WHO IS ACCOUNTABLE FOR HIGH SCHOOL DROPOUT? A STUDY OF THE PERSONAL, PARENTAL, AND TEACHER RELATED FACTORS OF ELEMENTARY STUDENTS AS PREDICTORS OF HIGH SCHOOL DROPOUT

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Abstract

This study examined the extent to which personal, parental, teacher, and school related factors can predict high school dropout among elementary students using data collected from the National Longitudinal Survey of Children and Youth (NLSCY) in Canada. An initial set of predictor variables was gathered from a teacher questionnaire about each student, and the dependent variable, high school dropout, was measured in the follow-up cycles included in the NLSCY. The focus of the current study was to determine which factor(s), captured at the elementary school level, predict high school dropout. The findings from this study indicate that gender, socioeconomic status, hyperactive and inattentive behaviours, as well as parental support, all predicted high school dropout.

Introduction

Currently, roughly 10% of Ontario high school students do not complete the requirements for a high school diploma (Mang, 2008; Statistics Canada, 2005). Although this statistic might not seem alarming in its numerical form, the repercussions of this statement are startling. In a report released by the Ministry of Education in 2004, a Student Success policy was created to help reduce the provincial dropout rate. This policy added 1,300 additional teachers into the Ontario secondary school system from 2005 to 2008 in an effort to produce "more high school graduates, greater school stability, and increased quality for all programs" (Ontario Ministry of Education, 2004b, p.1). The policy has been cleverly coined by the media as the "no fail policy", and its success is still to be determined. The policy is being criticized by media sources for passing students when they have not completed the academic requirements in an effort to ensure a higher graduation rate (Zwaagstra, 2010).

Regardless of whether the policy is a success or not, efforts to lower the dropout rate are continuous due to the personal, financial, and social repercussions that exist as a result of someone not completing high school. This continuous focus indicates that a need for better prevention efforts is constantly in demand and of crucial political and social importance. Hankivsky (2008) states that even a small increase (for example 1%) in high school graduation rates across Canada would result in cost savings of approximately $7.7 billion dollars for Canadians. This example illustrates that the costs that are accrued by society from individuals dropping out of high school can be considerable and that

significant costs to our society could be reduced by increasing Canada's high school graduation rate by as little as 1%.

Individuals who do not complete the requirements for a high school diploma are at a higher risk for a host of negative outcomes. According to research, these outcomes include: reduced lifetime earnings, poor health, increased unemployment, delinquency, crime, substance abuse, early childbearing, economic dependency, reduced quality of life, and an increased incidence of marital instability (Dryfoos, 1990; Organisation for Economic Co-operation and Development (OECD), 2006). The majority of these negative consequences that are related to not completing high school stem, in part, from the difficulty these individuals have in finding and sustaining gainful and meaningful employment. According to Statistics Canada, the unemployment rate among people aged 25 to 44 who did not have a high school diploma in 2004 was 12.2%, while the unemployment rate for individuals with a high school diploma was 6.8% (Bowlby, 2008).

Students who leave high school without receiving a diploma are not necessarily destined to be unemployed or somehow live a less than fulfilling life. Individuals who drop out of high school may go on to find an unconventional career passion that they were unable to explore or nurture in the educational organization, and become quite successful both professionally and personally. However, this alternative success story may be the exception to the norm and not the typical developmental path of a high school dropout. Early identification and intervention efforts aimed at reducing the high school dropout rate may help ensure each student's maximum academic potential is achieved and determine where future efforts need to be directed, whether it be with the student, the teacher, or the parents, and at what age these efforts need to start. Attempting to identify

and isolate which combination of variables at the personal, familial (i.e., parental), and school (i.e., teacher) level are predictive of high school dropout could offer key insight into the specific intervention and prevention models that would be best utilized to lower the dropout rate in Ontario.

National Longitudinal Survey of Children and Youth

All data for the study were obtained from the National Longitudinal Survey of Children and Youth (NLSCY), which was initiated in 1994–1995 and is a joint project of Human Resources Development Canada (HRDC) and Statistics Canada (Statistics Canada, 1998). The NLSCY is a long-term study that follows the development and well-being of Canadian children from birth to early adulthood (Statistics Canada, 2010). The target population in the NLSCY is comprised of the noninstitutionalized civilian population (aged 0 to 11 at the time of their selection) across Canada (Statistics Canada, 2010). The NLSCY has gone through eight cycles, with data collected every 2 years since 1994. The NLSCY excludes children living on Indian reserves or Crown lands, residents of institutions, full-time members of the Canadian Armed Forces, and residents of some remote regions. Depending on the cycle, there are between 20,000 and 30,000 children in the NLSCY database. The NLSCY collects information about factors that impact a child's social, emotional, and behavioural development, from parents, guardians, teachers and some self-report measures from youth through phone interviews and questionnaires.

The goal of the current study is to examine the personal, parental, teacher, and school related factors that exist in a group of 8-10-year-old students using data from the National Longitudinal Survey of Children and Youth in Canada (NLSCY). This study seeks to identify which variables, if any, included in the above-mentioned areas of

examination, are associated with an increase in the likelihood of an individual dropping out of high school. The results of this research will provide insight into the factors most important for dropout intervention and prevention efforts, in order to ensure that each student has the best chance of successfully completing high school.

Theoretical Framework

The following investigation seeks to go beyond any one influence of high school dropout and instead discuss the factors from an ecological point of view that contribute to a student leaving high school before graduating. The reality is that high school dropout is the result of many factors interacting together and against the student early on, to produce either a successful or unsuccessful student developmental pathway; the latter may ultimately result in a student leaving high school before earning a diploma.

Urie Bronfenbrenner (1979) is the pioneer developmental psychologist who is credited with the ecological explanation of human development. Bronfenbrenner developed the ecological systems theory to explain how biological predispositions and environmental influences affect a person's development from birth. Bronfenbrenner's model is made up of five levels of analysis: the microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

The microsystem is made up of the immediate environment the child lives in. This system includes any immediate relationships or organizations the child interacts with (i.e., school, immediate family, religious groups, peers). The child's interaction with these variables, whether healthy or unhealthy, determines his/her path of development. Each child's specific biologically developed personality traits, or predispositions, also affect how other people in the microsystem treat them, thus forming the child's identity.

Bronfenbrenner's (1979) next level, the mesosystem, explains how the various elements of a child's microsystem work together; their interactions (interaction between home and school, school and work) are what make up the mesosystem. The third level in ecological systems theory is the exosystem level. This level includes the events that occur within the immediate setting that influence the child but do not directly include the child in their occurrence (i.e., parent's job satisfaction, financial difficulties, parent–teacher interactions). Bronfenbrenner's fourth level is the macrosystem. This is the largest and most remote system and includes people and places that exist in a child's environment that influence his/her development (i.e., cultural values, the economy, lifestyles). The last system included in Bronfenbrenner's theory is the chronosystem; this system is made up of environmental events and transitions that occur over the child's life course but also includes sociohistorical circumstances that influence the child's development (e.g., the women's movement, change in family structures, and advance of technology).

Unique to Brofenbrenner's (1979) theory is the idea that the child's development is molded through multiple people, places and environmental interactions, and that each system (i.e., micro, meso, exo, macro, and chrono) contributes and interacts with each other to influence the child's development.

Literature Review

Attempting to explain why students drop out of high school is an inherently complex endeavour. Many scholars, all of whom will be discussed in further detail in this chapter, have isolated specific variables associated with high school dropout such as low socioeconomic status and income, gender, race, high levels of aggression and inattention, poor social skills, and a lack of family and school support. Unfortunately, little ground has been gained in reducing the dropout rate since 2000 (King, 2005). The various explanations provided for why a student leaves high school before finishing can be understood through examining the biological influences, social influences, and psychological influences.

A systematic search of the literature was conducted to identify prior studies on the causes of high school dropout. Descriptors such as "dropout," "dropping out," "school withdrawal," "academic failure," "grade retention," "grade failure," "flunked," "failed," "retained," "noncompletion" and other suggested synonyms were used to search reference databases. Through searches conducted in several journal databases such as ERIC, PsycInfo, PsychArticles, Scholars Portal, ProQuest and EBSCOhost, 200 articles were found on this topic from 1970 to 2010. The criteria for inclusion in this research report required that the article be a professional publication and that the results of the article must reflect an association between high school non-completion and student, parent and/or teacher related predictors.

The proceeding sections will discuss the previous research conducted on student factors which includes background characteristics (i.e., gender, socioeconomic status and family income, and race) and student's personal characteristics (i.e., emotions,

behaviours, social skills, academic achievement and classroom work habits), along with parental factors (i.e., parental support and involvement) and teacher and school related factors (i.e., teacher's expectations of students, teacher efficacy as it pertains to student success and their ability to manage difficult behaviours and student learning issues, along with teaching experience and class size) that have been previously documented and discussed as contributing to high school dropout in the context of Brofenbrenner's (1979) ecological theory of child development.

Student Factors

The first section in the ecological theory of development, the microsystem, revolves around the person, in this case the child, and represents his or her biological predispositions, personalities, behaviours, and the environment in which he or she is raised and through which his or her development is fostered. Every child is unique in his or her biological and psychological dispositions; even identical twins have varying personality traits and social dispositions. The one thing that remains common for every child is that their biological, psychological, and social characteristics influence their development from birth to adulthood. The discussion of student factors begins with a review of background and sociocultural characteristics, such as gender, race, income, and socioeconomic status, and continues into an examination of students' emotions, behaviours, and dispositions, and then finishes with a discussion on students' school performance.

Background characteristics (Socioeconomic status, income, race, and gender).

For some time now researchers and educators have noticed several similarities and differences between the educational experiences of males and females. Most notably, research has documented gender differences in math and reading achievement (Richmond & Miles, 2004). These two areas of education continue to be a primary focus of the Ontario Ministry of Education as the Ministry continues to develop new policies aimed at improving student academic achievement. The Ministry has recently introduced a new policy to support the needs of male students who underachieve in certain subject areas such as reading and math when compared to females (Richmond & Miles, 2004). According to the Ontario Ministry of Education (2004a), an increasing amount of research is suggesting that gender is a significant factor influencing standardized test scores, special education programs, and high school dropout. As such, some schools have even begun to examine the benefits and drawbacks of gender segregated classrooms (Sangster & Crawford, 1986).

Vitaro, Brendgen, Larose, and Tremblay (2005) studied the interactive effects of child characteristics on later high school dropout measured at age 20 in a sample of Canadian children. The researchers used logistic regression to assess the effects of sex and sociofamily adversity in childhood on later high school dropout rates. The results from their investigation showed that sex and sociofamily adversity had a significant effect on high school dropout. In particular, girls and children from less sociofamilial adverse homes were more likely to graduate by age 20 than were boys or children from high sociofamilial adverse homes (Vitaro et al., 2005).

In addition, Ensminger and Slusarcick (1992) examined several factors in a sample of grade 1 students in Chicago that could potentially be associated with high school dropout including academic achievement on standardized tests. The results from their research revealed that females in grade 1 had higher odds of graduating than males in grade 1. Students who had higher levels of academic achievement (As and Bs) in grade 1 were more likely to graduate from high school when compared to students who had lower levels of academic achievement (Cs and Ds) in grade 1.

Newcomb et al. (2002) also gathered data from a longitudinal study conducted by the Seattle Social Development Project from 1985 to 1993 involving 808 10-year-old students from 18 different Seattle elementary schools. Their data were collected directly from each participant, their parents, and their teachers annually until the participants were 18 years of age. The sample consisted of 412 males and 396 females, and a substantial number of the participants were from low-income households. The investigators gathered data on each student's socioeconomic status (SES) as reported by the parent's statement of income and whether or not the student was participating in a lunch support program at his/her school. This information was compared to whether or not he/she completed high school by age 18. The researchers used structural equation modeling to examine the associations between the predictor variables and high school dropout. Their analyses revealed that family SES was significantly related to high school status; specifically, the children with high SES were more likely to graduate high school, and that high school failure in general, was correlated with gender, but only approached significance, with boys failing more than girls (Newcomb et al., 2002).

