

**RELATIONS BETWEEN STUDENT PERCEPTIONS OF THEIR SCHOOL
ENVIRONMENT AND ACADEMIC ACHIEVEMENT**

by

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ABSTRACT

This study examined the relation between student perceptions of their school environment (specifically safety and inclusion in the school, experiences being bullied, and clear expectations for behaviour) and academic achievement. Participants were students in 969 elementary schools and 73 middle schools who took part in a province-wide achievement test and student satisfaction survey. Hierarchical multiple regression analyses were conducted to determine the amount of variance in student achievement explained by student perceptions of the school environment when controlling for family poverty. Results showed that perceptions of the school environment were significantly associated with academic success, above and beyond that of family poverty. These results are discussed with regards to previous and future research, limitations, and the importance of enhancing the school environment to maximize academic achievement.

PREFACE

This thesis consists of original research conceived by the graduate student, with advisement from her research supervisor. The data were previously collected by the British Columbia Ministry of Education, and access was granted to the graduate student through EduData. The graduate student was responsible for analysis and writing, and thus, this thesis represents her work as lead researcher and author. Ethics Approval was required by the UBC Behavioural Research Ethics Board (BREB) to conduct this research. The UBC BREB certificate number is H10-00959.

TABLE OF CONTENTS

ABSTRACT	ii
PREFACE	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES	vi
ACKNOWLEDGEMENTS.....	vii
CHAPTER 1: INTRODUCTION	1
School Environment and Academic Achievement	2
Expectations for Behaviour	3
Bullying and Victimization	4
School Safety.....	6
Welcoming and Acceptance.....	7
The Role of Family and Neighbourhood Poverty.....	8
The Present Study	10
CHAPTER 2: METHOD.....	11
Participants and Settings.....	11
Measures	11
Academic Achievement	11
Student Perceptions	12
Family Poverty	13
Design and Analyses.....	14
CHAPTER 3: RESULTS.....	15
Relations among Satisfaction Survey Variables	16
Predictors of Grade 4 Numeracy	16
Predictors of Grade 4 Reading Comprehension.....	18
Predictors of Grade 7 Numeracy	19

Predictors of Grade 7 Reading Comprehension.....	20
CHAPTER 4: DISCUSSION.....	22
Student Perceptions of Their Schools.....	22
Knowledge of Expectations	23
Victimization and Feeling Safe at School	24
Feeling Welcome at School.....	25
Differences by Subject	26
Differences by Grade Level	26
Limitations and Future Research	28
Implications for Practice	30
REFERENCES.....	32

LIST OF TABLES

Table 3.1 Descriptive Statistics for Study Variables.....	15
Table 3.2 Correlations Between Satisfaction Survey Questions	16
Table 3.3 Hierarchical Regression Analysis for Variables Predicting Grade 4 Numeracy ..	17
Table 3.4 Hierarchical Regression Analysis for Variables Predicting Grade 4 Reading Comprehension.....	19
Table 3.5 Hierarchical Regression Analysis for Variables Predicting Grade 7 Numeracy ..	20
Table 3.6 Hierarchical Regression Analysis for Variables Predicting Grade 7 Reading Comprehension.....	21

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CHAPTER 1: INTRODUCTION

A major goal of schooling is the attainment of academic skills. Traditionally, schooling has focused almost exclusively on improving students' skills in reading, writing, and math (Hymel, Schonert-Reichl, & Miller, 2006). This emphasis is not surprising, as academic achievement is important to future outcomes. Pre-schoolers' knowledge of numbers is a strong predictor of learning more advanced mathematical skills and knowledge of letters and word sounds consistently predicts reading achievement in elementary school (Duncan et al., 2007). Students' potential to succeed after secondary school is based largely in part on their academic achievement. Student grade point average (GPA) in secondary school is a strong predictor of post-secondary grades and completion, which is then predictive of job attainment and performance (Kuncel, Crede, & Thomas, 2005).

Additionally, academic achievement is related to a number of important behavioural and social outcomes for students. As early as kindergarten, the relation between problem behaviour and academic achievement is evident. Kindergarten students who enter school with reading skill deficits are more likely to engage in problem behaviour at the end of elementary school (McIntosh, Horner, Chard, Bolland, & Good, 2006). In a longitudinal study examining the relation between behaviour and academic achievement in an urban middle school, the number of office discipline referrals (ODRs) students received was predictive of their scores on standardized tests of math and reading; students receiving higher levels of ODRs had decreased achievement (Lassen, Steele, & Sailor, 2006). Conversely, prosocial behaviours are a significant predictor of high achievement (Malecki & Elliot, 2002).

When students have academic skill deficits that do not respond to classroom instruction, the experience of failure may lead to behaviours such as aggression, classroom disruption,

depression, and negative self-attribution (McIntosh, Horner, Chard, Dickey, & Braun, 2008). Students with poor academic standing are also more likely to engage in violence and substance abuse during adolescence (Fleming, Harachi, Cortes, Abbott, & Catalano, 2004) and are at greater risk of developing symptoms of depression during adolescence (Herman, Lambert, Reinke, & Ialongo, 2008). Additionally, poor academic achievement is a strong predictor of school dropout (Battin, Abbott, Hill, Catalano, & Hawkins, 2000; McIntosh, Flannery, Sugai, Braun, & Cochrane, 2008).

For students who struggle academically, there are a variety of behavioural and environmental factors that may affect their learning, such as attention problems, social skills deficits, difficulties working independently, chronic absenteeism, bullying and victimization, low socioeconomic status, poor or inconsistent parenting, and parental absence (Duncan et al., 2007; Edwards, Mumford, & Serra-Roldan, 2007; Glew, Fan, Katon, Rivara, & Kernic, 2005). School-related factors that may affect student learning include the amount of academic engaged time provided and teachers' classroom management skills (Gettinger & Ball, 2008). In light of these factors, it is essential to identify variables within the school environment that can be modified to enhance student academic achievement.

