THE SCHOOL AS A SETTING TO PROMOTE STUDENT HEALTH AND WELLBEING

by

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ABSTRACT

The Health Promoting School (HPS) is a model that advances both the health and learning needs of students. Yet there is a lack of consensus on student indicators that reflect a HPS or a coherent understanding of what a HPS represents amongst various stakeholders. The goal of this research was to establish indicators of student health and wellbeing associated with policies and practices in schools, and to further our understanding of health promoting schools. The research proceeded in three phases. The first phase established a relationship between student health and academic achievement. The second phase examined the associations amongst student health and wellbeing and student and school-level factors. The third phase involved case studies of two schools in Ontario to examine the organisational and structural elements associated with achieving a HPS, and the mechanisms by which these elements support student health and wellbeing.

The association between students’ self-rated health and their academic achievement found in the first phase provides a platform for advancing the health promoting school agenda in Canada at the research and policy levels. Subsequent findings established an association between the environment and disciplinary climate in schools, and the school’s academic and socioeconomic standing to student health and wellbeing outcomes. These findings also suggest overlapping effects of schools and neighbourhoods on students’ health and wellbeing, implying that school health promoting efforts will be more successful when partnered with efforts within neighbourhoods and communities. Finally, the case studies suggest that embracing a HPS philosophy that addresses students’ emotional and physical wellbeing may help support students’ overall learning. Findings, presented in an implementation model of a HPS, emphasise key action areas that need to be addressed when implementing HPS initiatives and enhancing the capability of the education system to improve the health and learning of students.
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CHAPTER I: INTRODUCTION AND THEORETICAL FRAMEWORK

There is increasing interest in promoting health through schools. In 2004, Ontario’s Ministry of Education introduced a new school health program with the intent of “making Ontario schools healthier places to learn” (Kennedy, October 20\textsuperscript{th}, 2004). At the national level, a Pan-Canadian Joint Consortium on School Health has been initiated by health and education deputy ministers across Canada. Their first symposium, “The Communities and Schools for Health,” was held in November, 2004. These recent provincial and national efforts are an acknowledgement of the synergy between health and learning, and reflect the recognition of schools as social systems that have the potential for enhancing the health and wellbeing of students. Such efforts require a reorganisation of the way we think of schools from settings where health education is delivered to creating settings that are conducive to health (World Health Organization [WHO], 1996a).

Conceptions of schools as settings for health emerged in countries and continents under different labels (WHO, 1996a). It has become known as the Health Promoting School (HPS)\textsuperscript{1} in Europe and parts of Asia and Australia, while in the US and Canada, there has been a preference for Comprehensive School Health (Ronson & MacDougall, 2004). A more recent label, The Living School, has also appeared in Ontario (Shain, 2005). Regardless of the titles attached to these initiatives, there is an underlying acknowledgement of the social and environmental conditions where people live, grow, and work (WHO, 1996a). The term HPS is used throughout this document to refer to

\textsuperscript{1} To distinguish the use of the acronym, Health Promoting Schools (HPS) will refer to its use in the plural form, while the/a Health Promoting School (HPS) will refer to its use in the singular form.
schools as settings for health, since the bulk of the research literature referred to in my research uses this term.

The evolution of thinking and conceptualisation of the role of schools in promoting the health of their students has yet to be supported by research and evaluation frameworks that could capture the inherent theoretical dimensions. Despite a growing interest in HPS, there are few studies that explore the manner by which schools influence student health compared with the volume of research on school effects on educational outcomes (West, Sweeting, & Leyland, 2004). While the theoretical frameworks guiding the health promoting school principles are rooted in a comprehensive settings approach, in practice, initiatives have largely been restricted to smaller scale interventions (Dooris, 2004).

This chapter is structured in four major sections. The first section presents a brief historical overview that describes the development of health education and promotion, and the conditions that led to schools as settings for health promotion. Next, a literature review presents the conceptualisation of schools as settings for the promotion of health. An overview of existing research approaches is presented, in addition to the conceptual and methodological issues that emerge from the literature about the research and evaluation of HPS. In the third section, a theoretical framework that I have developed to inform my research is presented and discussed. Finally, the fourth section introduces the three manuscripts that constitute the research and the contribution of each to research around HPS.
Health Education and Health Promotion