In a similar study of socioeconomic status and gender, Jimerson, Egeland, Sroufe, and Carlson (2000) investigated the influence on high school graduation at age 19 in their longitudinal study of "at-risk" students. Results from logistic regression analyses revealed that the children's gender and socioeconomic status in sixth grade were each significantly associated with high school status at age 19.

In addition, Véronneau, Vitaro, Pedersen, and Tremblay (2008) offer another perspective on fixed child characteristics and high school dropout in their 17-year longitudinal study involving 997 Caucasian French-speaking boys from Quebec from 1983 to 2000. These researchers collected data on each participant during childhood, preadolescence, adolescence, and early adulthood. Socioeconomic status information was gathered from the participants' parents during childhood and preadolescence, and graduation rates were gathered from the participants in adolescence and early adulthood. The researchers examined correlations among early childhood predictors and high school dropout as well as using logistic regressions; they found that socioeconomic status (SES) was negatively correlated with high school dropout and also increased the overall risk for dropout, with boys dropping out more often than girls (Véronneau et al., 2008).

The research supporting the impact of SES, gender, and family income at an early age is well documented among several other longitudinal studies dating back to the early 1990s (Ensminger & Slusarcick, 1992; Janosz, Leblanc, Boulerice, & Tremblay, 1997). In addition to gender, SES and income, race was also identified as a key background characteristic that may influence a student's decision to drop out of high school.

When discussing the relevance of race in educational outcomes of students, several researchers have found differing educational outcomes among various socioeconomic, linguistic, ethnic, and racial groups. The Ontario Ministry of Education (2009) takes these proposed cultural imbalances within the education system quite seriously and has recently released a comprehensive educational policy relating to diversity among students and schools. Policy 119, Equity and Inclusive Education in Ontario Schools, attempts to enforce and promote a multicultural education that is reflected in the curriculum, teachers' interactions with students, and within school settings. Policy 119's mission is as follows "Equity and inclusive education aims to understand, identify, address, and eliminate the biases, barriers, and power dynamics that limit students' prospects for learning, growing, and fully contributing to society." (Ontario Ministry of Education, 2009, pp. 1). The mere fact that such a policy exists opens the discussion for the impact that racial and ethnic backgrounds have on students' academic success, in particular for the purposes of this discussion, its impact on high school completion.

Stearns and Glennie (2006) compare dropout reasons by grade and age throughout a student's entire high school career in their longitudinal study design. The data for their investigation come from the North Carolina Education Research Data Centre at Duke University, which houses data on students in the public school system from 1996 to 2006. Their samples consisted of a cross-section of dropouts from the school year 1998 to 1999, including those who left the 9th, 10th, 11th, and 12th grades (Stearns & Glennie, 2006). The authors used hierarchical logistic modeling to examine the different processes of dropping out, including the extent to which reasons for dropping out vary by ethnicity

and gender (Stearns & Glennie, 2006). The authors coded each participant's reason for leaving into the following categories: disciplinary, academic, family, moving, and employment reasons, and attendance problems.

The results from their study indicate that there are several different reasons why students leave high school early and that these reasons can be compounded by racial background characteristics. Their findings indicated that African American males were more likely to leave high school before graduating due to disciplinary reasons than were members of any other ethnic or gender group from 9th grade through 11th grade (Stearns & Glennie, 2006). In addition, the authors reported that Latino females were most likely to leave high school early for family reasons than any other racial group from every grade and white males dropped out of high school for academic reason more frequently than any other ethnic or gender group across all grades. In considering relocation as a possible factor in high school dropout, it was found that the Latino population was more likely than any other ethnic group to dropout due to relocation from 9th grade to 11th grade. There was no difference in the likelihood of students dropping out for employment reasons when comparing the Latino male group to the White male group. Lastly, the authors reported that when examining attendance rates, females from both African American and White groups were more likely than males from the White group to leave school for attendance related issues.

Hickman, Bartholomew, Mathwig, and Heinrich (2008) conducted a similar study where the reasons that students left high school before completion were examined across different racial backgrounds. The researchers conducted a cross-sectional survey of high school dropouts and nondropouts comparing their varying racial backgrounds. The

author's sample consisted of 1, 812 (53% male) participants, ranging in age from 13 to 21 years. Participants were composed of 37% non-Hispanic White and 63% Mexican American (Hickman et al., 2008). The author's sample included 990 nondropouts, and 822 school dropouts. According to the authors, dropouts were recruited by identifying 7th through 12th graders who had been absent from school for more than 30 days, had not transferred to another school, and who had not sought readmission. Consistent with previous studies, there were differences between Mexican American and non-Hispanic White adolescents in the reasons they cited for dropping out. The researchers found that a greater percentage of Mexican American adolescents reported leaving school before completion due to family related reasons but that a greater percentage of Non-Hispanic White participants reported a lack of school bonding as their most important reason for high school dropout. This pattern is the same as that obtained by Jordan, Lara, and McPartland (1996).

A similar study was conducted by Jordan et al. (1996) where the authors used data from the United States National Longitudinal Study of 1988, which was supported by the National Centre for Educational Statistics of the United States Department of Education. Jordan et al. investigated the various reasons why students drop out of high school and explored patterns relating to race and gender; they compared Hispanics, African Americans, and non-Hispanic Whites. Jordan et al. found that when the African American male and female groups were compared to Non-Hispanic Whites and Hispanics, both the female and male African American groups reported leaving high school early as a result of disciplinary actions taken by the school and having friends who were not enrolled in school, as primary reasons for dropping out before completion

(Jordan et al., 1996).

Newcomb et al. (2002) also examined racial background differences in high school dropouts but in conjunction with sociodemographic information. Newcomb et al. examined characteristics of 5th grade students from the Seattle Social Development Project, which is a longitudinal study that began in 1985. The researchers gathered a sample of 808 10-year-old students and followed their academic outcomes into 12th grade. Their sample was predominantly White European Americans from low-income households with 40% of the sample representing races other than White. The researchers used Structural Equation modeling and found significant correlations between high school failure and African American ethnicity. In addition, the authors found that Asian ethnicity was significantly correlated with less high school failure (Newcomb et al., 2002). Results from the author's final model revealed no direct, significant paths from ethnicity to high school failure (Newcomb et al., 2002). Instead, the effects of ethnicity on high school graduation were fully mediated by other influences (such as SES and home environment) included in the investigation (Newcomb et al., 2002).

In sum, the research on student background characteristics indicates that males are at a higher risk than females for high school dropout, and that students from lower income or socioeconomic homes are at a higher risk of high school dropout. In addition to gender, income, and SES, race was also determined to have a strong relationship with high school success and/or failure. The research suggests that students from non-White racial and ethnic backgrounds are at a higher risk for leaving high school before completion for a variety of reasons, the most influential being peer influences and family influences, indicating that the racial background of students may play a significant role in

their likelihood of completing high school, whether voluntary withdrawal or school enforced suspension/expulsion.

Students' emotions, behaviours, and school performance.

Emotional characteristics.   The school experiences of children are highly impacted by their academic performance and their home environment, but perhaps even more so by their personal and psychosocial characteristics. A child's socialization and learning can be radically influenced by his/her personality characteristics and social skills. Children's behaviours can range from very reserved or anxious to highly aggressive and disruptive.   Research has shown that children who are shy, highly anxious, sad, depressed, and worrisome may not perform as well academically or get along as well with their classmates compared to children who are confident, self-assured, and psychologically stable (Duchesne, Vitaro, Larose, & Tremblay, 2008).   Because emotions may play an important role in a student's academic success, it is essential to examine at what age emotions can impact the student's long-term school success. In particular, emotional well-being in elementary school may impact high school completion.

Duchesne et al. (2008) attempted to determine the predictive power of children's levels of anxiety in kindergarten to grade 6 on high school dropout after controlling for gender, classroom behaviours, academic achievement, and family characteristics. Duchesne et al.'s (2008) definition of anxiety focuses on children's cognitive and emotional states such as fearfulness, worry, and crying.   Their results indicated that highly anxious students were more likely to drop out of high school than students who were moderately anxious (odds ratio = 1.50, $p < .01$), even when the predictors were

controlled for confounding variables. In a similar study, Duchesne, Larose, Guay, Tremblay, and Vitaro (2005) reported that children who demonstrated symptoms of anxiety in kindergarten were more likely to encounter academic difficulties by the end of their first year of high school. Ialongo et al. (1995) also discovered a similar pattern, they found that students who were rated as highly anxious in grade 1 were more likely to have lower academic achievement abilities by the end of grade 5 when compared to children in grade 1 with lower anxiety.

Janosz et al. (1997) attempted to identify the most powerful predictors of high school dropout and the stability of these predictors over two cohorts of boys and girls ages 12 to 16 in 1974 and 1985. The researchers gathered data using the self-report Jesness Invenotry pertaining to each participant's quality of peer relationships, degree of deviant behaviours such as aggression, social anxiety, depression, and other neurotic behaviours. Through logistic regression, the researchers found that high levels of behaviour problems in childhood, repression (which included suppression of anger and frustration), and neuroticism (which reflects emotional instability and a sense of victimization) were all predictors of high school dropout (Janosz et al., 1997). Although these psychological characteristics were found to be associated with high school dropout, the best predictors of high school dropout were found to be school grades and socioeconomic status (Janosz et al., 1997).

Barclay and Doll (2001) conducted a historical examination in the form of a literature review on high school dropout in the United States from 1950 to 1970. The authors found that research conducted as early as 1969 identified several childhood predictors of high school dropout that relate to a student's emotional well-being. In

particular, the authors discussed Hathaway et al.'s (1969) study where the researchers examined 28% of Minnesota's 9th-grade students in the 1953-1954 academic years. Hathaway et al. (1969; as cited in Barclay and Doll, 2001) found that students who dropped out of high school had higher scores on the apathy, difficulty thinking straight and withdrawal scales of the Minnesota Multiphasic Personality Inventory (MMPI) when compared to students who completed high school.

The issue outlined throughout the current study is that each child's psychosocial composition may have the ability to directly or indirectly impact his/her academic achievement or possibly even his/her likelihood of completing high school as evidenced by Barclay and Doll (2001), Janosz et al. (1997), and Duchesne et al. (2008). Initiatives for targeting students at risk for high school dropout at an early age should attempt to include efforts aimed at improving student's emotional well-being, while at the same time targeting their potential academic and socioeconomic vulnerability. Educational efforts must transcend beyond simply examining the learning styles and comprehension of a student's academic abilities and start treating the student as a whole person.

Hyperactive and inattentive characteristics. Some of the most highly researched and discussed areas of student development over the last decade have focused on the difficult or at-risk student. The difficult student has been characterized as one who exhibits attention difficulties, aggressive behavioral outbursts, or hyperactive mood swings (Gresham, MacMillan, Bocian, Ward, & Forness, 1998). Children who display such challenging behaviors may be plagued with stressful school and home experiences as parents and teachers struggle to manage their attention difficulties and behavioural struggles. A diagnosis of Attention Deficit Hyperactive Disorder (ADHD) can be

accompanied by prescription medication to manage the severity of the child's behaviours; however, this does not guarantee an immediate or consistent change in a child's behaviour, particularly if medication is forgotten, lost, or ineffective.