School Environment and Academic Achievement

Often, interventions in schools focus on either academic deficits or student behaviour problems, without consideration of the link between behaviour and academic achievement (McIntosh et al., 2006). A common perception is that if time was spent focusing on managing student behaviour, time would be taken away from academic instruction, and student achievement would suffer (Malecki & Elliot, 2002). Contrary to these beliefs, there is a growing body of research documenting the relation between school variables, student behaviour, and

academic achievement. Student perceptions of their school environment are important to their overall academic achievement (Samdal, Nutbeam, Wold, & Kansas, 1998). Effective educational practices expand far beyond the curriculum taught in the classroom; attention to establishing a safe, predictable environment and sound instruction in social behaviour are important predictors of student academic achievement (Horner et al., 2005).

In previous research, variables related to school environment have included student perceptions of safety and inclusion, relationships with teachers and other adults in the school, and involvement in school activities (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Samdal et al., 1998). Additional factors, such as learning in an environment free from bullying (Glew et al., 2005), and knowledge of school and teacher expectations for behaviour (Horner, Sugai, Smolkowski, Eber, & Nakasato, 2009) may affect student achievement.

Expectations for Behaviour

Whether consistently posted and taught or implicit and possibly vague, most schools have expectations for how their students should behave. Having clear expectations for students is essential to their academic learning; it has been estimated that up to 50% of classroom time is spent disciplining off-task, non-compliant or disruptive behaviours, taking time away from academic instruction (Cotton, 1991). Research has shown that establishing and reinforcing school-wide rules and expectations decreases the level of disruptive behaviours in classrooms and reduces the number of office discipline referrals (Nelson, Martella, & Galand, 1998). Establishing, teaching, and enforcing school expectations can be an effective way to address disruptive and off-task behaviour, which results in more academic engaged time for students (Algozzine & Algozzine, 2007).

Research on the importance of clear school-wide expectations for students has largely been conducted within the framework of School-wide Positive Behaviour Support (SWPBS). SWPBS is a systems approach to establishing and maintaining a positive school climate where students know the school's expectations, are acknowledged for their appropriate behaviour, and receive consistent, instructional consequences for rule violations (Horner et al., 2005). Teaching all students expectations for their behaviour in the school and posting these expectations around the school for regular reference and precorrection is one of the core components of SWPBS (Horner et al., 2005). By establishing a school culture in which students are most likely to engage in appropriate behaviour, opportunities for teaching and learning are maximized (Horner et al., 2009; Scott & Barrett, 2004). Research has shown that SWPBS has been effective for improving student academic behaviours, both in terms of reading (Horner et al., 2009) and mathematics achievement (Lassen et al., 2006). In a longitudinal study, implementation of SWPBS was significantly related to student performance on state-wide tests of reading comprehension and mathematics (Luiselli, Putnam, Handler, & Feinberg, 2005). These positive results in achievement may be the result of teachers spending less time disciplining students, students spending more time in the classroom, and increased student academic engagement (Algozzine & Algozzine, 2007; Conroy, Sutherland, Snyder, & Marsh, 2008; Horner, Sugai, Todd, & Palmer, 2005; Scott & Barrett, 2004). In addition, SWPBS may affect achievement indirectly through improved student social relations, student-teacher relationships, and feelings of safety (Conroy et al., 2008; Horner, et al., 2009).

Bullying and Victimization

Bullying and victimization occur frequently among students and can take many forms, such as physical aggression, threats, insults, spreading rumours, social exclusion, and mocking

the victim's culture, disability, or sexual orientation (Olweus, 2003). In a survey conducted by Pepler and Craig (2000), 71% of teachers said they usually intervene in bullying incidents, yet only 25% of students reported that their teachers intervened. Furthermore, in most cases, students believe that neither their teachers nor their classmates would intervene to stop bullying (Unnever & Cornell, 2003). Schools can thus unwittingly support a "culture of bullying" where students can act aggressively without fear of reprimand, bystanders do not intervene or report incidents, and adults do not actively supervise students. As a result, students may begin to internalize the beliefs that bullying in schools is a normal occurrence and some students deserve to be bullied (Rocke-Henderson, Hymel, Bonanno, & Davidson, 2002).

Children who are victimized at school suffer in terms of healthy academic, social, and emotional growth (Goldbaum, Craig, Pepler, & Connolly, 2007). When school personnel are not able to reduce the prevalence of bullying, the school culture may become an environment of fear that disrupts academic learning for all students (Whitted & Dupper, 2005). Students involved in bullying (as perpetrators, victims, or both) score lower on standardized tests of academic achievement (Glew et al., 2005) and reported poor school adjustment in terms of school work and homework completion (Nansel, Haynie, & Simonsmorton, 2003). Victims of relational bullying are three times more likely to score poorly on standardized tests than students who are not bullied (Woods & Wolke, 2004). Students who are bullied are more likely to stay home from school, report that they dislike school or drop out of school altogether (Whitted & Dupper). Bystanders are also affected; recent research with students aged 12 to 16 demonstrated that witnessing incidents of bullying led to increases of symptoms associated with depression, anxiety and other mental health disorders (Rivers, Poteat, Noret, & Ashurst, 2009), which can in turn affect student academic achievement.

School Safety

Creating safe environments where students feel protected and ready to learn is a fundamental goal for schools. According to the United States Department of Education's National Centre for Educational Statistics, in the 2007-2008 school year, 5% of students aged 12 to 18 feared they were going to be attacked or harmed at school, 7% of students reported avoiding one or more places in school for fear of their safety, 11% of students reported being in a physical fight on school property, and 35% of students aged 12 to 18 saw hate-related graffiti at school (Robers, Zhang, Truman, & Snyder, 2010). Students identifying with racial/ethnic minority groups and students in urban areas were most likely to report feeling unsafe at school. In a study conducted in a large Canadian city, 10% of elementary school students reported feeling unsafe at school (Beran & Tutty, 2002).

