, I generally feel:</p> |

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you currently teach.

- | | |
|--|---|
| <p>Ⓐ support the school
Ⓑ second-guess the school's decisions</p> | <p>24. In general, parents:</p> |
| <p>Ⓐ criticized and undermined by parents
Ⓑ supported and encouraged by parents</p> | <p>25. Overall, I feel:</p> |
| <p>Ⓐ decreases
Ⓑ increases</p> | <p>26. Once students reach high school, parents' involvement in their child(ren)'s education:</p> |
| <p>27. Parents' involvement in their children's education appears to:</p> | <p>Ⓐ remain constant over time
Ⓑ change as their children get older</p> |
| <p>28. Students more often ridicule:</p> | <p>Ⓐ peers who try hard in school
Ⓑ peers who put little effort into schoolwork</p> |
| <p>29. Male students appear to:</p> | <p>Ⓐ support each other to try hard in school
Ⓑ mock each other when their peer(s) try hard in school</p> |
| <p>30. Female students appear _____ when they receive one of the highest marks in the class:</p> | <p>Ⓐ proud
Ⓑ embarrassed</p> |
| <p>31. On the whole, female and male students remain on task:</p> | <p>Ⓐ to the same degree
Ⓑ to differing degrees</p> |
| <p>Ⓐ fairly equal
Ⓑ different</p> | <p>32. Female and male students' participation in classroom discussions is:</p> |
| <p>Ⓐ the same way
Ⓑ differently</p> | <p>33. Male and female students appear to perceive academic success:</p> |
| <p>Ⓐ proud
Ⓑ embarrassed</p> | <p>34. Male students appear _____ when they get one of the highest marks in the class:</p> |
| <p>Ⓐ fairly popular
Ⓑ fairly unpopular</p> | <p>35. High achieving students tend to be:</p> |

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you *currently* teach.

- Ⓐ support each other to try hard in school
- Ⓑ mock each other when their peer(s) try hard in school

37. When around me, my students:

38. In general, students:

39. My students would probably say that:

40. When it comes to personal problems, female and male students:

41. When it comes to trying new activities, female and male students:

- Ⓐ strict teachers
- Ⓑ laissez-faire teachers

- Ⓐ girls more than boys
- Ⓑ boys more than girls

- Ⓐ verbal aggression
- Ⓑ physical aggression

- Ⓐ more than half the time
- Ⓑ less than half the time

- Ⓐ more than half the time
- Ⓑ less than half the time

47. Journal writing tends to strengthen:

48. Students in my class do group projects:

36. Female students appear to:

- Ⓐ act according to their desire
- Ⓑ act according to the guidelines I established

- Ⓐ can relate to their teachers
- Ⓑ feel teachers are out of touch

- Ⓐ I am strict
- Ⓑ I am easy going

- Ⓐ come to me equally often
- Ⓑ come to me to different degrees

- Ⓐ are equally willing to try
- Ⓑ are different in their willingness to try

42. Overall, I think students prefer:

43. When behaviour difficulties arise, they involve:

44. Among students, there are more incidents of:

45. Students in my class do hands-on work:

46. Students in my class do individual seatwork:

- Ⓐ girls' learning more than boys'
- Ⓑ boys' learning more than girls'

- Ⓐ more than half the time
- Ⓑ less than half the time

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you currently teach.

G = Girls/Female students

B = Boys/Male students

49. Students tend to:

- ☐ (A) enjoy group activities
☐ (B) shy away from group activities

50. The physical education classes at my school are:

- ☐ (A) mixed boys and girls
☐ (B) separate for boys and girls

51. Students tend to prefer:

- ☐ (A) individual work
☐ (B) group work

- ☐ (A) noticeably benefit students' achievement
☐ (B) do not noticeably benefit students' achievement

52. Extracurricular art or athletic activities:

- ☐ (A) through the school
☐ (B) outside the school

53. It is more important that students have access to extracurricular athletic activities:

- ☐ (A) a wide variety of optional courses
☐ (B) a limited number of optional courses

54. The school offers:

- ☐ (A) need help understand the readings in their textbook
☐ (B) understand the readings in their textbook unassisted

55. My students appear to:

- ☐ (A) women
☐ (B) men

56. More of the positions of authority at my school are occupied by:

G = Girls/Female students

B = Boys/Male students

☐ (G) ☐ (B) 57. The highest overall achievers are usually

☐ (G) ☐ (B) 58. The lowest overall achievers are usually

☐ (G) ☐ (B) 59. On written assignments, the students who tend to do better are

☐ (G) ☐ (B) 61. On classroom exams, the students who tend to do better are

☐ (G) ☐ (B) 62. Students who prefer group projects rather than individual written assignments tend to be

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you currently teach.

G = Girls/Female students

B = Boys/Male students

63. Students who achieve better on group projects rather than individual written assignments tend to be

(G)

(B)

64. Students who do better on written assignments than on multiple choice tasks tend to be

(G)

(B)

65. The parents I contact about their children's achievement are more often

(G)

(B)

66. I would say that the students who feel pressure from their parents to achieve well in school are more often

(G)

(B)

67. The students who feel it's important to get good grades are more often

(G)

(B)

(G)

(B)

68. Students whose parents appear to be more involved in the former's schoolwork are

(G)

(B)

69. Students who appear to have more independence with regard to their schoolwork are

(G)

(B)

70. Being embarrassed to receive one of the lowest marks in the class is more typical of

(G)

(B)

71. Students who don't often speak up in class unless asked tend to be

(G)

(B)

72. For the most part, these students are more active in most class discussions

73. Being on task during class is more typical of

(G)

(B)

74. Students who are prone to speak out of turn are more often

(G)

(B)

75. Students who display creativity and/or originality in class are more often

(G)

(B)

76. I witness physical or verbal aggression from students towards their classmates more often from

(G)

(B)

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you *currently* teach.