Recently, poor academic outcomes including school dropout, have been proposed as one of the most pervasive risks associated with ADHD (DuPaul et al., 2004). ADHD is frequently associated with deficits in academic skills and performance (DuPaul, 2007). However, research has documented a discrepancy in standardized achievement scores of children with ADHD; children with a diagnosis of ADHD scored lower than their nondiagnosed counterparts (DuPaul, 2007).   The extent to which the behaviours associated with ADHD at the elementary level are predictive of high school dropout remains somewhat unexamined.

Vitaro et al. (2005) found a significant association between a child's hyperactive behaviour and high school dropout. Most notably, they found that a child's level of hyperactive behaviors makes more of a contribution to high school dropout than aggressive behaviours (Vitaro et al., 2005). Specifically, the researchers found that children who displayed average and high levels of hyperactive behaviours were more likely to drop out of high school when compared to children with low hyperactive behaviours. Children who displayed highly aggressive behaviours were more likely to drop out when compared to children who displayed average and low levels of aggressive behaviours, indicating a stronger association between aggression and hyperactive behaviours and high school dropout (Vitaro et al., 2005). Although Vitaro et al.'s study remains one of few to report such a strong finding, this particular area does warrant further investigation into child characteristics that are associated with high school

dropout. ADHD is characterized as a life-long disorder that needs to be managed through ongoing treatment that is individualized for each child and appropriate for their developmental age (Du-Paul & Stoner, 2003). In order for disruptive and hyperactive behaviours to be properly addressed in the school system, intervention efforts should start early in the student's academic career. By providing students with support services aimed at minimizing the social and academic impact of ADHD behaviours, the student's likelihood of completing high school may, in fact, increase.

Aggressive behaviours. Aggression towards others (whether physical or emotional), delinquency, and violence, are some of the extreme childhood behaviours that can be associated with negative life-long outcomes such as high school dropout. It comes as little surprise that students who are defiant, angry, and aggressive will get into trouble at school more often than children who do not display such extreme behaviours. Students who are disruptive and aggressive will be subjected to classroom removal, suspensions, and sometimes perhaps hostility from other classmates and teachers who feel frustrated and helpless to manage and redirect such behaviours (Véronneau et al., 2008). As a result, students who display aggressive behaviours may be negatively impacted socially and academically. Therefore, it is important to detect whether early aggressive behaviours impact or predict high school dropout. The following section will discuss the investigations that have been conducted in this area thus far.

Véronneau et al. (2008) gathered behavioural observations of students from parents and teachers during childhood and preadolescence and examined their impact on high school graduation. The researchers examined correlations among early childhood predictors and high school dropout as well as Path Analysis on high school dropout. The

researchers also discovered that prosocial skills in early childhood were associated with higher levels of academic achievement during adolescence, putting students at a lower risk of dropout from high school (Véronneau et al., 2008). Most notable in this research is the finding that childhood aggression and disruptiveness presented a significant direct path to high school dropout (Véronneau et al., 2008).

Newcomb et al. (2002) gathered data from a longitudinal study conducted by the Seattle Social Development Project. These investigators looked at each of the student's behavioural problems in childhood, as measured by the Child Behaviour Checklist (CBCL). High scores on the CBCL indicate the child's behavioural problems are highly aggressive in nature. Each child's respective teacher recorded the behaviours of each child using the CBCL, and their educational status was followed up through school records provided by each student's school board. Their analyses revealed that high school failure in general was significantly correlated with low academic competence and high levels of behavioural problems (Newcomb et al., 2002).

Farmer et al. (2003) looked into individual characteristics of 475 7th grade students from the Carolina Longitudinal Study. The authors focused their research on levels of aggression and popularity among 7th grade students and their risk for dropping out of high school. Information on dropout status was gathered though school records. Measures of aggression were obtained using the Teacher form of the Interpersonal Competence Scale (ICS). Their results showed that mean scores on the ICS among highly aggressive female participants who dropped out of high school were found to be significantly higher when compared to lower aggressive females who did not drop out of high school (3.72 and 4.85, respectively; Farmer et al., 2003). Furthermore, highly

aggressive males and females showed a significantly higher dropout rate when compared to lesser aggressive males and females (Farmer et al., 2003). Risi, Gerhardstein, and Kistner (2003) investigated children's peer relationships as measured by their level of aggression, which included peer perceptions of aggressiveness, withdrawal, and likeability, and later educational outcomes in a 10-year longitudinal study of children aged 9 to 11. Their analyses found that aggression was the sole child predictor of graduating high school. More specifically, the students who graduated high school were less aggressive when compared to students who dropped out of high school (Risi et al., 2003).

Ensminger and Slusarcick (1992) also examined several factors and their impact on later high school dropout in a sample of grade 1 students in Chicago. Factors investigated included the child's cognitive and behavioural performance, including aggressive behaviours and poor social behaviours. Their results revealed that children who were rated as aggressive in grade 1 were less likely to graduate high school.

Kokko, Tremblay, Lacourse, Nagin, and Vitaro (2006) looked at the trajectories of prosocial behaviour and physical aggression between 6 and 12 years of age in a sample of 1,025 male students from Montreal. Prosocial behaviour and physical aggression were used to predict school dropout at age 17. Data on each participant's physical aggression and prosocial behaviours were gathered by the teacher most knowledgeable about the student and recorded at ages 6, 10, 11, and 12. The researchers used logistic regression to determine if any of the predictor variables were significantly associated with high school dropout. The researchers discovered that aggression was significantly related to later school dropout, but that prosociality was not (Kokko et al., 2006). The researchers also

determined that high levels of aggression at age 6 decreased with time but that low and moderate levels of aggression stayed stable over time. Highly aggressive boys were 6 times more likely to drop out of school when compared with nonaggressive boys (Kokko et al., 2006). Kupersmidt and Coie (1990) also discovered that aggression was a significant predictor of high school dropout

The case for aggression in young children impacting long-term educational outcomes appears to be compelling. This is not to say that all aggressive children will have a negative educational outcome, but it does indicate that highly aggressive children warrant special attention and further research; they appear to represent a population of children at a high risk for negative educational experiences. Children's emotional states and behaviours can influence each other. Students are taught how to socialize and function in a collective group with peers and leaders. But what happens when the characteristics of a child, such as their emotions, behaviours, or psychological issues, impair their ability to function in the group setting in a healthy and socially acceptable manner? Does this setback impact a child's ability to succeed in the school organization, academically or socially?

Social skills. A student may encounter academic difficulties or withdraw from school early for a number of reasons. Even students who excel in academia are susceptible to severe social roadblocks that could steer them down the wrong path. Englund, Egeland, and Collins (2008) examined the early social skills of 179 children from low socioeconomic mothers and followed their development until the age of 23 in Minneapolis. They gathered follow-up data on whether or not each child dropped out of high school. The researchers evaluated the participants' social skills and behaviours at

age 12 and the participants' high school status at ages 19 and 23. Logistic regression analyses revealed that behavioural problems at age 12 predicted high school dropout later in life (Englund et al., 2008). Repeated measures ANOVA revealed that the levels of social competence among high school graduates were significantly higher compared to those who dropped out of high school (Englund et al., 2008).

French and Conrad (2001) researched levels of antisocial behaviours and social preference and their impact on high school graduation among 516 8th-grade students in the Pacific Northwest of the United States. According to the authors, the participants' ratings of social preference and antisocial behaviour were captured from their same-age, same-sex peers during group assessment sessions, and graduation status along with academic achievement was obtained through school records. The authors reported that they found significant differences between dropouts and graduates on social preference and antisocial behaviour. The results from this investigation indicated that the graduate group showed higher mean levels of social preference and lower mean levels of antisocial behaviour when compared to the dropout group.

Kupersmidt and Coie (1990) conducted an in-depth examination into the social relationships of a group of 11-year-olds from Durham County, North Carolina who were followed for 7 consecutive years to measure the impact of peer rejection, school functioning, social preference, and aggressive behaviour on later school adjustment which included early school withdrawal without completion. Data were gathered through participant interviews and school records. Upon follow-up analyses using only peer rejection and social preference as predictors, the researchers found that students who

were rejected by their peers were proportionately more likely to drop out of school than any other students.

Overall, research indicates that several personal characteristics, such as hyperactivity, inattention, aggression, and poor social skills, each contribute to a student's long-term academic success. Specifically, the evidence suggests that students who have been diagnosed with ADHD, who are highly aggressive and who possess poor social skills, at an early age, are at a higher risk for high school dropout when compared to their peers without these issues.

School performance.

Academic achievement.   One of the most researched and discussed early childhood factors that can be associated with high school dropout is academic achievement (Entwisle, Alexander & Olson, 2004). It is not surprising that students with low grades throughout their schooling will be at a higher risk for not completing high school. However, a debate still remains whether or not this factor alone is related to high school dropout or whether academic achievement is the result of a compounding effect of interacting variables that could potentially lead to high school dropout (Véronneau et al., 2008). The compounding variables could include other school related factors such as work habits and/or teacher related factors.

Robertson (2007) examined academic achievement in 15-year-olds who participated in the Youth in Transition Study in Canada. Many of the 15-year-olds who were dropouts in this study were already struggling with academics, with 32% of the students who dropped out reporting an average mark of 59% or less (Robertson, 2007).

Véronneau et al. (2008) conducted a longitudinal study in this same area where they compared students with low, moderate, and high academic achievement in elementary grades and high school dropout. They found that participants with higher levels of academic achievement in childhood had higher levels of academic achievement in preadolescence and presented a lower risk of dropping out when compared to participants with lower levels of academic achievement in childhood. In addition to these findings, the researchers discovered that demonstrated prosocial skills in early childhood were associated with higher levels of academic achievement during adolescence, which put them at a lower risk to drop out of high school (Véronneau et al., 2008). Most notably in this research is the finding that academic achievement in elementary school predicted high school dropout over and above academic achievement in secondary school (Véronneau et al., 2008). This finding further supports the pressing need for intervention among elementary school students to reduce the risk of early high school dropout.

Hickman et al. (2008) also examined differences in academic achievement levels among a sample of 1st grade to 9th grade students from Arizona using the Stanford Achievement Test (SAT), which is an American standardized test of achievement. They investigated how students' scores on the SAT related to later high school graduation and dropout. The researchers in this case found that 3rd grade reading and math performance of high school dropouts was significantly lower when compared with the 3rd grade reading and math performance of high school graduates.

Jimerson et al.'s (2000) results also demonstrate a direct relationship between early academic achievement and high school dropout. The authors found that the child's level of academic achievement in 6th grade significantly contributed to the prediction of

dropping out of high school when early family and home variables were controlled. Other research also has indentified a strong predictive relationship between early academic achievement in the elementary grades and later high school dropout among children (Battin-Pearson et al., 2000; Janosz et al., 1997, Kaplan, Peck, & Kaplan, 1997).

Englund et al. (2008) examined the academic achievement of 179 Minneapolis school children from low socioeconomic mothers and followed their development until the age of 23. Follow-up data on their success as adults were gathered, more specifically, whether or not the children dropped out of high school. The researchers evaluated the participants' level of academic achievement at age 12 and the participants' high school status at ages 19 and 23. Logistic regression analyses revealed that academic achievement and behavioural problems at age 12 predicted high school dropout later in life.

The research reviewed clearly outlines a relationship between early academic achievement and high school dropout, with students who perform poorer on measures of academic achievement as children showing higher rates of dropping out of high school. However, the research also demonstrates how this relationship may be influenced or exacerbated by other factors such as socioeconomic status and aggression.

Classroom work habits. When discussing students' academic success, there are several things to consider, all of which may have an impact on how well students perform academically. One such issue to consider would be how academic achievement is affected by outside variables besides intelligence. Could academic achievement be the result of an impairment or deficiency in the way in which the student organizes and completes his/her schoolwork? Have low-achieving students been taught how to organize their notes, study properly, and complete their homework in a conducive setting? Do low-

achieving students possess the necessary work habits required to succeed at homework and studying? Not surprisingly, research in this area is very limited.