Feeling unsafe at school represents a significant barrier to learning. Students who feel unsafe at school are more likely to stay home from school or skip classes due to concerns about their safety and are less likely to participate in the classroom to expand their learning (Boyd, 2004; Hernandez & Seem, 2004). Student perceptions of school safety are strongly influenced by aspects of the school environment, such as school climate, discipline code fairness, and school safety actions (Kitsantas, Ware, & Martinez-Arias, 2004). Students who report a positive view of their school climate are more motivated and show higher academic achievement than students who report not being satisfied with their school climate (Samdal et al., 1998). School climate has been found to be positively related to student academic achievement and socio-emotional adjustment and negatively related to behaviour problems and substance abuse (Brand et al., 2003).

Welcoming and Acceptance

Acceptance by teachers and peers has been consistently linked to student academic achievement. The quality of student-teacher relationships, especially early in school, has been shown to contribute to long-term student achievement and behaviour outcomes (Hamre & Pianta, 2001). Teachers who rate high levels of closeness with their students also rate their students as demonstrating increased academic skill levels (Pianta & Stulman, 2004). Teachers who demonstrate caring and respect to their students provide a greater amount of emotional support to their students, which in turn increases student achievement-related self-concept and motivation to learn (Eccles et al., 1993). Moreover, students who report positive relationships with their teachers score higher on tests of math and reading (Konishi, Hymel, Zumbo, & Li, 2010).

Acceptance by peers has also been linked to student academic achievement; peer group membership and peer acceptance has been demonstrated to be related to grade point average in Grades 6 and 7 (Wentzel & Caldwell, 1997). Positive relationships with peers may provide incentives to achieve and increase self-esteem and interest in school, and positive cooperative learning groups, whether facilitated by the teacher or formed naturally, can increase student understanding of academic material (Wentzel, 1991). Inclusion and involvement in school activities may also be related to academic achievement. Cooper, Valentine, Nye, and Lindsay (1999) found that students who participated in school-based extracurricular activities had a more positive identification with school and showed higher levels of academic achievement, even after controlling for socio-economic status. Such students are also more likely to complete high school and pursue post-secondary education (Eccles et al., 1993).

The Role of Family and Neighbourhood Poverty

The relation between family and/or neighbourhood poverty levels and student academic achievement has been thoroughly explored. Most research has focused on socioeconomic status (SES); which generally refers to an individual or family's position on a social and economic hierarchy according to their income, occupation, educational attainment, and availability of social supports (Canadian Institute for Health Information, 2008). High familial SES has been linked to better physical and mental health outcomes, whereas low SES is related to childhood obesity, stress, emotional and behavioural difficulties, social skill deficits, and school dropout (LeClair, 2002; Lupien, King, Meaney, & McEwen, 2001).

School SES is generally measured by the number of students from families with income levels at or below a nationally determined poverty line or who qualify for free or reduced-price lunch programs (Sirin, 2005). In a meta-analytic review of 74 independent studies examining the relation between school SES and student academic achievement, Sirin found a medium effect size at the student level and a large effect at the school level, suggesting that family poverty has a strong impact on student academic achievement.

A common criticism of assessing student academic achievement on standardized tests and comparing performance among schools is the lack of consideration of the socio-economic context (Haladyna, Haas, & Allison, 1998; Herron, 2007). There is a belief that large-scale standardized assessments are a better indicator of neighbourhood income level than student performance (British Columbia Teachers' Federation, 2011), as students from more affluent neighbourhoods generally have higher achievement scores than students from schools in less affluent areas (Muijs, 1997). Research supporting this belief demonstrates that school location largely determines the amount of resources available to the school, and as a result, higher neighbourhood

income is related to greater school expenditures per student (Sirin, 2005). Schools in low SES neighbourhoods may have a difficult time attracting high quality teachers and have teachers who experience greater levels of stress, experience more staff turnover, and are more likely to work with families and children from culturally and linguistically diverse backgrounds (Herron, 2007; Putnam, McCart, Griggs, & Choi, 2009). Families in poverty may not be able to afford materials that promote cognitive development and learning. Moreover, financial stress may negatively affect parenting behaviours, and long or inconsistent work schedules may reduce the amount of time parents can spend with their children to foster academic and social-emotional skills (Dearing, McCartney, & Taylor, 2009; LeClair, 2002). Additional research has suggested that family poverty may influence children's academic achievement indirectly through parent attitudes and expectations regarding their children's academic performance (Davis-Kean, 2005).

Although there is a documented link between family or neighbourhood poverty and achievement, other research has demonstrated that high quality interventions and stimulating home environments may moderate this relationship. Dearing and colleagues (2009) found that high quality early child care and education significantly moderated the effects of low SES, particularly in the area of mathematics achievement. Students in inner-city schools whose teachers received training in classroom management showed significantly higher scores on standardized achievement tests than students in control schools (Freiberg, Stein, & Huang, 1995). Furthermore, SWPBS interventions have been linked to increased student academic achievement in schools in low SES neighbourhoods (Putnam et al., 2009). In a study looking at parent education and beliefs about education, Davis-Kean (2005) found that when low-income parents provided an emotionally stable and stimulating home environment and promoted academic achievement, their children had improved achievement. Although poverty and associated family

conditions may greatly impact students, it is also evident that positive factors within the home and school can minimize the negative effects of poverty on achievement.