Earlier forms of health promotion were defined by a medical model of health education (HE). This model was didactic in nature and focused on the transmission of knowledge with the aim of influencing personal lifestyles and changing health behaviours at the individual level. Health education was used as a strategy to address specific health problems such as tobacco and substance use, sexual health, or cardiovascular disease risk factors, generally through physical or health education curricula (Lynagh, Schofield, & Sanson-Fisher, 1997). The assumption underpinning HE models was that change in one’s knowledge about a subject area would lead to change in attitudes and in turn change in behaviours. However, it became clear that this assumption, whereby provision of information would lead to behaviour change, was seriously flawed (St. Leger, 2006). Conventional HE programs were rooted in the behavioural sciences and their proposed interventions, designed by psychologists, emphasised the role of personal habits and lifestyle as a cause of ill-health. Even when strategies were improved to incorporate theories of social influence, evidence consistently demonstrated that health education had minimal effect on the health behaviours of young people beyond the short term (Colquhoun, 1991). The goal of these models was to arm young people with the skills to resist peer pressure for engaging in risky behaviours, yet their results proved to be disappointing (Peterson, Kealey, & Mann, 2000).

Health education (HE) was criticised for being reductionist by placing the responsibility for health solely on the individual. This approach is now viewed as politically naïve, placing undue emphasis on disease rather than on a broad understanding of health (Kemm, 2003; Tones, 2005). Critics proposed that prevention strategies should
target the physical and social environments within which individuals exist (McLeroy, Bibeau, Steckler, & Glanz, 1988; Stokols, 1992) and pointed out that HE strategies failed to ameliorate the existing health inequalities among young people resulting from their socio-economic status, their gender, and their ethnic affiliation (Whitty, Aggleton, Gamarnikow, & Tyrer, 1998). The resolution to these concerns was seen in a shift from an individual to a collective responsibility in the understanding of health, and a change in health education and health promotion and their focus on lifestyle to address social and environmental problems (Tones, 2001).

The Ottawa Charter for Health Promotion has been credited with reshaping school health across the world by embracing a more holistic approach. Health and education sectors were encouraged to develop the health attributes of students in a positive way rather than focusing on morbidity (St. Leger, 2000). The impetus for a settings approach to health presented by the Ottawa Charter (1986) was predicated on five key strategies: (a) establishing healthy public policy, (b) creating supportive environments, (c) strengthening community action, (d) developing personal skills, and (e) reorienting health services. Such an approach to health promotion represents an ecological perspective that is grounded in a contextual oriented view of human health and wellbeing (Stokols, 1992).

Models and frameworks are useful in “articulating theory and in developing understanding,” yet it is “important to recognise that they do not always equate with practice” (Dooris, 2004, p. 43). The HPS is no exception, and research documenting the association of school processes to outcomes is scarce (Thurston, 2006). Moreover, the approach has a poorly developed evidence base stemming from difficulties in both implementation and evaluation (Dooris, 2005). The next section addresses the conceptual
and methodological issues associated with the research related to HPS frameworks and practice.

Literature Review

The School as a Setting for Health Promotion

The recognition of schools as one of the settings that shapes student health requires a shift in how health promotion is done from an individual level intervention to a whole school change program that includes individual and institutional components (Bond et al., 2004).

Schools that aspire to be a HPS are required to adopt a set of guidelines developed by the WHO (1996a) that include establishing school health policies, developing programs that promote health, extending the teaching beyond health knowledge and skills to take account of the school’s social and physical environment, and creating links with community and partner organisations.

The theoretical underpinnings of the HPS lie within Bronfenbrenner’s social ecological model (1986, 1989) where human development is viewed as being affected by multiple levels of influence, including the microsystem, the mesosystem, the exosystem, and the macrosystem. The microsystem is the informal social network of family and peers; the mesosystem represents the resources and supports that build organisational capacity; the exosystem consists of the community partnerships and relationships among organisations and groups; and the macrosystem encompasses regulatory public policies, procedures, and laws. Similarly, the HPS recognises health as the product of a multitude of interconnected and interacting physical, social, and psychological factors with the purpose of creating “a total context that is conducive to health and where not only the
physical environment but the ethos and relationships provide a climate conducive to positive health and wellbeing” (Weare, 2001, p. 9). Further, the school environment is considered to include structural issues, organisational practices, and school factors that include the school health curriculum, the teaching of this curriculum to students, the physical and social factors within the school, and the relationships among the school, the community, and external agencies.