Bempechat (2004) may be one of the few researchers that discusses the role that homework completion plays in the long-term development of a student's achievement motivation. Bempechat argues that homework assignments provide young children with the time and experience they need to develop their own understanding of achievement and study habits both of which are crucial in the learning process. Bempechat emphasizes the need to prepare children at an early age for the demands of later academic learning and the need to develop positive homework behaviours that will help children take ownership of their learning and sustain these positive homework behaviours later into adolescence. It would appear as though very few studies have examined the link between children's homework behaviours and work habits in the primary grades and their influence on high school dropout as most research examines only the link between work habits and academic achievement. This area of investigation is important to examine as the Ontario Ministry of Education has begun to introduce full-day kindergarten. If the government's strategy is to educate students at an earlier age, then researchers need to start examining the earliest factors that are associated with negative long-term educational outcomes.

In sum, it is clear that elementary school academic achievement shows a strong predictive relationship with high school graduation and dropout. However, these findings by no means tell the whole story. Children's performance in school can be drastically impacted and influenced by numerous other factors such as family, personality, and even social abilities. Teachers have the unique opportunity of witnessing first hand how

classroom work habits differ among students from various social backgrounds, as such, their characterizations and reporting of students' work habits may prove insightful when examining early predictors of high school dropout.

Parental Influence

Parents play a pivotal role in a child's educational and social development through the degree of educational support and general involvement they offer their children. The parental influences examined in this discussion represent the microsystem and exosystem of Bronfenbrenner's theory of ecological development.

Parental involvement. Children require a great deal of positive engagement with their parents throughout their upbringing to feel important to their parents and to feel secure in their endeavours outside of the home (Anguiano, 2004). The extent to which parents involve themselves in their child's academic experiences will impact their child's perceptions about school and its importance, which includes their successes or setbacks in school (Chavkin & Williams, 1993). High parental involvement with teachers and school activities can help to identify a child's struggles early and help minimize any damage that the child may experience as a result of his/her school related difficulties (Chavkin & Williams, 1993). Anguiano (2004) explored the relationship that exists both within the family system and between the family and the education system. This study used the American National Education Longitudinal Study (NELS) of 1988. The NELS data set included approximately 25,000 8th graders, parents, and school personnel. The data set included in this research involved a group of 8th graders who were followed throughout high school and for 2 years after their scheduled date of high school graduation. Traditional parental involvement was defined by the authors as the frequency

of parental contact with the school and its personnel. Parental involvement was measured through interviews with each parent and by looking at the parent's attendance at parent-teacher meetings, by parent's attendance when their child was participating in a school activity and by their help with their child's homework as recorded by the student's teacher.

Parental advocacy involvement was measured by looking at the parent's involvement in the school's policies and the parent–teacher organization at the school and was examined statistically using a hierarchical linear model (HLM) (Anguiano, 2004). The high school completion model showed that traditional parental involvement and parental advocacy involvement were significant predictors of high school completion. The author's findings indicate that in addition to parental involvement, the parent's participation also made a difference as to whether an adolescent completed high school. These findings support previous research indicating that different types of parental involvement are important indicators of whether a student completes high school (Chavkin & Williams, 1993).

Hickman et al. (2008) used a statewide survey in the United States to determine what the majority of parents believe are the contributing factors for high school students dropping out. According to Hickman et al., 2008, 30% of the respondents indicated that "home background" and "lack of parental involvement" were primary reasons why students dropped out of high school, which indicates that "family environment" was the most recorded response. The evidence from this study further supports an ecological model of high school dropout, indicating that the perception held by most parents is a compounding factor of high school dropout.

In addition, Oyserman, Brickman, and Rhodes (2007), describe parent–school involvement as an association with better school outcomes because of its more proximal effects on children's sense of who they can become. The authors argue that parent–school involvement often co-occurs with other factors that contribute to a positive or negative school outcome. Oyserman et al. believe that when placed together, parent–school involvement is likely to connect with children's belief that school is either important or unimportant depending on the level of parental involvement provided (Oyserman et al., 2007). The authors main area of interest was for children with less involved parents. They theorized that the lack of parent–school involvement undermines school achievement and indirectly may cause children who are struggling to veer ''offtrack'' towards an unhealthy path of school development (Oyserman et al., 2007).

Hill and Taylor (2004) discussed how, in a new age of education where greater accountability is paired with increasing demands for children's achievement, schools and families have developed new relationships and have begun sharing the responsibilities for a child's education. According to Hill and Taylor, parental school involvement can be defined as consisting of the following activities: volunteering at school, communicating with teachers and other school personnel, assisting in academic activities at home, and attending school events, meetings of parent–teacher associations (PTAs), and parent–teacher conferences. Head Start, is America's largest intervention program for at-risk students. The Head Start program puts emphasis on the importance of parental involvement as a critical piece of children's early academic development; parental involvement can help promote positive academic experiences for children and can have positive effects on parents' self-development and parenting skills (Hill & Taylor, 2004).

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Eccles and Harold (1996) believe that parental–school involvement decreases as children move to middle and high school because parents may believe that they are unable to assist with more advanced subjects and because adolescents are becoming more and more independent and self sufficient (Eccles & Harold, 1996). According to Hill and Taylor, as parents establish relationships with school personnel, they learn important information about the school's expectations for behavior and homework. They also learn how to help with homework and how to augment their children's learning at home.

Tan and Goldberg (2009) provide one of the most comprehensive investigations of parent involvement on high school dropout. In their analysis they found that having at least one highly involved parent was more advantageous for children's enjoyment of school than having two low involvement parents. As the authors had predicted, children with two highly involved parents enjoyed school more than children with two low involved parents (Tan & Goldberg, 2009). Studies have also shown that parental involvement in children's homework is crucial to developing positive attitudes and study skills, which is also essential for school success (Hoover-Dempsey et al., 2001).

Jimerson et al. (2000), also found parental involvement at age 12 to be significantly associated with high school dropout at age 19. Englund et al. (2008) examined various levels of parental involvement and academic achievement in a group of 179 children. Their results suggest that high school graduates in this sample had significantly higher levels of parental involvement when compared to high school dropouts.

Studies overall indicate a relationship between parental involvement and future high school completion. In particular, low parental involvement seems to be associated

with dropout from high school. Although parental involvement has not been found to be a sole predictor of high school dropout, its influence is integral when discussing an ecological theory of high school dropout, as it has been shown to seriously impact a child's future academic success.

    Parental support.   In the same context of parental involvement lies parental support, which can be defined as the extent of support a parent or guardian offers a child in his/her academic endeavours. Parental support can include help with homework completion, creating and enforcing a stable and healthy routine at home, or simply providing the necessities required for school success such as proper outdoor clothing and food for lunches. All of these factors can contribute to a child's personal, social, and academic success at school.

    Alexander, Entwisle, and Kabbani (2001) examined parental support, in the form of parental attitudes regarding their child's school success, and its associated risk of high school dropout. They found that low parental support was associated with a far higher dropout risk, regardless of when parental attitudes were assessed. The authors reported that approximately 56% of children dropped out when parental support was low versus 27% when parental support was high. It seems that supportive parents help move children along the path of school completion.

    Other evidence indicates alternative characteristics of parents that could be associated with high school dropout. Rumberger, Ghatak, Poulos, Ritter, and Dornbusch (1990) conducted a study in one California high school where they explored a series of variables that revealed some of the mechanisms by which families influence students' decisions to drop out of school. Rumberger et al.'s study was designed to complement a

larger statewide project, which gathered dropout information on over 150 students through 1985–1986. The authors examined the influence of families on students' decisions to drop out of school. Their results suggest that families exert an important influence on various measures of students' academic achievement including dropout behavior. In particular, parents of dropouts may have negative attitudes regarding school success (Alexander et al., 2001) or they may be distracted with family or other personal matters to offer their children the support they need. In contrast, parents who offered encouragement, praise, and other positive responses allow their children to be responsible for their own behavior. According to the authors this helps children develop internal motivation and improves their academic performance.

There appears to be a consensus that parents impact their child's educational development as well as their personal and psychological well-being. It appears to be crucial to include parents in any investigation of predictors of high school dropout. Determining a parent's level of support for their child's schooling may prove to be difficult depending on the source used in determining the parent's level of support. Self-report data on parents' levels of involvement and support may be unreliable; therefore, it would be most advantageous to utilize a perspective outside the family home, one that is directly involved in the child's schooling (such as their teacher), to comment on parental involvement and support.

Teacher and School Related Factors

As part of the ecological theory of child development, the microsystem and mesosystem include relationships and interactions involving the child, directly or indirectly, with people who are included in their immediate environment. At home, these

relationships would involve the interactions the child has with parents and siblings and at school these relationships would involve the interactions between the student and teacher and their peers. Additionally, the interactions that the child's parents and teachers have with each other would fall under the exosystem and macrosystem levels. The hidden and overt curriculum that the students are exposed to at school may also influence how they react and respond to their teachers who are directly or indirectly imposing the policies and regulations under which they practice. Ministry guidelines, policies, and mandates are related to the macrosystem and chronosystem of the child's development. These relationships and systematic proceedings also contribute to the unique development of each student.

Teacher efficacy, experience, and expectations. The teacher factors discussed herein relate to the level of support and involvement that teachers have on students' academic and personal success and can be understood as teacher efficacy. Teacher efficacy is defined as the degree to which teachers believe they can impact student success and teacher expectations of how far each student will go in his/her academic career. In addition to teacher efficacy and expectations, teacher experience was also investigated pertaining to student success.

Knesting (2008) investigated how interactions with the teacher and the school influence a student's decision to drop out of high school. Knesting conducted interviews with 17 high school students who were at risk for dropping out and 7 teachers who had, at one point, taught each student. Teachers who believed that all students could succeed at school were described by students as possessing a positive characteristic that supported their efforts to persist in school. The students in this investigation described this positive

teacher characteristic as a teacher who "provides a classroom where there were high expectations", "academic challenges", and where "safety and respect were the norm". In this study, the highly regarded teacher was characterized as having high expectations for all students and regardless of ability level or future plans and that this teacher worked hard to communicate this belief to the students. Several students reported that a climate of acceptance made the classroom a supportive environment and contributed to their positive view of each teacher. One teacher, in particular, who was described by almost every student as being supportive, was observed interacting similarly with all students. According to Knesting, this teacher's behavior communicated to the students that each of them had something to contribute and every contribution was valid and worth hearing. The students knew that this particular teacher cared about them and that she would be upset and angry if they left school prior to graduation. According to Knesting, this may have influenced the student's decision to persist in school as far as they did.

According to Knesting (2008), educators must look at factors within the schools and the possible interactions between schools and students as potential risk factors associated with students leaving high school before graduating. In Knesting's study she found that student–teacher interactions, disciplinary procedures, curricula, and even the district policy designed to keep students in school contributed to the estimated annual dropout rate of 40–60%. In sum, Knesting suggests that schools should accept responsibility for improving and making changes within their own organization or climate that will support student persistence and increase the likelihood that they will finish their education. Her findings indicate that within school factors can also contribute to high school dropout.

Tilleczek, Ferguson, Anneke, Rummens, and Boydell (2006) interviewed a group of 193 teenagers who had either left school early or were at risk of doing so. They found that the majority of students interviewed described passivity and–or a lack of flexibility on the part of school personnel or school policies as school related risk factors for dropping out. The authors found that many students in their investigation spoke of "negative relationships with principals and teachers", a "curriculum that was too difficult", a "lack of support with schoolwork", a "lack of recognition of differing learning styles", and a "climate that was simply not enjoyable" and subsequently not conducive to learning as major reasons for their decision to drop out of high school.