The Present Study

The goal of the present study was to explore the relation between student perceptions of their school environment and academic achievement for students in Grades 4 and 7. Previous research has linked academic achievement and social behaviour through the presence or non-presence of interventions and preventative systems (Horner et al., 2009), the use of office discipline referral data (McIntosh, Flannery, Sugai, Braun, & Cochrane, 2008) or teacher and school staff ratings (Fleming et al., 2004; Horner et al., 2009). Few research studies have explored the role of student ratings of school environment and academic achievement, and even fewer have also controlled for neighbourhood poverty. The present study will add to the literature by examining student perceptions of a number of aspects of the school environment to assess the extent to which aspects are most related to academic achievement and identify what specific aspects of the school environment can be targeted to enhance academic achievement most effectively. The following research questions were addressed for students in Grades 4 and 7:

1. Are student perceptions of different aspects of their school environment (i.e., safety, acceptance, victimization, and knowledge of expectations) related?
2. When controlling for family poverty and school district, is there a relation between student perceptions of their school environment and academic achievement?

CHAPTER 2: METHOD

Participants and Settings

Participants included students in 969 elementary schools and 73 middle schools from all 60 public school districts in British Columbia during the 2008-2009 academic year. The participating elementary and middle schools represented 93% of the public elementary and middle schools in the province. To be included in the study, schools had to have reported results and participation rates for the provincially mandated achievement measure and accompanying student satisfaction survey. In addition, Census data regarding the percent of families with Low Income after Tax Cut-Offs (LICO-AT) at the school level must have been available. Census data were not available for schools without neighbourhood catchments (e.g., French immersion schools, alternate programs, and virtual schools), and as a result, these schools were not included. The average enrolment per school was 242 students (range = 5 – 1,076). The average number of schools per district was 27 (range = 5 – 127).

Measures

Academic Achievement

Student academic achievement was measured by the Foundation Skills Assessment (FSA), a high stakes provincial achievement measure developed by the BC Ministry of Education and administered to all BC students in Grades 4 and 7 each year. The stated purposes of the FSA are to assess the effectiveness of educational programs and measure individual and aggregate student progress for comparison to provincial performance standards (BC Ministry of Education, 2007a). The FSA includes three scales: numeracy, reading comprehension, and writing. The measure is administered in both pencil and paper and computer format and includes multiple

choice and written response items. The BC Ministry of Education categorizes student performance on these scales into three outcome levels: Not Yet Meeting Expectations, Meeting Expectations, and Exceeding Expectations. The criteria for these levels are based on provincial performance standards.

The FSA has been reviewed by technical test reviewers, including teachers, curriculum specialists, and assessment specialists, to evaluate the following characteristics: grade-level appropriateness, accuracy, bias, and sensitivity (BC Ministry of Education, 2008). Reliability coefficients have been calculated for each scale in each grade using Cronbach's alpha (α). For numeracy, the reliability coefficient was .90 for Grade 4 and .90 for Grade 7 and for reading comprehension, the reliability coefficient was .88 for Grade 4 and .89 for Grade 7 (BC Ministry of Education, 2008). Validity of the FSA has been assessed by evaluating item alignment, item bias, sensitivity, use of multiple test items, and use of standardized administration procedures, though no quantitative validity data are publicly available (BC Ministry of Education, 2008).

For the purposes of this study, student performance on the numeracy and reading comprehension scales was used to measure academic achievement. The percent of students either Meeting or Exceeding Expectations at each school was used in analyses. The average participation rate per school was 85% (SD = 15) at Grade 4 and 85% (SD = 16) at Grade 7.

Student Perceptions

Student perceptions of their school environment were measured by the provincial Satisfaction Survey. The Satisfaction Survey was developed by the BC Ministry of Education to measure student, parent, and school staff satisfaction in a number of areas, including achievement, school environment, social development, and safety. Students in Grades 4 and 7 in BC schools complete the Satisfaction Survey in conjunction with the FSA. The survey takes

approximately 10 minutes to complete and consists of 32 questions with Likert-type responses, including At No Time, Few Times, Sometimes, Many Times, and All of the Time.

The questions on the Satisfaction Survey were developed with input from teachers and experts in educational measurement, special education, and instruction (Ministry of Education, 2007b). Although technical adequacy information on the Satisfaction Survey was not publicly available, the Ministry of Education states that their analyses have shown the questionnaire to be both reliable and valid (BC Ministry of Education, 2007c).

The items assessing perceptions of the school environment were used for the purpose of this study, including:

1. Do you know how your school expects students to behave?
2. At school, are you bullied, teased, or picked on?
3. Do you feel safe at school?
4. Do you feel welcome at your school?

The percent of students responding Many Times or All of the Time at each school was used in analyses. The average student Satisfaction Survey participation rate was 90% (SD = 13) at Grade 4 and 89% (SD = 13) at Grade 7.

Family Poverty

Poverty status was indicated by the most recent Census of Canada data (2006) regarding the percent of families with Low Income after Tax Cut-Offs (LICO-AT) in each school catchment area. Although Canada does not recognize an official poverty level, as a guideline, a family that is spending 70% or more of their after-tax income on basic necessities such as food, clothing, and shelter is considered to meet LICO-AT (Statistics Canada, 2006). The LICO-AT is partially based on size of family and area of residence, such that a large family living in an urban

area will have a higher cut-off level than a small family living in a rural area. The average percent of families with LICO-AT at the school level was 6% (SD = 4) at Grades 4 and 7.

Design and Analyses

SPSS (version 19.0) was used to analyze the data. To assess how student perceptions of their school environment were related, a correlation matrix was created to examine the correlations among the Satisfaction Survey variables. To assess the prediction of student performance on the numeracy and reading comprehension scales of the FSA from their responses to the questions on the Satisfaction Survey, hierarchical multiple regression was conducted, controlling for the effects of district and percent of families meeting LICO-AT. Separate analyses were completed for numeracy and reading comprehension scales for each grade level.

In the regression equations, district was added first as a categorical variable and percent of families with LICO-AT was added as the second block. The percent of students responding Many Times or All of the Time to each of the four Satisfaction Survey questions was added in the third block to determine the extent to which the Satisfaction Survey variables explained variance in academic achievement above and beyond district and family poverty. At each block, the additional proportion of variance accounted for by each variable was examined. Statistical significance was determined through an F -test of R^2 change, and the magnitude of the effect was determined through calculation of the total model R^2 and the effect size index, f^2 , for each variable. According to Cohen (1992), an f^2 of 0.02 indicates a small effect, an f^2 of 0.15 indicates a medium effect, and an f^2 of 0.35 indicates a large effect. The relation between individual Satisfaction Survey variables and academic achievement was determined by the regression coefficient (β) for each variable.