**Conceptualisation of Health Promoting School Initiatives**

Despite a consensus on the elements of a HPS, there is inconsistency about what it represents. Some view the HPS as an outcome; for others, it is an approach or a set of values. Several practitioners have a more pragmatic perspective and think of a HPS as specific programs or interventions intended to address a problem or a set of problems (St. Leger, Kolbe, Lee, McCall, & Young, 2007), resulting in a fragmentation of approaches and an emergence of a plethora of labels that are used to describe schools. To cite just a few, Active Schools are designed to increase physical activity; Drug-free schools are designed to prevent drug and substance use; Safe-schools are designed to prevent physical and psychological harm such as bullying (St. Leger et al., 2007). Clearly, adopting one perspective over another has different implications for how schools are organised, how priorities are determined, and what are considered as measures of success.

Currently, there is little agreement on how the HPS works in practice or in the ability of schools to operationalise such an approach (Deschesnes, Martin, & Hill, 2003). Similar to the challenges faced in the social sciences (Coe, 2004), the definition of programs in HPS initiatives are generally not clear, and programs assumed to be similar
may be quite different. We require a coherent perspective that views these fragmented initiatives as smaller components in a larger model to advance student health, wellbeing, and educational achievement.

Areas of overlap between education and health are present and need to guide research and evaluation in school health promotion and the manner by which findings generate policy improvements that are useful to practitioners in the health and education sectors. Research on effective schools has shaped schools and their educational practices but has been overlooked by a health sector that has developed its own approaches to addressing the health of young people (St. Leger et al., 2007). In reality, initiatives directed by the health sector fail to embrace the philosophy that underlies HPS, which recognises that longer-term health improvements will only ensue if initiatives are integrated into a broader, multi-faceted health promotion strategy. Such a strategy would support sustained change and move “beyond the individual to encompass the school environment, structural issues and organisational practice” (Inchley, Muldoon, & Currie, 2007, p. 66). Schools are considered by the health sector to be cost-effective sites for health promotion interventions. Yet, the effectiveness and sustainability of school health initiatives are governed by how closely they are linked to the primary business of the schools (International Union for Health Promotion and Education (IUHPE), 2000), namely academic achievement.

The intersection and overlap between health and educational goals have been demonstrated in recent studies. For example, a positive school climate and school support are associated with positive emotional health among Canadian youth (Freeman, Klinger, Wintermute, & Boyce, 2003). Furthermore, interventions that improve student school
attendance, school belonging, and involvement in school have been shown to reduce engagement in risk behaviours such as smoking and drinking (Anderman, 2002; Blum, McNeely, & Rinehart, 2002; Patton et al., 2006; West, Sweeting, & Leyland, 2004). Similarly, Lee, Cheng, and St. Leger (2006a) showed that attending schools recognised as HPS resulted in improved student life satisfaction, emotional status, self-reported health, and academic performance, as well as a reduction in health-risk behaviours. In exploring the implementation of the HPS in 15 schools in Sweden, Nillson (2004) concluded that the activities inherent to HPS could well be classified as whole school development practices that target educational improvement. These studies suggest that it may be more useful to address how schooling is conducted and its participatory and inclusionary practices rather than by simply adopting a specific health intervention to change. The intersection of health and educational goals in school policy documents and activities facilitates closer links between health initiatives and broader strategies of school improvement (The Healthier School Partnership Project, 1997).

**Measures of Success**

The Ottawa charter and social ecological models were fundamental to the emergence of HPS principles. Yet despite the shift from an individual to a settings approach to health, the effectiveness of health promotion efforts is still measured using behavioural change indicators such as increased knowledge, awareness, and skills (Koelen, Vaandrager, & Colomer, 2001). The general assumption has been that initiatives representing a HPS paradigm will lead to immediate, measurable health gains or to improvements in educational outcomes. Such an approach has led to a focus on specific, short-term interventions that produce visible change in students’ health-related
behaviours, and a tendency to focus on narrow outcomes of HPS initiatives, for example, the proportion of students who engage in risk behaviours. Moreover, HPS initiatives generally reflect local health needs and issues identified by students and staff at schools; therefore, using student outcomes as a measure of effectiveness would have to vary by school. In addition, “there are problems relating to the definition and measurement of outcomes and even when these are clear they are often poorly reported” (Australian Health Promoting Schools Association, 2003, p. 4). By exclusively emphasising behavioural outcomes, research fails to take into account contextual factors. Especially problematic is the exclusion of the characteristics that are representative of the school and local environments. St. Leger (1999) argues that the majority of health promotion interventions that occur in schools are unlikely to demonstrate substantive impact till a later time in life, implying that it is difficult to demonstrate substantial health gains when these interventions are assessed after brief periods of implementation. This limitation is compounded by impracticalities of obtaining physical and physiologic information from school children, such as blood sugar and blood pressure levels, that are considered valid measures in clinical health research. Moreover, it is “unrealistic to expect health interventions which are supported with limited and short-term funding to make much difference in behaviour change” (St. Leger et al., 2007, p. 110).