In addition, Vallerand, Fortier, and Guay (1997) conducted research in this area with over 4,000 high school students in grades 9 and 10 across Montreal, using a prospective design. Vallerand et al. examined a motivational theory of high school dropout by comparing the level of perceived support from teachers, parents, and administration on the level of autonomy of students and persistent students (students who never dropped out of high school). A motivational theory of dropout suggests that reasons for dropping out might originate within the student but manifest in environmental settings such as school. Their results showed that a motivational model of high school dropout did, in fact, exist, and that dropout students perceived their teachers, parents, and school administration as being less supportive of autonomy when compared to persistent students.   This indicates that the support and encouragement from teachers and administrators may be crucial in keeping students in school.

Although the age groups used when examining the area of teacher involvement and high school dropout are typically those of current high school students, it was

decided to include teacher involvement at the elementary level in the current investigation to identify whether or not this variable at an early age would contribute to students' high school academic success. By examining teacher involvement at an early age, it can be determined whether early teacher involvement lays a foundation for future academic success or failure. Few studies have examined this area at an early age, but one such study examined the long-term consequences of kindergarten teacher management style on academic achievement and its related potential to high school dropout in a large sample of Quebec children (Vitaro et al., 2005). Even though the authors reported no direct link between teacher management style in kindergarten and high school dropout, teacher management was found to relate to two of the parental education attitude factors. The parental education factors were predictive of high school graduation status of the participants in young adulthood, indicating that teacher related factors may indirectly or in combination affect a child's future educational development.

Class size. The influence of class size has long been debated in the research surrounding student achievement. Little research has been conducted in the area of class size in early grades and its impact on later academic achievement, such as high school dropout. There are several reasons for this lapse in research. Most important, class sizes typically change from year to year making it difficult to attribute any unique influence in early grade class size on later academic outcomes. There is some research that indicates a relationship between class size and academic achievement exists.

Finn, Gerber, and Boyd-Zaharias (2005) investigated the long-term effects of early school experiences, such as class size and academic achievement, in a large sample of students from kindergarten to grade 3 in Tennessee. Their findings indicate that small

class sizes did impact high school dropout. Specifically, the researchers found that classes of fewer than 20 students in 3 consecutive years between kindergarten to grade 3 had a significant positive association with high school graduation when compared to students attending larger size classes from kindergarten to grade 3. Their results indicate that the more years a child spends in small classrooms in the first years of schooling, the higher their odds of completing high school, even after controlling for the early effects of academic achievement on high school graduation. These findings indicate that class size may play an important role in the study of high school dropout.

Summary

In Chapter Two, several personal, parental, teacher, and school related characteristics of young children were identified through empirical and nonempirical research as contributing, and even predicting, high school dropout. In reviewing the literature, some gaps in the research were also identified surrounding high school dropout. First, the majority of the research available for this study focused primarily on gender, socioeconomic status, income, aggression, and academic achievement. These areas were the most highly researched topics when examining early childhood predictors of high school dropout. Although literature was found to support various child characteristics: social skills, hyperactivity and inattention, emotional disorder characteristics, and social skills, the research regarding personal characteristics is somewhat limited and was typically included as secondary predictors to aggression, SES, gender, and income.

Second, the research reviewed on parental characteristics was somewhat inconsistent due to difficulties in describing parental involvement and support. Some of

the research discussed parental involvement and support as it existed in the home (Hickman et al., 2008; Tan & Goldberg, 2009) and some of the research discussed the parent's direct level of involvement with the child's schooling efforts (Anguiano, 2004). Therefore, the importance of parental involvement and support on high school dropout still remains unclear.

Third, the research reviewed on teacher and school related factors indicates that, although the influence of the teacher is crucial to the child's academic success, the extent and the age at which the teacher and school related influences begin to predict high school dropout is still undetermined.

Given the available evidence and suggested research areas, the current investigation addressed the gaps highlighted in the research reviewed, and added to this discussion by examining several early childhood predictors of high school dropout at the personal, parental, teacher and school levels using longitudinal data gathered on elementary students across Canada.

Purpose

The purpose of the current research study was to investigate early predictors of high school dropout using an ecological framework and a longitudinal design. Specifically, the likelihood that a student's background, personal characteristics, behaviours, and school performance predict whether or not they complete high school. This research also investigated the likelihood that parental involvement and support will impact a student's likelihood of dropping out of high school, along with the likelihood that teacher efficacy, expectations, experience, and class size will impact the student's high school dropout status.

Research Hypotheses

The following hypotheses were derived from the review of current literature and were organized according to Brofenbrenner's (1979) theory of ecological development. The hypotheses were organized according to students' background and personal characteristics (which represents the microsystem), school performance (which also represents the microsystem), parental involvement (which represents the mesosystem and exosystem), and teacher and school related factors (which represents the macrosystem and chronosystem).

1. Differences in a student's background characteristics will impact the student's odds of dropping out of high school. Specifically, their odds of dropping out will increase if they (a) are male (b) come from families with low levels of socioeconomic status, low-income households, or (c) are classified racially as non-White.

2. Differences in a student's personal characteristics will impact his/her odds of dropping out of high school. Specifically, the student's chance of dropping out of high school will increase if he/she (a) has negative behaviours and negative personality traits such as poor emotional characteristics, aggression, and hyperactive-inattentive characteristics, as well as poor interpersonal skills and poor social skills, or (b) has poor school academic achievement and poor classroom work habits.

3. Differences in parental influence will impact the odds of dropping out of high school. Specifically, the student's odds of dropping out of high school will increase if he/she (a) has low levels of support from his/her parents regarding

his/her school efforts, or (b) has low levels of parental involvement in his/her school efforts.

4. Differences in teacher and school related factors will impact the student's risk of dropping out of high school. Specifically, the student's odds of dropping out of high school will increase if his/her teacher (a) has low expectations for the student's long-term school success, (b) has poor efficacy as a teacher, (c) has experience, or (d) is teaching a larger than average class size.

Methodology

This study used data gathered in cycles 2, 6, and 7 of the National Longitudinal Survey of Children and Youth (NLSCY). The purpose of the study was to examine the personal, parental, teacher, and school related variables, associated with an increase in the likelihood of an individual dropping out of high school. The following sections describe the sample, the measures, and the research procedures including ethical considerations, data organization, and analysis.

Sample

As mentioned earlier, the NLSCY has gone through 8 cycles, each of which has been conducted every 2 years since 1994. The selection of participants for this study included all children ages 8 to 10 years old included in cycle 2 (1996–1997) of the NLSCY. This sample of respondents was followed up in cycles 6 (2004–2005) and 7 (2006–2007) to determine whether or not the student had successfully completed high school. High school dropouts, as defined earlier, were classified as students who were not currently enrolled in high school and who never completed the requirements for a secondary school diploma. The high school dropout variable was derived from the youth

component of the NLSCY, in cycles 6 and 7.

The sample included 1,138 students, 534 males and 604 females, ranging from age 8 to age 10, who were surveyed in the NLSCY in cycle 2 conducted in 1996. The sample was predominantly White with a family income of more than $30,000 per year after taxes and deductions. The majority of respondents were characterized as having a medium level of social economic status.

Measures

All questionnaires used in the NLSCY were developed by Statistics Canada in co-ordination with an expert advisory group (Statistics Canada, 2010). All instruments were tested in focus groups and pilot surveys prior to data collection. The NLSCY has information gathered directly from the parent(s) and teacher of each student as well as the student where applicable. The parent and student information was gathered by telephone during the designated survey period for each cycle. The interviews were conducted by a designated and trained Statistics Canada employee and were administered using computer-assisted technology (Statistics Canada, 2010). The teacher questionnaire component of the NLSCY was mailed to the principal of the school attended by each student in the survey whose parents had given consent. The principal then determined which of the student's teachers knew him/her best and should complete the questionnaire.

The following section describes the variables of interest to this study as obtained from the various data sources represented in the NCLSY. Details on how the actual scores for each variable were derived will be provided in the research procedure section, as applicable.

Independent variables. The independent variables fall under three categories: student related, parent related, and teacher and school related. With the exception of the student's background characteristics, which were obtained from information provided by the parents in cycle 2, all the other independent variables were obtained from the teacher questionnaire included in cycle 2.

Student personal related variables. Student related variables fall in three subcategories: background characteristics, personal characteristics, and school performance characteristics. Background characteristics are comprised of the student's age, gender, race, as well as family and home environmental characteristics, specifically, income and socioeconomic status. The personal characteristics include; emotional characteristics, hyperactive-inattention characteristics, aggression, social skills, and interpersonal skills. Finally, school performance characteristics are divided into two parts: level of academic achievement and classroom work habits.

Parent related variables. The parental influence variable was divided into two components, namely parental support (which pertains to the student's parent's level of support for their attendance and school preparedness), and parental involvement (which relates to the student's parent's level of involvement with the student's schooling efforts and the level of importance the parent places on schooling).

Teacher and school related variables. The variables in the teacher category fall into three areas, namely, teacher expectations, (which is characterized by the teachers' expectations for the student in the future), teacher efficacy (which pertains to the teachers level of support for their students and the emphasis they place on student success), and

teacher experience (which represents the length of time the teacher has been teaching, in years). The main school related variable considered was class size.

Dependent variable. The current investigation has only one dependent variable, high school dropout. Participants who were not currently enrolled in high school and had not completed the requirements for a high school diploma/certificate were considered high school dropouts. The dependent variable information was obtained from the participant in cycles 6 and 7.

Research Procedure

Ethical considerations. The first step of the research procedure was the issue of ethical considerations. Once ethics approval was granted by Nipissing University an application for access to Statistics Canada data was submitted, along with a research proposal, to the Social Sciences and Humanities Research Council of Canada (SSHRC) and Statistics Canada. Upon approval, a contract was signed with Statistics Canada, which allowed the study to be conducted, and granted the investigator access to the applicable microdata files. All of Statistics Canada's confidentiality rules were strictly adhered to, including the fact that where necessary, data were suppressed to prevent direct or residual disclosure of identifiable data (Statistics Canada, 2010).

Data organization and analysis. Using the data supplied by and accessible at the Research Data Centre in Ottawa, Ontario, a research database was created using information from all children ages 8 to 10 years old that were included in cycle 2 of the NLSCY. After the sample was selected for age, the database was reduced to include only the background characteristics of the children, specifically, their age, gender, socioeconomic status, income, and race. Next, the database that housed all the

information gathered through the teacher questionnaire was merged with the background database that was already created. The research database was now complete with all the independent variables needed for the current investigation.

The newly created database was then divided by age and separated into two different databases, one for children aged 8 and one for children ages 9 to 10. The databases were divided by age to ensure that follow-up data were gathered at the appropriate cycle. The last two databases that were included in the analysis came from cycles 6 and 7 of the NLSCY. Only two variables were extracted from each cycle, whether the student was still in high school and whether or not the individual had completed the requirements for a high school diploma. All remaining variables from the follow-up cycles were deleted from the databases. Cycle 6 was merged with the 8-year-old database and cycle 7 was merged with the 9 and 10-year-old databases. Both databases were then sorted by the variable that asked whether or not the individual was currently in high school. Any individuals who were enrolled in high school were deleted from the sample. From the remaining individuals who were not currently enrolled in high school, the item originally labeled "have you completed the requirements for a high school diploma" was relabeled as the "high school dropout" variable and responses were coded as yes or no. The two new age databases were then merged into the main research database.

Guided by the data analysis model suggested by Nunnally and Bernstein (1994), the following 6-step sequence was adopted for the remaining aspects of the research procedure: manage missing data, examine internal consistency, compute scale scores and describe remaining variables, assess multicolinearity, examine descriptive statistics, and

perform statistical procedure(s), in this case, binary logistic regression.