CHAPTER 3: RESULTS

Descriptive statistics for the percent of students in each school meeting or exceeding expectations on the numeracy and reading comprehension scales, responding Many Times or All of the Time on the Satisfaction Survey items, and the percent of families meeting the LICO-AT are presented in Table 3.1.

Table 3.1 Descriptive Statistics for Study Variables

Group	Mean %	SD
<i><u>Achievement Scores (FSA)¹</u></i>		
Gr. 4 Numeracy	74.76	18.28
Gr. 4 Reading Comprehension	79.54	14.92
Gr. 7 Numeracy	72.00	20.03
Gr. 7 Reading Comprehension	76.57	15.88
<i><u>Satisfaction Survey Items²</u></i>		
Gr. 4 ‘Do you know how your school expects students to behave?’	88.07	9.73
Gr. 4 ‘At school, are you bullied, teased or picked on?’	11.90	9.67
Gr. 4 ‘Do you feel safe at school?’	82.94	10.92
Gr. 4 ‘Do you feel welcome at your school?’	82.53	9.73
Gr. 7 ‘Do you know how your school expects students to behave?’	84.71	10.94
Gr. 7 ‘At school, are you bullied, teased or picked on?’	9.89	7.90
Gr. 7 ‘Do you feel safe at school?’	77.80	13.94
Gr. 7 ‘Do you feel welcome at your school?’	73.78	14.00
<i><u>Low-Income Cut-Off³</u></i>		
Gr. 4	5.68	4.05
Gr. 7	5.90	4.18

Note. ¹ Numbers represent the percent of students Meeting or Exceeding Expectations

² Numbers represent the percent of students responding Many Times or All of the Time

³ Numbers represent the percent of families meeting the LICO-AT at the school level

Relations among Satisfaction Survey Variables

To test the hypothesis that student responses to the Satisfaction Survey questions would be related, correlations were conducted. The results of the correlational analyses are presented in Tables 3.2. For both Grades 4 and 7, all correlations among the four Satisfaction Survey variables were in the anticipated directions and statistically significant, $p < .01$.

Table 3.2 Correlations Between Satisfaction Survey Questions

	Expectations	Victimized	Safe	Welcome
<u>Grade 4</u>				
Expectations	--			
Victimized	-.19**	--		
Safe	.27**	-.31**	--	
Welcome	.26**	-.31**	.58**	--
<u>Grade 7</u>				
Expectations	--			
Victimized	-.28**	--		
Safe	.56**	-.45**	--	
Welcome	.53**	-.37**	.72**	--

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Predictors of Grade 4 Numeracy

A multiple regression analysis was conducted to predict Grade 4 student achievement on the numeracy scale of the FSA from district, family poverty, and student perceptions of school environment (Table 3.3). Results showed that district accounted for a statistically significant amount of the numeracy achievement variability, $R^2 = .05$, $F(1, 966) = 45.41$, $p < .001$. Adding percent of families meeting LICO-AT to the model accounted for a significantly increased proportion of the numeracy achievement variance, R^2 change = .03, $F(1, 965) = 25.82$, $p < .001$. After controlling for the effects of district and family poverty, the Satisfaction Survey variables

accounted for a significant proportion of the numeracy achievement variance, R^2 change = .10, $F(4, 961) = 28.52, p < .001$. The effect size attributable to the addition of the Satisfaction Survey variables, when controlling for district and family poverty, was small to medium, $f^2 = 0.11$.

Of the Satisfaction Survey variables, knowing the school expectations for behaviour ($\beta = .12, p < .001$) and feeling safe at school ($\beta = .16, p < .001$) were statistically significant positive predictors of Grade 4 numeracy achievement. Victimization at school ($\beta = -.19, p < .001$) was a statistically significant negative predictor of Grade 4 numeracy achievement. Feeling welcome at school was not a statistically significant predictor.

Table 3.3 Hierarchical Regression Analysis for Variables Predicting Grade 4 Numeracy

	Model 1			Model 2			Model 3		
Variable	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
District	-.21	.03	-.21***	-.22	.03	-.23***	-.19	.03	-.19***
Poverty				-.72	.14	-.16***	-.48	.14	-.11***
Expectations							.23	.06	.12***
Victimized							-.39	.06	-.19***
Safe							.26	.06	.16***
Welcome							-.08	.06	-.05
R^2		.05			.07			.17	
<i>F</i> for change in R^2		45.41***			25.82***			28.52***	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Predictors of Grade 4 Reading Comprehension

The results of the Grade 4 reading comprehension analysis (Table 3.4) indicated that district accounted for a statistically significant amount of variability, $R^2 = .02$, $F(1, 966) = 23.77$, $p < .001$. Adding percent of families meeting LICO-AT accounted for a statistically significant increase in proportion of reading comprehension variance, R^2 change = .03, $F(1, 965) = 25.44$, $p < .001$. After controlling for the effects of district and family poverty, the Satisfaction Survey variables accounted for a statistically significant increase in the proportion of variance, R^2 change = .07, $F(4, 961) = 18.35$, $p < .001$. The effect size attributable to the addition of the Satisfaction Survey variables was small to medium, $f^2 = 0.07$.

Of the Satisfaction Survey variables, knowing the school expectations for behaviour ($\beta = .10$, $p < .001$), victimization at school ($\beta = -.15$, $p < .001$), and feeling safe at school ($\beta = .14$, $p < .001$) were statistically significant predictors of Grade 4 reading comprehension. Feeling welcome at school was not a statistically significant predictor.