A continued emphasis on health behaviours as outcomes of HPS undermines the need to examine the mechanisms and processes of implementation that would be able to clarify, modify, and improve the established theoretical frameworks. Understandably, concrete measures are a priority for policy makers and funding agencies because they are easy to communicate and understand and are readily transferable to policy decisions. An
example would be increasing the requirements for quality daily physical activities in schools to target obesity. Demonstrating favourable changes in attitudes and behaviours is also an incentive for program personnel who use the evaluation as a persuasive or symbolic tool (Shulha & Cousins, 1997) to promote and legitimise the program to ensure continued funding.

The preoccupation with health behavioural outcomes as measures of a HPS has some researchers worried. Jensen and Simovska (2005) warn against the risk of dilution of valued outcomes that would reflect a broader health paradigm. The development of broad definitions of health has led to the questioning of health behaviours as the only valid outcomes of health promotion (St. Leger et al., 2007). The need to emphasise positive health rather than just illness is signaled in the WHO’s (1986) position statement that health is a positive concept, emphasising social and personal resources, as well as physical capabilities. Such an approach to health sees the promotion of mental, emotional, and social health as more than the treatment or even the prevention of illness. It is concerned with the promotion of positive wellness as the overall framework for health. Increasingly, developing mental health and wellbeing has become recognised as fundamental to conceptions of health and as essential resources for reaching one’s full potential (IUHPE, 2000; Trent & Herron, 1999). Accordingly, emotional and social indicators are being realised as key to positive human development and effective education (Lister-Sharp, Chapman, Stewart-Brown, & Sowden, 2000; St. Leger, 2000; Weare, 2007).

The need to examine the relationship between education and mental health has been highlighted by various researchers because of the close association between
emotional difficulties and students’ ability to learn, and the role of emotional difficulties in anxiety and conduct disorders that also compromise educational attainment (Adelman & Taylor, 1998; Needham, Crosnoe, & Muller, 2004). Moreover, there has been a call over the past decade for school reform efforts to incorporate affective outcomes in conjunction with academic outcomes (Fitz-Gibbon, 2006; Huebner & McCullough, 2000; Weare & Gray, 2003) because of the close links between psychological and emotional states and learning. Accordingly, student wellbeing outcomes have the potential of being used by both health and education sectors as indicators of both school and health promotion effectiveness.

The implication of this rhetoric for research on the effectiveness of HPS initiatives is the need to establish indicators of individual wellbeing that are congruent and compatible with the multi-dimensional elements of HPS. The central issue that needs to be explored is under what conditions young people’s wellbeing is maximised, and to what extent are schools able to contribute to the wellbeing agenda.

*Research Methodologies*

In a systematic review of interventions that address mental health, physical activity, and healthy eating in schools, Shepherd and colleagues (2002) emphasised the need for methodological research to establish effective ways for evaluating interventions in school settings. They proposed applying randomised controlled trials (RCT) to individuals, families, schools, geographical areas, or other units to conduct outcome evaluations. The majority of the studies that explored the effectiveness of HPS approaches in the U.S. and the U.K. have favoured an experimental approach using large-scale randomised controlled trials (RCT) or quasi-experimental designs across multiple
settings (Inchley, Currie, & Young, 2000). This trend is evident throughout the health promoting school literature (see Byrne, Barry, NicGabhainn, & Newell, 2005; Thomas, Ravens-Sieberer, Klapp, & Gille, 2005). For example, a recent synthesis of 32 studies to review the effectiveness of the health promoting schools approach between 1997 and 2006 conducted by the Health Evidence Network for the WHO (Stewart-Brown, 2006) only included studies that employed randomised controlled research or pre-and post-test designs that assessed the impact of health promotion in schools on some aspect of health and wellbeing, leading the author to suggest that the HPS approach “sits uncomfortably within the RCT paradigm” (p. 15). The review by Stewart-Brown (2006) also highlighted the fact that most of the studies focused on relatively short-term, classroom-based interventions to improve knowledge and skills, and these were shown to be the least effective. Moreover, none of the studies reported data on the contribution of other features of the health promoting schools approach, such as the school climate, active participation of school staff in such initiatives, or details of implementation.