Step 1: Manage missing data. In the longitudinal samples of the NLSCY, attrition is common. Attrition rate in the NLSCY refers to the proportion of respondents remaining in the survey relative to the number of respondents at cycle 1. From one cycle to the next, respondents either drop out or are dropped out of the survey for a variety of reasons. For example, respondents would be dropped out after specified occasions of nonresponse, with the nonresponse being caused by such reasons as moving or death. As an example, at the beginning of cycle 2 there were a total of 16,903 respondents, which represented a cumulative longitudinal response rate of 79.1%. This rate continued to decrease to 76.0%, 67.8%, 63.1%, 57.6%, and 56.6% in cycles 3-7, respectfully (Statistics Canada, 2010). Correspondingly, there was a significant amount of data missing to be managed.

Thus, once the research database, as described in the previous section was in place, the next step involved recoding all of the nonquantifiable responses, namely "I don't' know," "not applicable," "I don't teach this subject area," and "don't know the parent(s) or guardian(s) well enough," into missing values as these responses could not be assigned a value and, therefore, could not be included in the analyses.

Next, a Missing Value Analysis was executed to identify whether or not there were distinct patterns in the missing data for the variables (SPSS, 2007). To begin, all variables with more than 10% of values missing were deleted from the database (Howell, 2002). To identify whether the remaining values in the database were missing completely at random (MCAR) or not, a second Missing Value Analysis was executed and the expectation-maximization (EM) method generated a Little's MCAR test, which was

nonsignificant. This finding is consistent with the assumption that the missing data were random. At this point, because data were missing completely at random, it was safe to single impute missing values. The remaining values that were missing were imputed during the process of computing the scale variables by single mean imputation.

Step 2: Examine internal consistency.   Internal consistency measures were computed for all items in each proposed scale to ensure the variables chosen met the acceptable Cronbach's alpha level of .70 or higher (Cronbach, 1951; Nunnally & Bernstein, 1994). The Cronbach's alpha is a measure of reliability and ensures that all items included in a scale measure the same construct. The Cronbach's alpha level is believed to indicate the degree to which a set of items measures a single one-dimensional construct. The higher the alpha level, the more accurate the scale is at measuring that construct (Cronbach, 1951). The scales and consistency values are as follows: emotional characteristics (.86), hyperactive/inattention (.82), aggression (.89), social skills (.81), interpersonal skills (.90), academic achievement (.92), classroom work habits (.90), parental support (.78), parental involvement (.79), and teacher efficacy (.72).

Step 3a: Compute scale scores.   The next step in the research procedure involved building the scale variables that were used for the personal, parental, and teacher characteristics. New variables were created by combining several questions from the teacher questionnaire that reported on the same attribute or behaviour of the student, parent and teacher.

When combining the list of variables for each scale, a single mean imputation was included in the computation equation for each scale. Scores were totaled for all questions included in the scale, and a mean value replaced a missing value when the majority of the

answers to the items in the scale, more than 50%, had numerical responses. Any cases that had missing value responses on more than 50% of the questions included in the scale were deleted from the sample.

All of the computed scale variables were obtained by totaling the teachers' responses to each question included in the scale and are outlined as follows:

Emotional score: Responses were coded from 1 to 3; 1 (*Never or not true*), 2 (*Sometimes or somewhat tru*e), and 3 (*Often or very true*) and represented how often a student displayed seven negative emotional characteristics. A student who has negative emotional characteristics would have scores that are closer to a value of 21, which is the highest possible score for this scale.

Hyperactive–inattention score: Responses were coded from 1 to 3; 1 (*Never or not tru*e), 2 (*Sometimes or somewhat true*), 3 (*Often or very true*), and represented how often a student displayed the 11 hyperactive-inattentive characteristics. A student who has negative hyperactive-inattentive behaviours would have scores that are closer to a value of 33, which is the highest possible score for this scale.

Aggression score: Responses were coded from 1 to 3; 1 (*Never or not true*), 2 (*Sometimes or somewhat true*), and 3 (*Often or very true*), and represented how often a student displayed the 11 aggressive characteristics. A student who demonstrates highly aggressive behaviours would have scores that are closer to a value of 33, which is the highest possible score for this scale.

Social skills score: Responses were coded from 1 to 3; 1 (*Never or not true*), 2 (*Sometimes or somewhat true*), and 3 (*Often or very true*), and represented how often a student displayed the nine positive social skills. A student who demonstrates poor social

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skills would have scores that are closer in value to 9, which is the lowest possible score for this scale.

Interpersonal skills score: Responses were coded from 1 to 5; 1 (*Never*), 2 (*Rarely*), 3 (*Sometimes*), 4 (*Usually*), and 5 (*Always*), and represented how often a student displayed the seven positive interpersonal skills. A student who demonstrates poor interpersonal skills would have scores that are closer in value to 7, which is the lowest possible score for this scale.

Academic achievement score: Responses were coded from 1 to 5; 1 (*Near the top of the class*), 2 (*Above the middle of the class but not at the top*), 3 (*In the middle of the class*), 4 (*Below the middle of the class but above the bottom*), and 5 (*Near the bottom of the class*), and represented how successful the student is (according to the teacher) in comparison to the rest of the class on the three academic achievement variables. A student who has a low level of academic achievement would have scores closer in value to 15, which is the highest possible score for this scale.

Classroom work habits score: Responses were coded from 1 to 5; 1 (*Never*), 2 (*Rarely*), 3 (*Sometimes*), 4 (*Usually*), and 5 (*Always*), and represent how often a student displayed the five positive classroom work habits. A student who has poor classroom work habits would have scores closer in value to 5, which is the lowest possible score for this scale.

*Parental support score***: Responses were coded from 1 to 5; 1 (*Never*), 2 (*Rarely*), 3 (*Sometimes*), 4 (*Usually*), and 5 A*lways*), and represented how often the teacher believed the student's parents displayed the six negative school characteristics. A student who had low levels of parental support would have scores closer to a value of 30, which

is the highest possible value for this scale.

Parental involvement score: Responses were coded from 1 to 3; 1 (*Very important*), 2 (*Somewhat important*), and 3 (*Of little importance*) on the first item. As well as 1 (*Strongly support*), 2 (*Somewhat support*), and 3 (*Do not support*) on the second item, and represented how much the teacher believed the student's parents were involved in their schooling efforts. A student who had low levels of parental involvement would have scores closer to a value of 6, which is the highest possible score for each item included in the scale.

Teacher expectations score: Responses were coded from 1 to 6 in ascending order of level of education the teacher believes the student will complete in the future. Values in the scale range from lowest to highest and the scale starts with completing elementary school and goes up to completing a university degree. A teacher who has low expectations for the student would assign a score closer to a value of 1.

Teacher efficacy score: Responses were coded from 1 to 5; 1 (*Strongly disagree*), 2 (*Disagree*), 3 (*Neither agree nor disagree*), 4 (*Agree*) and 5 (*Strongly agree)*, and represented how much the teacher believed they were exhibiting the five positive teacher competencies. A teacher who had low levels of teacher efficacy would have scores closer in value to 5, which is the lowest possible score for this scale.

Income: Income level responses were coded from 1 to 4; 1 (*less than 10,000)*, 2 (*10,000 to 19,999*), 3 (*20,000 to 29,999*), and 4 (*30,000 and up*) and represented the family's total income from all sources after taxes and deductions. A category of "*39,999 and up"* was collapsed into the "*30,000 and up"* category by the researcher due to disclosure restrictions imposed on the current research study by the Research Data Centre

of Statistics Canada. For the purpose of this research study, income was treated as a scale variable given that the values range from lowest to highest.

Step 3b: Describe remaining variables.

Gender: Males and females were coded as 1 (*female*) and 2 (*male*).

*Race***:** The 12 categories for racial backgrounds were collapsed into two categories due to disclosure rules imposed on the current research by the Research Data Centre of Statistics Canada. The remaining two categories were coded as 1 (*White*) and 2 (*non-White)*.

*High school dropout***:** High school dropouts were determined by the respondent answering "yes" or "no" to whether or not they completed the requirements for a high school diploma. The responses were coded as 0 (*yes*) and 1 (*no*). A student was categorized as a high school dropout when his/her score on this variable was equal to 1.

Age: Each participant's age (in years), was reported by the Person Most Knowledgeable (PMK) about the child in cycle 2 of the NLSCY.

Socioeconomic status (SES): Values for the socioeconomic status of each student's family were originally computed by Statistics Canada. The SES index for each participant is derived from three variables; parent's level of education, parent's level of income, and the level of prestige for each parent's occupation. The values range from 1.5 (and up) to -2.0 (or less). A value close to 0 on this measure of SES, for example, would indicate that the student's parents would be high school graduates, the parent would be semiskilled in a clerical field but possibly not in the labour force and the spouse would be semiskilled in manual labour and the total household family income would be approximately $55,000. For a more thorough explanation of what constitutes high and

low SES scores, see Appendix D. For the purpose of this study, the SES values for each student were extracted directly from the NLSCY cycle 2 database.

Teaching Experience: Represents the total number of years the student's teacher has been teaching.

Class Size: Represents the total number of students in the teacher's class.

Step 4: Assess multicolinearity. The next step in the research procedure involved measuring the mulitcolinearity of the independent variables. This step was executed by producing a Pearson Correlation Coefficient matrix for all applicable variables and then examining the values. Correlations that exceeded 0.7 were determined to indicate multicolinearity (Nunnally & Bernstein, 1994; Rumsey, 2007). Any highly correlated variables were not to be included in the same logistic regression analysis.

Step 5: Examine descriptive statistics. The next item included in the research procedure was running descriptive statistics for all independent and dependent variables. Measures of central tendency and variability were selected in the descriptive analysis and included generating and evaluating means, ranges, maximum and minimum values and standard deviations for all variables in the analysis.

Step 6: Perform statistical procedure(s). Binary logistic analysis was used with the independent variables mentioned previously as predictor variables, and high school dropout as the outcome variable. Logistic regression was chosen for the current research analysis because it requires a binary dependent variable. Leech, Barrett, and Morgan (2004) suggest that, because no assumptions are made about the distribution of the predictor variables used in logistic regression, the researcher must ensure that the predictor variables are not highly correlated with one another, as this would cause

problems with estimation. Leech et al. also suggest that researchers use large sample sizes, specifically 400 participants or higher, in logistic regression to provide sufficient numbers in both categories of the response variable. Logistic regression uses the independent variables under investigation to estimate the likelihood of occurrence of one of the categories of the dependent variable (Sweet & Grace-Martin, 2008).   Logistic regression also allows independent variables to be categorical or continuous.   The categorical option was also selected in the logistic regression analysis and gender and race were identified as categorical variables.

In this study, the likelihood that each participant will become a high school dropout based on the independent variables used in the current research model was investigated.

When deciding which method to chose for entering the predictor variables into the logistic regression model, Meyers, Gamst, and Guarino (2006) suggest selecting the method that best suits what stage the researcher is at with his or her research. They recommend that if the researcher is testing the hypothesis that the independent variables taken together will predict the dependent variable, then the researcher should use the "Enter" method. Otherwise, if the researcher is looking to find variables that he/she can test as predictors in a subsequent study or hold-out sample, then they recommend using the "Forward/Backward" method. The enter method will be used to test whether the predictor variables together predict high school drop out status.

Finally, model fit was assessed, with model discrimination obtained through the classification table, model calibration through the Hosmer-Lemeshow goodness-of-fit chi-square. The model is considered to fit the data well when the Hosmer-Lemeshow test

is nonsignificant. Nagelkere R^2 used to explain the proportion of variation accounted for by the model. Further, in examining the association between the independent variables and the dependent variable and testing the research hypotheses, the Wald statistic was used and the odds ratio for each predictor valuable was examined.

The software package PASW 18 was used to execute all of the analyses identified in the research procedure.