Table 3.4 Hierarchical Regression Analysis for Variables Predicting Grade 4 Reading Comprehension

	Model 1			Model 2			Model 3		
Variable	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
District	-.12	.03	-.16***	-.14	.03	-.17***	-.11	.02	-.14***
Poverty				-.59	.12	-.16***	-.44	.12	-.12***
Expectations							.15	.05	.10***
Victimized							-.24	.05	-.15***
Safe							.19	.05	.14***
Welcome							-.04	.05	-.03
R^2		.02			.05			.11	
<i>F</i> for change in R^2		23.77***			25.44***			18.35***	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Predictors of Grade 7 Numeracy

The results of the Grade 7 numeracy analysis (Table 3.5) showed that district accounted for a significant amount of the numeracy variability, $R^2 = .07$, $F(1, 768) = 57.59$, $p < .001$. Adding percent of families meeting LICO-AT to the model did not account for a statistically significant proportion of the numeracy variance, R^2 change = .001, $F(1, 767) = 0.47$, $p = .49$. After controlling for the effects of district and family poverty, the Satisfaction Survey variables accounted for a statistically significant increase in the proportion of the numeracy variance, R^2 change = .10, $F(4, 763) = 22.91$, $p < .001$. The effect size attributable to adding the Satisfaction Survey variables was small to medium, $f^2 = 0.12$.

Of the Satisfaction Survey variables, knowing the school expectations for behaviour ($\beta = .19$, $p < .001$), victimization at school ($\beta = -.10$, $p < .01$), and feeling safe at school ($\beta = .15$, $p < .001$),

.01) were statistically significant predictors of Grade 7 numeracy achievement. Feeling welcome at school was not a statistically significant predictor.

Table 3.5 Hierarchical Regression Analysis for Variables Predicting Grade 7 Numeracy

	Model 1			Model 2			Model 3		
Variable	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
District	-.29	.04	-.27***	-.29	.04	-.27***	-.25	.04	-.23***
Poverty				.12	.17	.02	-.17	.16	.04
Expectations							.35	.08	.19***
Victimized							-.27	.10	-.10**
Safe							.21	.08	.15**
Welcome							-.09	.07	-.06
R^2		.07			.07			.17	
<i>F</i> for change in R^2		57.59***			0.47			22.91***	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Predictors of Grade 7 Reading Comprehension

The results of the Grade 7 reading comprehension analysis (Table 3.6) showed that district accounted for a significant amount of the reading comprehension variability, $R^2 = .04$, $F(1, 768) = 31.95$, $p < .001$. Adding percent of families meeting LICO-AT also accounted for a statistically significant proportion of the reading comprehension variance, R^2 change = .01, $F(1, 767) = 5.50$, $p < .05$. After controlling for the effects of district and family poverty, the Satisfaction Survey variables accounted for a statistically significant increase in proportion of the reading comprehension variance, R^2 change = .07, $F(4, 763) = 14.84$, $p < .001$. The effect size attributable to the addition of the Satisfaction Survey variables was small to medium, $f^2 = 0.07$.

Of the Satisfaction Survey variables, knowing the school expectations for behaviour ($\beta = .17, p < .001$) was a statistically significant predictor of Grade 7 numeracy achievement.

Victimization at school, feeling safe at school, and feeling welcome at school were not statistically significant predictors.

Table 3.6 Hierarchical Regression Analysis for Variables Predicting Grade 7 Reading Comprehension

	Model 1			Model 2			Model 3		
Variable	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
District	-.17	.03	-.20***	-.18	.03	-.21***	-.15	.03	-.18***
Poverty				-.31	.13	-.08*	-.29	.13	-.08*
Expectations							.25	.06	.17***
Victimized							-.003	.08	-.001
Safe							.10	.06	.08
Welcome							.06	.06	.05
R^2		.04			.04			.11	
<i>F</i> for change in R^2		31.95***			5.50*			14.84***	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

CHAPTER 4: DISCUSSION

The goal of the present study was to examine the relation between student perceptions of their school environment and academic achievement in numeracy and literacy, while controlling for the effects of district and neighbourhood poverty level. A multiple regression design was used to determine which of these variables significantly predicted academic achievement in numeracy and literacy. Results indicated that for both Grades 4 and 7 numeracy and literacy achievement, student perceptions of their school environments explained a statistically significant amount of variance beyond that of district and neighbourhood poverty. The effect sizes associated with the unique contribution of the Satisfaction Survey variables were small to medium in all analyses, suggesting that student perceptions of their school environments play a significant, indirect role in their academic success.

These findings add to the current literature in that they show the importance of the school environment as a target for enhancing academic achievement. There is a commonly held belief that family characteristics, such as income level, account for a significant percent of student ability and achievement in school, and today's school personnel have less influence over academic achievement than these family characteristics. In truth, school-related variables have been found to be significant in influencing student achievement (Ungerleider, 2006), and in this study, student perceptions of their school environment explained more variance in academic achievement than neighbourhood poverty level.

Student Perceptions of Their Schools

In the current study, student perceptions of the school environment were significantly related to achievement in numeracy and literacy for students in Grades 4 and 7. For students in Grade 4, victimization was the strongest predictor of numeracy and literacy achievement,

whereas for students in Grade 7, knowledge of expectations was the strongest predictor of numeracy and literacy achievement. Although student ratings of feeling safe and welcome at school were strongly correlated at Grades 4 and 7, feeling welcome at school was not a significant independent predictor of numeracy or literacy achievement for either grade. Feeling safe at school was the second strongest predictor in the model for Grade 4 numeracy, Grade 4 literacy, and Grade 7 numeracy.

Knowledge of Expectations

In the current study, the percent of students who reported knowing their school's expectations for behaviour was a significant predictor of numeracy and literacy achievement in Grades 4 and 7 and the only significant predictor for both grade levels and both subject areas. Previous research has demonstrated that when school expectations are explicitly taught to students, rule violations and office discipline referrals are reduced, school environments are more predictable, and teachers respond more consistently to student behaviours (Nelson et al., 1998). As a result, more instructional time can thus be focused on academic subjects, and students may be more likely to attend to instruction (Algozzine & Algozzine, 2007).