The Gatehouse project, a recent and well recognised HPS initiative, is a primary prevention program designed to reduce the rates of substance use and promote the emotional and behavioural wellbeing among students in secondary schools in Australia (Bond et al., 2004). The project is an example of a whole school multilevel intervention that extends over three years and consists of the establishment of a school-based adolescent health team, the implementation of curriculum components and teaching resources, and ongoing professional development and support for teachers. The effectiveness of the intervention was assessed using a cluster randomised controlled design to allocate secondary school districts to intervention or control groups. Findings
pointed to modest differences for alcohol, smoking, and friend’s drug use between the intervention and control groups but no differences in emotional wellbeing across groups at the end of the three-year longitudinal design.

Despite the methodological rigour employed by the Gatehouse project team, researchers acknowledged the limitations inherent to their research methodology that failed to “capture the complexity of the whole school changes undertaken by the schools,” and the transformations at the system level that impacted a school’s culture and climate (Bond et al., p. 1003). Other conclusions drawn from the study were the need for a comprehensive conceptualisation of student wellbeing and a shift “from an individual service focus to a focus on organizational health” (p. 1002) and the people, processes, and support structures involved.

While these experimental approaches are well-established in clinical research, they have been criticised as being inadequate for examining the effectiveness of school initiatives for several reasons. First, when the unit of intervention is a community, or, in this case, a school, as opposed to individuals, experimental approaches to research ignore the important role that contexts play in shaping health (Kemm, 2006). Experimental designs assume that interventions are implemented consistently in many schools at the same time (Denman, 2002). Moreover, there is a belief that a health promotion strategy is as likely to succeed equally well in one school as another, and that success is attributed to the health promotion intervention itself rather than to the implementation process and allocation of funding (Rowling & Jeffreys, 2006). Furthermore, the long time it takes for change to materialise in educational settings makes it unethical to demand that schools in
the comparison group refrain from implementing health promoting activities (Mukoma & Flisher, 2004).

Schools are recognised as complex social systems. This complexity poses a challenge for finding control groups that take account of all the variables that could influence outcomes and in matching a rigorous design to realistic program circumstances such as the environmental and social contexts in which HPS initiatives take place. Given the multi-dimensional nature of the HPS, evaluation of program success poses many challenges (Mukoma & Flisher, 2004). To complicate matters further, there is a lack of agreement between education and health as to what is regarded as evidence, and the standards against which research methods would be scrutinised to ensure that evidence is considered up to standard (Kemm, 2006). Lee, Cheng, and St. Leger (2006b) argue that evaluation of HPS efforts should be more in line with the educational dynamics of schools and the research literature on effective schooling, rather than focusing primarily on health-related measures.

An avenue of research used to examine school effectiveness research views schooling as a multilevel or nested phenomenon in which the activities at one level are influenced by those at a higher level (Rumberger & Palardy, 2004). Because student-level variables are nested within the higher level school variables, analyses using multilevel research frameworks enable the separation of student and school effects on student outcomes (Raudenbush & Bryk, 2002). There are three aspects of this approach that need to be highlighted. First, it can account for the non-independence of observations within groups and control for the clustering-effects of lower-level units in higher-level units (Ma & Klinger, 2000). Second, the extent to which schools differ in their profiles can be
determined. Finally, the two potential sources of variability between schools, which are attributed to differences in structures and policy of schools on the one hand and differences in the intake of pupils on the other, can be estimated.

More recently, multilevel models have been used to examine the effect of school-level variables on school belonging, self-concept, depression, optimism, social rejection, school problems, and GPA (Anderman, 2002); smoking, alcohol consumption, dietary patterns, tooth brushing, physical activity, and medicine use (Maes & Lievens, 2003; West, Sweeting, & Leyland, 2004); and smoking uptake and cessation (Aveyard et al., 2005). These studies highlight the potential application of multilevel frameworks and methodological techniques in exploring health and wellbeing outcomes among students as part of HPS effectiveness research. Although multilevel analyses would provide ample empirical evidence, they need to be supplemented by in-depth qualitative studies that would expand on the relationships between the school contextual factors and student health outcomes identified in quantitative analyses and that would strengthen the conceptual frameworks developed (McNeill, Kreuter, & Subramanian, 2006).