Results

As indicated earlier, a Pearson's Correlation Coefficient matrix was generated to identify any colinearity among the predictor variables. The results are displayed in Table 1. From the correlation table, it can be determined that several correlations among the independent variables are significant at the $p < .05$ and $p < .01$ levels but this is to be expected due to the large sample size. Norusis (2008) cautions researchers to always look at the magnitude of the correlation coefficient as well as the observed significance level. Particularly for large sample sizes, even very small correlation coefficients will tend to have small observed significance levels. Statistically significant does not mean important or useful, therefore, only correlations of .70 or higher that are also statistically significant were determined to indicate multicolinearity.

Based on the above mentioned guidelines, it was determined that the classroom work habits variable is highly correlated with the interpersonal skills variable ($r = .79$) and hyperactive/inattention variable ($r = .72$), and that the interpersonal skills variable is highly correlated with the hyperactive/inattention variable ($r = .70$) and social skills variable ($r = .72$). As a result, the work habits variable and the interpersonal skills variable were removed from the list of predictor variables to be included in the logistic regression analysis. The work habits scale was removed instead of the hyperactive/inattention scale based on the variety of questions included in each scale. The work habits scale included only five basic behaviours that could be highly subjective when rated by an observer, such as the child's teacher. The hyperactive/inattentive scale offered more variety in behaviours related to issues such as attention, distractibility, and cooperation. Based on the literature previously reviewed, the hyperactive/inattention

scale included items more closely related to early predictors of high school dropout, therefore, this scale was included in the analysis instead of the work habits scale.

The descriptive statistics and frequencies for the independent and dependent variables are represented in Table 2 and Table 3, respectively. The sample, $N = 1138$, had 32.4% of children aged 8, 32.4% of children aged 9, and 35.1% of children aged 10 (M $=9.03$, $SD = .82$). The gender composition for the sample was 46.9% male and 53.1% female, and the racial composition was 94.9% White and 5.1% non-White. In addition, the average income of the sample represented a total family income of more than $30,000 annually after taxes and deductions, and the mean level of socioeconomic status for the sample was medium (see Appendix D) with values ranging from -2.12 to 2.98 ($M =$ 0.14).

From the sample of 1,138 students included in the analyses, 146 did not complete the requirements for a high school diploma and were not enrolled in high school at the time of the NLSCY survey, indicating a dropout rate of 12.8% for this sample. Results from the logistic regression analysis are displayed in Table 4. A single block entry logistic regression was performed with high school dropout as the dependent variable and age, gender, socioeconomic status, income, race, emotional characteristics, academic achievement, hyperactive/inattention characteristics, aggression, social skills, parental support, parental involvement, teacher expectations, teacher experience, teacher efficacy, and class size as predictor variables.

The model appeared to fit the data well, with a Hosmer-Lemeshow Chi-square= 8.96, df = 8, p = 0.34. Model discrimination revealed that an estimated 90.1% of all students were correctly classified based upon their high school completion status.

Table 1

Pearson's Correlation Coefficient Matrix for Continuous Independent Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Income	--	.58**	-.13**	-.19**	-.18**	.12**	.19**	-.18**	.19**	-.20**	.23**	.04	.24**
2. Socioeconomic status		--	-.10**	-.20**	-.19**	.13**	.22**	-.27**	.23**	-.19**	.27**	.17	.32**
3. Emotional characteristics			--	.47**	.40**	-.27**	-.49**	.24**	-.34**	.37**	-.19**	.03	-.20**
4. Hyperactive/inattention				--	.65**	-.53**	**-.70****	.50**	**-.72****	.54**	-.38**	.02	-.39**
5. Aggression					--	-.60**	-.67**	.30**	-.52**	.50**	-.32**	.01	-.30**
6. Social skills						--	-.49**	**-.72****	.60**	-.42**	.32**	.05	.31**
7. Interpersonal skills							--	-.50**	**.79****	-.54**	.41**	.03	.39**
8. Academic achievement								--	-.62**	.40**	.39**	.03	.58**
9. Classroom work habits									--	-.61**	.44**	.05	.45**
10. Parental support										--	.46**	-.04	-.38**
11. Parental involvement											--	.05	.40**
12. Teacher efficacy												--	.02
13. Teacher expectations													--

Note: ** Correlation is significant at *p* < .01.
    * Correlation is significant at *p* < .05.

Table 2

Means, Standard Deviations, Minimum and Maximum values for the Independent Variables

	M	*SD*	Minimum	Maximum
Socioeconomic status	.01	.71	-2.12	2.98
Age	9.03	.82	8	10
Emotional characteristics	9.36	2.66	7	21
Hyperactive/inattention	18.47	4.31	11	33
Aggression**	13.94	3.46	11	33
Social skills	17	3.77	9	27
Interpersonal skills	29	4.16	7	35
Academic achievement	7.20	3.45	3	15
Classroom work habits	20.61	3.64	5	25
Parental support	8.26	2.66	6	30
Parental involvement	5.50	.88	2	6
Teacher expectations	4.92	1.32	1	6
Teacher efficacy	20.57	2.26	5	25
Teaching experience in years	18.56	9.35	*	*
Class size	25	4.73	*	*

Note: * Indicates values have been removed by the Statistics Canada Research Data Centre due to possible risk of disclosure.
Note: The difference between the least and most year teaching is 38.58 years and the difference between the least and highest class sizes is 39 students.
**direct and indirect aggression combined

Table 3

Frequency Distributions for all Categorical Variables.

	N	Percent
High school dropout		
No	992	87.2
Yes	146	12.8
Gender		
Female	604	53.1
Male	534	46.9
Household income		
Less than 10,000	61	5.4
10,000 to 14,999	44	3.9
15,000 to 19,999	136	12.0
20,000 to 29,999	158	13.9
30,000 and up	739	64.9
Race		
White	1080	94.9
Non White	58	5.1

Table 4

Logistic Regression Involving All Independent Variables as Predictors of High School Dropout in order of Significance

	B	S.E.	Wald x^2	Sig.	Exp(B)	95% C.I. for Exp(B)	
						Lower	Upper
Socioeconomic status	-1.28	.26	24.40	.00[*]	.28	.16	.46
Gender (1)	.53	.24	4.92	.02[**]	1.71	1.06	2.74
Hyperactive/inattention	.09	.04	5.01	.02[**]	1.09	1.01	1.18
Parental support	.10	.05	4.07	.04[**]	1.11	1.00	1.22
Teacher expectations	-.17	.10	3.05	.08	.84	.69	1.02
Academic achievement	.06	.04	1.70	.14	1.06	.97	1.16
Teaching experience	.01	.01	1.03	.30	1.01	.98	1.03
Age	.14	.14	1.03	.31	1.15	.87	1.51
Parental involvement	.10	.13	.63	.42	1.11	.85	1.43
Teacher efficacy	-.02	.05	.21	.64	.97	.88	1.07
Race (1)	-.19	.52	.13	.71	.82	.29	2.31
Aggression	.01	.04	.13	.72	1.01	.93	1.10
Emotional characteristics	.01	.05	.08	.77	1.01	.92	1.10
Income	.02	.10	.03	.84	1.02	.82	1.25
Social skills	.00	.04	.01	.94	1.00	.92	1.09
Class size	.01	.02	.00	.95	1.00	.95	1.04

Note: *The result is significant at the 0.01 level
     ** The result is significant at the 0.05 level
Note: All *df* = 1.

Specifically, of the students who completed high school, 98.9% were correctly predicted by the model and, similarly, of the students who dropped out of high school 15.3% were correctly predicted by the model. This shows that prediction was better for those individuals that did not drop out of high school than for those who did drop out of high school indicating that this was a weak model for the purpose of this study. Nagelkerke R^2 was 0.25 indicating that 25% of the variance in high school dropout is accounted for by the predictor variables in the model.

Table 4 provides the logistic regressions coefficients (B), Wald statistic and odds ratio for each of the predictor variables. Results from this regression analysis revealed that only socioeconomic status [x^2 (1, N = 1,138) = 24.40, p < .05], gender [x^2 (1, N = 1,138) = 4.92, p < 0.05], characteristics of hyperactivity and inattention [x^2 (1, N = 1,138) = 5.01, p < .05], and parental support [x^2 (1, N = 1,138) = 4.07, p < 0.05], could significantly predict high school dropout. More specifically, the odds of dropping out of high school were 1.71 times higher for males compared to females. A student's odds of dropping out of high school increased by 1.09 times with each one unit increase on the hyperactive and inattention scale. Lastly, the odds of a student dropping out of high school are increased by 1.11 times with each one-unit decrease on the parental support scale.

Discussion

Potential early childhood predictors of high school dropout were the focus of this study. Specifically, student factors which includes background characteristics (gender, race, socioeconomic status, and family income), and student's personal characteristics (emotions, behaviours, social skills, academic achievement, and classroom work habits), along with parental factors (parental support and involvement) and teacher and school related factors (teacher's expectations of students, teacher efficacy, along with teacher experience and class size) were investigated as predictors of high school dropout. These factors touch on each system of Brofenbrenner's (1979) ecological theory of child development, which was the theoretical framework for the study.

This investigation uncovered socioeconomic status, gender, hyperactive and inattentive behaviours, as well as parental support as potential predictors of high school dropout.

After discussing the high school dropout rate observed in the study, the proceeding sections discuss the results of the study within the context of theory and literature. Within the various sections, implications for education practice will also be highlighted as well as limitations to the current study and future research directions.

High School Dropout Rate

The first item of importance to discuss is how many of the students in the sample actually left high school before completing their diploma. The results revealed that the dropout rate for this sample was 12.8%, which is similar to the Ontario average previously reported at 10% (Mang, 2008). This finding is not overly surprising as the drop out rate across Canada has remained relatively stable over the last 2 decades,

fluctuating between 16% and 9% since 1990 (Bowlby, 2008; Gilmore, 2010). The finding is of key importance as it demonstrates that little ground has been gained in reducing the dropout rate for high school students. This does, however, support the notion that prevention and intervention efforts aimed at reducing the dropout rate are not as successful as they should be.

Background Characteristics

Based on Brofenbrenner's (1979) theory, the current investigation hypothesized that the background characteristics of the child, such as gender, race, SES, and income, would influence whether or not the student completed high school. The findings indicate that out of the four background characteristics investigated, only gender and socioeconomic status predicted high school dropout.

More specifically, the results indicate that if the student is male, their odds of dropping out increase. This finding is not surprising. As indicated previously, males continue to be at a higher risk of dropping out of high school than females (Ensminger & Slusarcick, 1992; Janosz et al., 1997; Jimerson et al., 2000; Newcomb et al., 2002; Richmond & Miles, 2004; Véronneau et al., 2008; Vitaro et al., 2005). From this information, it could be suggested that males are at a higher risk of dropout for several reasons. First, males have been documented to be more aggressive than females (Farmer et al., 2003; Lunenburg, 1999), which could put them at a higher risk for disciplinary action from the school system, which, in turn, could lead to higher rates of absenteeism and a sense of rejection from the school system, thereby causing males to give up and stop attending school altogether. Or, it could be suggested that males have more academic difficulties than females (Englund et al., 2008; Ensminger & Sluarcick, 1992;

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Richmond & Miles, 2004), and thus are unable to complete the academic requirements of high school or dropout due to a consistent record of failure in their classes.

The results further suggest that as student's scores on socioeconomic status decreased, their odds of dropping out increase (Table 4). More specifically, children from low socioeconomic backgrounds are at a higher risk of dropping out when compared to children from higher socioeconomic status backgrounds. This indicates that SES is a significant predictor of high school dropout as young as age 8. This finding is also not surprising as it is consistent with recent research into childhood predictors of high school dropout (Jimerson et al., 2000; Newcomb et al., 2002; Véronneau et al., 2008; Vitaro et al., 2005).