Knowledge of expectations is a key factor in promoting positive behaviour in schools. When expectations are unclear, teachers may overrely on punitive responses to disruptive behaviours (Maag, 2001; Nelson et al., 1998). Traditional approaches to discipline that include reprimands, detentions, suspensions, and placements in alternate programs do little to teach students about appropriate behaviours; they only serve to teach what behaviours are unacceptable (Horner et al., 2005). Moreover, these responses disrupt student access to academic instruction (Scott & Barrett, 2004). When expectations for behaviour are clearly defined and explicitly taught, students are given developmentally appropriate guidance for behaviour. As such, having

clear expectations for behaviour in school is a foundation for improving other aspects of the school environment. The use of school-wide expectations creates a more predictable, positive, and consistent school environment, where students feel safer and develop better quality relationships with their teachers and peers (Conroy et al., 2008; Horner et al., 2005; Horner et al., 2009). This school environment allows for more academic instruction with fewer interruptions, indirectly promoting academic success (Ialongo, Poduska, Wethamer, & Kellam, 2001; Kellam, Mayer, Rebok, & Hawkins, 1998).

Victimization and Feeling Safe at School

Victimization at school and feeling safe at school were both significant predictors of Grade 4 numeracy, Grade 4 literacy, and Grade 7 numeracy. For Grade 4 students, the experience of being bullied or victimized was the strongest predictor of numeracy and literacy in the model with feelings of safety as the next strongest predictor. It is not surprising that feeling safe at school showed a similar relationship to achievement as victimization. Research has demonstrated that students who felt unsafe at school were 2.1 times more likely to be a victim of bullying than those who felt safe, and 5 times more likely to be a bully-victim (Glew et al., 2005).

The significance of being bullied or victimized on achievement is supported by previous research. Students who do not feel safe at school suffer academically - they show decreased motivation at school and avoid actively engaging in the classroom (Boyd, 2004; Hernandez & Seem, 2004), and tend to score lower on standardized achievement tests (Glew, 2005; Nansel et al., 2003; Woods & Wolke, 2004).

Bullying negatively affects students in a variety of direct and indirect ways. Students who are bullied are more likely to stay home from school and are more likely to exhibit symptoms associated with depression, anxiety and other mental health disorders (Hymel et al., 2006; Rivers

et al., 2009; Whitted & Dupper, 2005), all of which affect their ability to attend to instruction and learn new concepts. Students who are bullied may also have fewer friends and fewer opportunities for positive social interactions, which places them at a higher risk for poor academic achievement (Swearer, Espelage, Vallaincourt, & Hymel, 2010). Additionally, students who have learning challenges or other disabilities that may affect their functioning at school are more frequently bullied than their peers, compounding their vulnerability for poor academic achievement (Cummings, Pepler, & Craig, 2006).

Feeling Welcome at School

The percent of students who reported feeling welcome at school was not a significant independent predictor in any of the four analyses. This result was somewhat surprising, considering previous research that has demonstrated that students' relationships with their peers and teachers and participation in school activities are related to academic achievement (Cooper et al., 1999; Wentzel, 1991; Wentzel & Caldwell, 1997). It may be that the concept of feeling welcome and/or accepted at school is too broad and open to different interpretations, and other concepts that would fit under these umbrella terms are in fact linked to student academic achievement. Wentzel suggested that friendships, group acceptance, and group membership may all have distinct roles in promoting academic achievement. In this study, the percent of students who reported feeling welcome at school was strongly related to the other student perceptions, suggesting that it is important to students. However, these other constructs were more strongly related to achievement.

Differences by Subject

For both Grades 4 and 7, results were nearly identical across numeracy and literacy, though perceptions of school environment were slightly more related to numeracy than literacy. This finding has been supported in previous research. When teachers rated their students' social skills, their ratings were more strongly correlated with students' standardized math scores than reading scores, although the correlations were significant for both analyses (Malecki & Elliot, 2002). Lassen and colleagues (2006) found that the implementation of SWPBS was related to increases in mathematics scores, but not reading scores, on standardized tests. In contrast, Twemlow and colleagues (2001) found that after a violence prevention intervention was implemented in two elementary schools, students' scores on standardized tests of reading improved significantly, whereas their scores on standardized math tests did not.

A possible explanation for the differences found in this study is the variation in instruction across subjects. In British Columbia, there is a provincially mandated text for math, but not for reading, where teachers have more freedom to select instructional materials. As a result, reading instruction across schools may be more variable than math instruction. Because of this variability, student academic performance may have been more influenced by the quality of reading instruction, whereas there may have been more of a notable effect of school environment in math, in which the instruction was more uniform.

Differences by Grade Level

In this study, although student perceptions of their school environment were significantly associated with academic achievement across grade levels, the specific predictors of achievement were different for Grades 4 and 7. Student victimization showed a stronger relation with numeracy and literacy at Grade 4 than at Grade 7. Age differences in the prevalence of

victimization may explain some of the varying results obtained. In this study, more Grade 4 students reported being bullied or victimized than Grade 7 students. Perpetrators of bullying generally have a physical and social advantage over their victims (Craig & Pepler, 2007), and thus Grade 4 students may be more likely targets of bullying than Grade 7 students. Other research has found that primary students report they were most often targeted by older students, whereas very few intermediate students report being bullied by younger students (Beran & Tutty, 2002). Moreover, younger students may engage in bullying more frequently as a way to gain acceptance with their peers, but as students age, they bully less frequently (Unnever & Cornell, 2003).