**Evaluation of HPS Approaches**

While indicators that would reflect the HPS principles are needed, evaluation studies that employ multiple methods and that allow for the investigation of process as well as outcomes are also required to examine the effectiveness of HPS approaches and initiatives (Inchley, Currie, & Young, 2000; St. Leger, 2000). Although there is still considerable confusion about what should be evaluated in school health promotion programs (Inchley et al.), understanding implementation at a practical level has been recognised as essential for schools in the preliminary stages of their journey towards
becoming HPS. Rumberger and Palardy (2004) suggest that the research that holds the most promise for understanding and improving school performance is the exploration of how schools are organised and managed, the teaching practices in schools, school restructuring, and various policies and practices that affect the social and academic climate schools create for students. The same logic can be applied to understanding HPS initiatives when it becomes accepted that a HPS is a process in itself and not a preset outcome (Jensen & Simovska, 2002). The tools for evaluating the implementation of HPS initiatives can then identify the processes by which schools can be more effective as health promoting institutions, and the factors that influence this process (Tossavainen, Turunen, & Vertio, 2005).

Program planners, implementers, and other stakeholders have different ideas about how a certain program should work. Their ideas and theories have to be brought “to light” in order to reach an agreement on what deserves to be tested (Weiss, 1997). While theories can help explain a program, understanding how a program works involves developing an implementation theory that describes the different steps to be followed to execute a program; and a programmatic theory that identifies the “mechanisms that intervene between the delivery of program service and the occurrence of outcomes of interest” and where the “mechanism of change is not the program activities but the response that the activities generate” (Weiss, 2007, p. 73). Programmatic theories provide a conceptual summary and examine the causal mechanisms involved in programs and policies, which would allow for replication and improvement. Not only do they reflect logical reasoning and assumptions held by practitioners, but they also provide an
understanding of how program clients or intended beneficiaries understand the program (Rogers, 2007).

According to Weiss (1997), an interactive process is required in order to achieve successful theory-articulation. This process entails a combination of procedures that include observing the program in operation, discussions with people involved in the program, review of evaluations of similar programs, and logical reasoning, followed by discussions and modifications until stakeholders agree with the final formulation of programmatic theory that is credible and useful to them. Conducting case studies can obtain these linkages because they can provide a closer and deeper look at how a program is working and being implemented, highlighting ongoing challenges and barriers. The main value of case study research is in generating rich data from which explanations can be developed (Thurston, 2006). Moreover, case study research allows the triangulation of data from a variety of sources to enhance the validity of the findings (Inchley et al., 2000).

*Schools as Settings*

The settings approach to health promotion is based on a premise that there are relationships between the environmental resources available in a setting and the health and lifestyles of those occupying it, requiring the cooperation of individuals and groups acting at different levels to be successful (Dooris, 2005; Green & Kreuter, 1990; Stokols, 1992, 1996). Essentially, a healthy settings initiative has been developed to reflect a broad vision of wellbeing (Dooris, 2004). Such a vision regards health as encompassing physical, mental, and emotional wellbeing and social cohesion at organisational and community levels. Thus the “health promotive capacity of an environment must be
defined in terms of the multiple health outcomes resulting from people-environment transactions” and the key environmental resources or constraints that are likely to influence personal and collective wellbeing (Stokols, 1992, p. 19).

In many instances, the term “setting” is loosely used as a label to describe the backdrop of a health promotion initiative or as a physical construct to describe a place without taking into account the setting’s organisational features (Whitelaw et al., 2001). As a result, individualistic health education rather than health promotion continues to take place under the banner of settings.