G = Girls/Female students

B = Boys/Male students

77. When doing group work, the group leaders that emerge are often

(G)

(B)

(G)

(B)

78. Students who are most willing to try new activities are more often

(G)

(B)

79. Students who prefer a constant school routine tend to be

(G)

(B)

80. Students who are prone to ridicule others are more often

(G)

(B)

81. Students who appear open to interacting with all their classmates are more often

(G)

(B)

82. Getting high grades appears more motivating for

83. I find that the students who come to me for personal help tend to be

(G)

(B)

84. When it comes to classroom dynamics, the class leader(s) are more often

(G)

(B)

85. In my classes, the students who are most competitive for the highest mark tend to be

(G)

(B)

86. Students who prefer group work tend more often to be

(G)

(B)

87. The school's equity policy is designed to address inequities for

(G)

(B)

(G)

(B)

88. Students who prefer individual work tend more often to be

(G)

(B)

89. There are more school-sponsored extracurricular activities that interest

(G)

(B)

90. The optional courses offered by the school appeal more to

(G)

(B)

91. At the school level, more student leaders are

(G)

(B)

92. During parent-teacher interviews/three-way conferences, I would say more parents of _____ attend

Teacher Survey

Please choose the most suitable answer to these questions as they relate to the classes and subject area(s) that you *currently* teach.

G = Girls/Female students

B = Boys/Male students

Demographic Information

	Male	Female	
I am	<input type="radio"/> M	<input type="radio"/> F	
	0 - 3 years	4 - 10 years	> 10 years
I have taught for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix E

Exploring Academic Achievement Student Instrument Instruction Sheet

Test Administrators:

- a) ***Please verify that each participant has returned a signed parental consent form.***
These consent forms will be kept by the researcher until all the data has been collected, after which point they will be destroyed;
- b) ***Distribute assent forms*** (stapled set of two pages with University of Saskatchewan logo on first page) ***with one student instrument (survey) to each participant.***

Read the following to students:

1. All participants' identities are concealed from the researcher and from teachers, as all signed forms (parental consent form and student assent form) are kept separate from the completed instrument. This is a confidential study.
2. Before beginning the survey, each participant must read the assent form and sign both pages. The first is for your own personal records and the second page is to be handed in separately from the completed survey.
3. This is a survey exploring the factors that influence students' academic achievement. Remember: Participation is voluntary and there is no penalty if you wish to terminate your participation at any time.
4. Beginning the survey: Please use a pencil or pen to fill in the bubbles. Please avoid making slash marks through the bubbles, as this makes the survey difficult to scan. A dark mark inside the bubble is sufficient.
5. Your teacher(s) will collect the completed surveys, then return them to the researcher.
6. Please answer as truthfully as possible.
7. This survey should take approximately 15-20 minutes to complete.
8. Thank you very much for your participation!

Appendix F

Research Application – [REDACTED] Board of Education

January 13, 2002

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

ATTN: [REDACTED]

I am interested in conducting research within your school board for my thesis, which is in partial fulfillment of the requirements for my Masters in Education degree from the University of Saskatchewan, Department of Educational Psychology and Special Education. My thesis advisor is Dr. Alan Yackulic. The title of my research study is "An exploration of factors influencing boys' and girls' academic achievement".

I propose to do this research during the first two weeks of February 2002, pending your approval. There are three parts to my research project, which I have described below. The benefits of participating in this study are that data will help the researcher and other educators understand the influences on students' academic achievement. There are no anticipated risks to participating in this study

Part I:

I would like to randomly select 600 grade 9 to 12 students from your database to whose parents I will send parental consent forms through the students. This number of 600 is based on a projected return rate of 50% for the consent forms, giving approximately 300 eligible students. Once I have received the parental consent forms, I propose to visit each high school so that the students whose parents have given consent can complete the survey. I ask that a school official assemble these students in a way that suits the school's needs (i.e., in "shifts" of 30 students at a time in a classroom, or with all students completing the survey at the same time such that they are supervised by school officials). The survey should take approximately 20 minutes to complete – once the students have completed the surveys, I will collect them. Note that the assent forms signed by students will not be attached to the students' surveys such that I will not be able to associate the students' signature with his/her survey.

Part II:

I would like to randomly select 24 students from grades 9 to 12 from one school in order to conduct a semi-structured focus group. We will have a discussion based on the focus group interview guide. The parents of these students will also receive parental consent forms through the students, with the students completing assent forms at the time of the focus group discussions. Students will continue to be randomly selected until I have received consent from 12 girls' parents and 12 boys' parents.

The focus group will consist of 12 boys and 12 girls – the two gender groups will be interviewed separately in order to encourage open discussion. The discussion will last approximately 20 minutes. The students participating in the focus group will not be required to complete a survey.

Part III:

I propose to randomly select 200 high school teachers to complete a teacher survey. My intention is not to evaluate teaching practices, but to explore discrepancies and/or patterns between teacher and student perspectives such that the data obtained from the two sets of surveys might lend insight to the question of the differential achievement between male and female students.

I have received authorization from the University of Saskatchewan's Advisory Committee on Ethics in Behavioural Science Research (#2001-195) to conduct this study, provided the [REDACTED] Board of Education also agrees. Please do not hesitate to contact me at 780-459-7762 or Dr. Alan Yackulic at the University of Saskatchewan at 966-7723 if you require additional information. You may also contact the Advisory Committee on Ethics in Behavioural Science Research directly regarding the rights of the participants at 966-4053.

Thank you in advance for your consideration,

Andrée Nobert-Bennett