Student knowledge of school expectations showed a stronger relationship with numeracy and literacy at Grade 7 than at Grade 4, and it was the only student perception variable that was a significant predictor of Grade 7 literacy achievement. Research has suggested that teachers of elementary and middle school students have similar expectations for their students (Lane, Pierson, Stang, & Carter, 2010; Lane, Wehby, & Cooley, 2006). However, teachers of younger students may be more likely to teach expectations explicitly, provide frequent reminders, and acknowledge positive behaviours than teachers of older students (Bohanon et al., 2006). As a result, although teachers at Grades 4 and 7 may have similar expectations for their students, there may be more variability in how expectations are taught and reinforced at Grade 7, leading to different school environments and differences in achievement. These results imply that the use of effective practices to teach expectations at Grade 7 may be important to enhancing achievement.

Lastly, the influence of poverty on academic achievement was greater at Grade 4 than at Grade 7. Previous research findings are mixed regarding the impact of poverty on education as students age. Some researchers suggest that influence of family income on student academic

achievement declines with age (Davis-Kean, 2005; Duncan & Brooks-Gunn, 1997). Poverty may be more closely related to student developmental outcomes in early childhood, but have less influence on student outcomes in middle childhood and adolescence (Davis-Kean). In contrast, other research suggests that family poverty is a significant risk factor for adolescents, in that secondary students living in poverty are at a greater risk for not graduating and are less likely to obtain post-secondary education (Duncan & Brooks-Gunn, 1997). Sirin (2005) suggested that the magnitude of the relation between SES and academic achievement increases significantly with each grade level until secondary school, where the magnitude of the relationship begins to decrease.

Limitations and Future Research

There are a number of limitations that should be considered when interpreting the results of this study. A limitation of using extant FSA data is that the reliability of the scores is unknown. Although training items are provided so that scorers can practice, using the training items and comparing scores for inter-rater reliability is not mandatory. However, the numeracy and reading comprehension assessment contain relatively few items where scorer judgment is required (e.g., open ended responses).

The manner in which students respond to the Satisfaction Survey questions may also be prone to error. The Ministry of Education does not provide students with operational definitions to refer to while completing the survey; student perceptions of feeling safe, welcome, or bullied is left to their interpretation. As previous research has suggested, there are a variety of personal and environmental factors that influence how students perceive and react to bullying and threats to safety (Goldbaum et al., 2007), and as a result, students may respond differently to seemingly similar incidents.

This study attempted to examine if there were differences in the relation between the four Satisfaction Survey variables and student academic achievement. Though analyses showed differing levels of strength in these relationships, caution must be used in interpreting results due to the use of single item responses, as opposed to a scale. For future research, the use of a more comprehensive survey with multiple questions regarding similar constructs would be ideal.

Although this study included all Grade 7 responses to obtain a representative picture of the relationship between student perceptions and academic achievement, there may have been key differences between Grade 7 student perceptions based on their enrolment in elementary school or middle school. Any possible differences between elementary and middle school Grade 7 student ratings of their school environment were not explored or accounted for and would be an area for future research.

Another key limitation is the utility of the 2006 Census data. Although Census data regarding poverty has remained relatively consistent, it is a limitation that the Census data were collected two years prior to the collection of the academic achievement and student perception data. Additionally, the use of the Census data assumes that all students are attending the school in their neighbourhood catchment area, and for a variety of reasons, this assumption is not always accurate. In British Columbia, families can apply to have their children attend a different school if a valid reason is provided. Therefore, it cannot be assumed that the family income levels for each school catchment area are completely representative of the families who have children attending those schools. Additionally, the use of a low income cut-off measure does not entirely capture SES, and there may be other familial factors that place students at risk for poor academic achievement. Moreover, because neighbourhood poverty levels were used, individual variability in family poverty was not assessed. Although neighbourhood poverty affects school resources

and parent involvement, the individual effects of poverty may be more influential on achievement than neighbourhood effects.

Implications for Practice

As the student population becomes more diverse and student needs become more complex, teachers are increasingly challenged to find ways to maximize student learning. The results of this study indicate that how students perceive their school environment is significantly related to their academic success. Previous research has suggested that approximately 30% of the variance in student learning is attributable to school factors, and there are a variety of ways in which schools can alter the environment to provide optimal learning conditions (Ungerleider, 2006). A focus on improving student behaviour and making the school climate more safe and positive can have substantial positive effects on student achievement.

This study indicates that interventions focused on teaching expectations, reducing bullying, and increasing safety could be most effective in enhancing academic outcomes. Furthermore, the results of this study suggest that different interventions may be more effective for different grades. At Grade 4, a focus on safe schools and bullying prevention may be most effective in improving student behaviour and academic outcomes. In higher grades, teaching expectations for behaviour may be most effective. Interventions such as SWPBS that aim to teach expectations for behaviour, monitor and encourage positive behaviours, and prevent problem behaviours, provide a solid foundation for both behaviour support and academic achievement.

In 2001, the BC Ministry of Education provided a focus on teaching students positive behaviours by adding Social Responsibility as one of the key areas of learning. The framework for Social Responsibility comprises a wide range of behaviours, including contributing to the classroom and school community, solving problems in peaceful ways, valuing diversity and

defending human rights, and exercising democratic rights and responsibilities (BC Ministry of Education, 2001). Ultimately, the goals of encouraging socially responsible students are to help students cope with social situations, such as bullying and disruptive behaviour, in an acceptable manner, to create a more positive school climate.

With the addition of Social Responsibility to the performance standards, educators are increasingly applying evidence-based practices to support student behaviour. There are an array of evidence-based practices and interventions aimed at preventing bullying, increasing school safety, teaching school-wide expectations, and increasing positive student behaviours. Although this study does not evaluate specific practices, it does provide evidence supporting the use of effective practices to affect student behaviour and achievement. Educators can improve school climate, student behaviour, and academic achievement by teaching students positive, acceptable behaviours, much in the same way that academic skills are taught. The results of this study support the teaching of socially responsible behaviour in the classroom, as an avenue not only to increase positive behaviours, but also to improve student achievement.

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