Whitelaw and colleagues (2001) have outlined five typologies of how a settings approach has been applied to health promotion strategies. In the first, labelled the *passive model*, traditional educational activities take place in a setting seen as convenient and efficient to access a population, which is characteristic of early models of health education in schools. The *active model* is considered a variation of the former but is topic focused and accompanied by policies that target changes in the setting or environment; an example is the manner by which smoking is targeted through a smoking ban in public places. In the *vehicle model*, the emphasis is on establishing tangible projects as a vehicle for initiating organisational development and change. Creating exercise facilities to promote staff morale within an organisation is a good example of the vehicle model. The fourth level, the *organic model*, draws on the assumption that over-arching systems result from the product of multiple processes and individual action. The product in this case is not just the health gains espoused but the organisational changes and improved ethos or culture within the setting. Finally, despite the illusion of the *comprehensive model* being all-encompassing, it is confined to broad settings policies and strategies with the
emphasis on powerful levers within the system to precipitate change. Although this latter model might appear to undermine the role of individuals within a setting, its aim is to produce policies, legislative processes, and the required organisational and educational changes. Whitelaw and colleagues emphasised that these typologies are not discrete, but rather they complement each other and exhibit variability and overlap (Kickbusch, 1997; Poland, 2000; Whitelaw et al., 2001). The theoretical framework of the HPS is most representative of organic and comprehensive levels of settings as defined by Whitelaw and colleagues. However, emerging research in the field actually reflects models that range from a passive to an active model.

Research into the ways schools translate HPS principles into practice should focus on the resulting system change manifest in organisations and conditions as well as on individuals (Greenberg et al., 2001; Wold, 1999). As St. Leger (1997) succinctly argues, “the settings approach has been legitimated more through an act of faith than through rigorous research and evaluation studies…much more attention needs to be given to building the evidence and learning from it” (p. 100). While the theoretical frameworks guiding the HPS approach assume systems thinking and organisational development, initiatives are typically limited to small scale projects (Dooris, 2005). Investigating the multiple dimensions of health promotion in this respect can contribute to research on the effectiveness of HPS in theoretical, methodological, and practical ways. In the next section, I discuss how my research has addressed some of these challenges and how it will contribute to our understandings of HPS.
Research Implications

To assess the health promoting activity from a truly social ecological perspective, a multi-dimensional approach to research and evaluation is required that targets the internal mechanisms by which schools are organised and operate as well as the external mechanisms that affect implementation (Denman, 2002). For example, in an effort to broaden the success of public health efforts, McLeroy and colleagues (1988) suggest adapting Bronfenbrenner’s multiple systems to health promotion strategies to address the microsystem, the mesosystem, the exosystem, and the macrosystem. By adapting Bronfenbrenner’s multiple systems to a multilevel analytic framework, and borrowing terminology and concepts used in school effectiveness research, I have developed a research framework to explore health promoting schools in Canada (Figure 1).

![Figure 1. A health promoting school research framework based on Bronfenbrenner’s social-ecological model and multilevel analyses](image-url)
The mesosystem includes school processes and practices, which have been described as Type B effects, because when statistical adjustments are made for the effects of other factors, they provide a better and more appropriate basis for comparing the performance of schools (Raudenbush & Willms, 1995). School processes refer to how schools are organised and managed, the teaching practices they use, and the climate they create for student learning (Rumberger & Palardy, 2004). Although most schools, especially public schools, have little control over their intake of students and their characteristics, or over the resources and the structural features that are allocated, they do have control over school processes. A number of school processes have been shown to affect student achievement, for example, the utilisation of resources, school restructuring, and policies and practices that affect the social and academic climate of schools (Raudenbush & Willms, 1995). Even though contextual effects influence school practice, the two are conceptually distinct, and schools with similar contexts may vary in practice (see Raudenbush & Willms). The exosystem refers to the partnerships and collaborations among the school, parents, the community, health, education, and social service organisations, while the macrosystem represents public policies at the board, provincial, and federal levels that influence health promoting school activities and developments.

The notion of health being a product of psychosocial factors implies that results of health promoting activity are not limited to tangible health gains. Rather, they should reflect improved ethos or culture within a setting (Whitelaw et al., 2001) derived from multiple research methodologies (Barnekow-Rasmussen et al., 2006). Given the importance of qualitative and quantitative indicators, my research used both forms of analyses to better understand elements of HPS initiatives. Quantitative analyses were
applied to identify the factors (through factor analyses of school-level questionnaires) that represented school contextual effects and processes; hierarchical linear modeling (HLM) was used to examine the relationships between factors that represent the microsystem and the mesosystem and health and wellbeing outcomes. Because an interactive process is required to achieve implementation and programmatic theories (Weiss, 1997), other features of the model, the exosystem and macrosystem, were examined using a qualitative approach that explored links among the contexts and activities, and accounted for people and their environment. By mapping and understanding the relationships, interactions, and synergies within and between different groups, the study was able to generate a theory of the whole system (Dooris, 2005) and validate findings that emerged from the quantitative analyses.