Personal Characteristics

Continuing with Brofenbrenner's (1979) theory, it was hypothesized that the personal characteristics and behaviours of the child, namely, their emotional characteristics, aggression related characteristics, hyperactive and inattention characteristics, social skills, and academic performance, would influence whether or not the student completed high school. The findings from the current investigation indicate that out of the five personal characteristics investigated, only the behaviours associated with hyperactivity and inattention predicted high school dropout. Specifically, the results showed that as students' scores on measures of hyperactivity, distractibility and inattention increase so do their odds of dropping out of high school.

This particular finding is of importance due to the lack of current research exploring the link between Attention Deficit Hyperactivity Disorder (ADHD) type behaviours in elementary school and later high school success (Du Paul et al., 2004;

Vitaro et al., 2005). It is not surprising that students who display behaviours associated with ADHD have academic difficulties. As these students have difficulty following directions, paying attention and are easily distracted, then it is understandable that they may have difficulty achieving academically and socially. When students are unable to keep focus and pay attention to important information, they will most likely struggle through tests and possibly be subjected to continuous teacher or school related discipline as their behaviours may be confused with deliberate disobedience or lack of respect. What is surprising is the age at which these behaviours can predict high school dropout. This indicates that behaviours such as distractibility, fidgeting, impulsivity, inability to stay on task put students at risk and need to be targeted for earlier intervention in order to successfully reduce the high school dropout rate for this unique population of students.

Parental Influences

Parental involvement and support were also hypothesized as potentially contributing to their child's high school completion status through Brofenbrenner's (1979) theory, and their influence was partially substantiated in this investigation. The findings indicate that the less involved the student's parents are in his/her schooling efforts, the more likely the student is to drop out of high school.

This finding is also worth highlighting as the parental support items included in this analysis involved school specific support for the child's academic success. The questions included in the parental support variable were all related to how much support the parent(s) or guardian(s) were providing to the child's schooling efforts, which is consistent with current research (Entwisle, Alexander, & Olson, 2004; Rumberger et al., 1990). However, the area of parental support examined in this study is directly related to

how much the parents are nurturing their child's success at school.

It is not surprising that parental support and socioeconomic status were both significant predictors of high school dropout as the items included in the parental support variable reflected items that could be influenced by SES, such as whether or not the student was properly dressed for school, whether or not the child had the necessary school materials for class, and whether or not the child had proper nourishment. Although these two variables did not meet the threshold for colinearity in this study, it is important to recognize how one variable may be influencing the other in predicting high school dropout. This finding indicates that social and financial inequalities are continuing to impact a student's school success, suggesting that teachers may need to find alternative methods of interacting with, and gaining support from a student's parents in order to foster dialogue and promote parental support for student success.

Summary

Contrary to the research reviewed, income, aggression, academic achievement, poor social skills, negative emotional characteristics, and teacher and school related factors did not predict high school dropout. This indicates that some variables previously thought to contribute to high school dropout at an early age were not significant for this population of students. This could be the result of many factors. One such factor could be that the information relating to most of these variables came only from the student's teacher. As a result, the risk of the data not representing the most accurate picture of each child's psychosocial and familial make-up is increased. This is not to say that these findings should be disregarded, but lends to the idea that further research should be gathered using multiple sources of information to ensure that the personal characteristics

of the child are captured accurately in every situation by all key stakeholders involved in the child's upbringing.

Nevertheless, the outcome of this study lends way to numerous suggestions and potential advancements in the areas of prevention and intervention among elementary school students who display characteristics associated with predictors of high school dropout. The results of this study suggest that there are several childhood predictors of high school dropout that need to be targeted in prevention efforts going forward to ensure that students are receiving the proper support for their educational development. Most important, the findings reiterate that prevention programs, such as early learning strategies, must target and treat the whole child and further enforces the need for parents to be involved in their children's educational development (Crusto et al., 2003; Duchesne et al., 2008; Entwisle et al., 2004; Foster, Tilleczek, Hein, & Lewko, 1993; Rumberger, 1987). In the best interests of students, schools and policymakers alike need to gain substantial ground on bridging the gap between home environments and school environments, as well as enhance their efforts directed towards counteracting the influence of gender and socioeconomic status.

Limitations

One limitation of this study was that the reported analyses were based on unweighted data. According to Statistics Canada (1998), The principle behind estimation in a probability sample such as the NLSCY is that each person in the sample "represents," besides himself or herself, several other persons not in the sample. For example, each child in the NLSCY sample represents about 300 children in the population" (p. 39).

Because the NLSCY is based upon "a complex sample design, with stratification, multiple stages of selection, and unequal probabilities of selection of respondents, there could exist potential for the data collected to be bias" (Statistics Canada, 1998, p.119). As a result, in order for survey estimates and analyses to be free from bias, survey weights must be applied.

The NLSCY offers three different sets of weights for each cycle, two longitudinal (funnel and nonfunnel) and one cross-sectional (Statistics Canada, 2008). "Funnel weights are assigned to longitudinal children who have responded at every cycle, while non-funnel weights are assigned to longitudinal children who responded at the most recent cycle, but not necessarily at all previous cycles" (Statistics Canada, 2008, p. 33). When making inferences about a population that was surveyed, Statistics Canada recommends that the survey weights be used. Because of the complex sample design, the distribution of a characteristic of interest in the sample is probably different from its distribution in the population. Only by applying the survey weights can the population's distribution be preserved (Statistics Canada, 2008). The appropriate weight for use in this study was the funnel weight for cycle 7. The limitation of reporting data without the weights applied is the implication on the external validity of the study. Subsequently, while this study points to important potential predictors of high school dropout, it remains important to determine if any of the identified predictors will remain significant in predicting high school dropout after the weights have been applied.

Another limitation revolves around the fact that high school dropout can occur for a variety of reasons, which can be voluntary or involuntary. Notwithstanding, the current investigation does not differentiate between students who left high school before

graduating as a result of their own choosing (drop out) or as a result of a disciplinary action that may have been imposed on them (kicked out).   As a result, the findings should be interpreted with this in mind, particularly when discussing implications for educational practice.

Internal Validity

Threats to the internal validity of a study indicate that other factors are contributing to the observed differences in the dependent variable and not solely the independent variables under investigation (Fraenkel & Wallen, 2009).   One potential threat to the internal validity of this study is data collector bias. As mentioned earlier, most of the information used in the study design was obtained from teachers who reported on their own behaviours as well as those of their students and the students' parents. Subsequently, the teachers may have randomly missed, minimized, or maximized the severity of any of the behaviours they reported on. For example, teachers may not want to paint a student in a negative light. They may downplay the behaviours of children and dismiss any extreme behaviours as unusual and not the norm for that particular child.

Additionally, the current research study did not conduct Exploratory Factor Analysis which could have weakened the validity of the scales used in the analysis. Finally, there exist several nonsampling errors in the NLSCY, such as response errors due to sensitive questions, poor memory, translated questionnaires, and approximate answers (Statistics Canada, 2010).

Implications

Children's success or failure in school does not occur within a neatly defined set

of parameters but can be explained as occurring within interacting environments. Bronfenbrenner's (1979) research and theory has helped focus our attention to the larger frameworks of children's lives. He emphasizes the need to examine that systems at work beyond the individual and urges us to explore the settings, such as home environments and school environments (microsystems) in which children are directly implicated, and urges researchers to study the relationships between these key settings in which children are located (Tan & Goldberg, 2009). Ensuring that children not only stay in school but also strive to meet and exceed our pre-described academic standards as well as fully realize their own academic and personal potential are high priorities for parents, educators, and governments alike. Research is consistently demonstrating the impact that parents have on their children's educational outcomes (Englund et al., 2008; Entwisle et al., 2004; Hill & Taylor 2004; Jimerson et al., 2000; Oyserman, et al., 2007; Rumberger et al., 1990; Tan & Goldberg 2009).

Although the Ontario Ministry of Education has recently developed parental incentive programs for parents who engage in their children's educational organization, the programs have several limitations. Specifically, it appears as though the terms and conditions associated with applying and qualifying for such incentives are designed more for the parents who are already involved in their child's schooling and do not necessarily target the parents who are largely absent from the school picture. More precisely, most of the incentives apply to parents who work together in groups on educational projects for their children's school (Ontario Ministry of Education, 2011). In addition, the terms and conditions that accompany these incentives require that parents apply for and pay for the cost of insurance to run any school-associated programs or fundraisers, as well as keep

meticulous financial records and submit a dissemination of their project goals and outcomes (Ontario Ministry of Education, 2011). These strict guidelines are well founded and serve to reward those parents that do participate in the school, but miss the purpose of recruiting new parents to become involved in their student's educational activities.

McCain and Mustard (2002) have explicitly outlined the need for early education among children as young as infants, as well as the implications that promoting children's health and developments have on the success of the country in their Early Years Study. McCain and Mustard analyzed data gathered by the NLSCY from 1994 to 1998 and found that approximately 212,000 out of 900,000 children from the ages of 0 to 6 in Ontario were at risk for not reaching their full potential when they entered the school system. The authors described these 212,000 children as "on a life course trajectory that could lead to learning, behaviour and health problems later in their life" (McCain & Mustard, 2002, p. 17).

The key aspect to McCain and Mustard's (2002) research is that they are not describing children from extremely low-income families with no stable parents or guardians. They found that the majority of the children who were at risk for negative developmental trajectories were from two-parent, middle income families, indicating that factors, such as income, academic achievement, and socioeconomic status, are not the whole picture when discussing where efforts and funding need to be targeted. Therefore, the findings from this research study bring to the discussion the possibility of adding new topics on the policymakers' agenda for student success, specifically, improving support services for students with attention and hyperactive difficulties as well as enhancing the current prevention and intervention efforts at the elementary level.

High school graduation is by no means the whole picture. Life beyond high school graduation has societal and personal impacts. Future research and the programs that will develop from research studies such as this truly emphasize the need to prioritize student discrepancies in socioeconomic status, gender, and hyperactive and inattentive behaviours, at the same level as academic achievement improvement, in order to ensure that each individual will be successful beyond the educational organization.

Future Research

This study offers the opportunity for future researchers to expand on the ideas investigated in an effort to help narrow down specific prevention programs and stable early predictors of high school dropout. Some of the key areas that require further attention would include evaluating the efficacy of current prevention and intervention efforts in conjunction with examining the persistent characteristics that help children to be resilient in the face of negative influences. Particularly, those characteristics that pose the greatest risk for permanent negative development. It would be of significant interest to identify the interactions among possible predictors of high school dropout to examine whether or not the predictors identified in this study are influencing the child's development alone or as a result of other compounding influences. In addition, it would be important to further examine how the predictors of high school dropout vary (increase or decrease) throughout the child's development. Such a task could be addressed by examining variables at multiple time points throughout the child's lifespan; for instance, examining the influence of each predictor at each school year from kindergarten to grade 12. By examining the impact of variables at multiple time points, researchers and policymakers would be able to target prevention and intervention programs at the

appropriate developmental periods and for the most persistent negative influences that contribute to high school dropout.

Conclusions

This study identified socioeconomic status, hyperactive and inattentive-related behaviours, and parental support as potential predictors of high school dropout in a cohort of elementary students. Of key importance for this discussion, and for future research, is the fact that identification of students who are placed at-risk by these factors and subsequent intervention efforts need to remain a key focus at the elementary school level. Therefore, this study echoes the suggestions of Newcomb et al., (2002), that the likelihood of dropout intervention efforts being successful when a student is already in high school may be slim. By the time an at-risk student reaches high school, they have most likely already had numerous negative experiences within the educational organization related to their academic and personal struggles, making intervention efforts reactive as opposed to proactive.

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