The development of the HPS model was driven by health professionals who saw it as an opportunity to enhance population health by accessing young people across various social strata (Young, 2006). Since the model did not originate in the education sector, there is a need for HPS models to be relevant to both public policy sectors where linkages between education and health can be mapped (St. Leger & Nutbeam, 2000), and the relationship between education and health can be translated into practice. A key element of an effective settings approach to health promotion is that it attends to both public health and organisational agendas, where the action for health must help deliver the core business of the setting (Dooris, 2004). Researchers have called for a closer integration of health and educational activities in advancing HPS (Dooris, 2005; Paulus, 2005). Following their lead, I have developed a research model that blends the theoretical dimensions of the settings approach to promoting health in schools, the social ecological
approach, and the research analytic frameworks used in school effectiveness research to explore the effectiveness of” HPS models and develop health and wellbeing indicators. I anticipate that such a model will be a first step in bridging the health-education nexus by producing research that is recognised by both and serves as a framework for future school health promotion research and practice.

In summary, the goal of my research was to further our understanding of health promoting schools (HPS) and the associated health and wellbeing of students. Quantitative analyses of a large-scale national data set of students across Canada –The Health Behaviour in School-aged Children (HBSC) study– was followed by qualitative data collection and analyses in two schools in Ontario. My research addressed the following research questions:

- To what extent is student health associated with academic achievement?
- How do schools differ on outcome measures of students’ health and wellbeing?
- What are the student- and school-level factors associated with students’ health and wellbeing?
- What does a school that promotes student health and subjective wellbeing look like? In other words, what are the processes, and contextual and organisational structures within schools that are conducive to students’ health and wellbeing?

The data for the quantitative analyses were from the 2006 Health Behaviour in School-aged Children (HBSC) study. The HBSC is the result of an inter-disciplinary, cross-national collaboration that examines the relationship amongst adolescent health and a wide range of determinants. HBSC is an ongoing international project sponsored by the World Health Organization (WHO) in Europe, and in Canada by the Public Health
Agency of Canada. The HBSC’s underlying premise is that the determinants of education and health are closely linked. As such, the study not only addresses traditional indicators of health behaviour but, more importantly, the structural and practical aspects of schools, such as schooling processes, school climate, student attachment and connectedness to school, and the involvement of the community in school life. A short school-level survey completed by a principal or vice-principal at participating schools was included for the first time in Canada in the 2002 survey and was further expanded and administered in the 2006 survey.

The HBSC collects data every four years at the school level from students representing three age groups: the onset of adolescence – age 11; the challenge of physical and emotional changes – age 13; and when very important life and career decisions are beginning to be made – age 15 (Currie et al., 2001). In order to achieve these age groups in Canada, the research team samples students in Grades 6 through 10. A systematic, single-stage cluster sample approach is used to select whole classes of students from across the country. The sample is drawn to be self-weighting, as required by the international protocol. A cluster sample design is used to select classes from public school directories according to school jurisdiction, province, language of instruction, public/Roman Catholic designation, community size, and community location within a province. The resulting sets of classes are proportionally distributed according to the selection criteria. Participation in the survey is voluntary, although active student and parental consent is required.

Student questionnaires are administered to school classes by teachers and require between 40 to 60 minutes of class time. Teachers are asked to closely follow a specific
set of instructions regarding active consent and survey administration. Almost all of the questions can be answered by checking off a response option, with the exception of a few open-ended items. To guarantee anonymity, students put their unsigned completed survey in an envelope and seal it (Boyce, Roche, & King, 2008). The 2006 administration of the HBSC resulted in a national sample of 9,670 students from 200 publicly funded schools. Data were obtained from students in all 10 provinces and three territories. Of these completed surveys, 4584 were from boys (47.4%) and 5086 were from girls (52.6%). The school-level survey was completed by 170 administrators.

The qualitative examination of schools was employed to identify the organisational and structural elements that are essential for achieving a HPS, and the mechanisms by which these elements intervene and interact to produce health and wellbeing outcomes. As such, given the multiple goals proposed by the research model and the quantitative and qualitative analyses conducted, my research is presented as three independent manuscripts that address the research questions that guided my work.

Manuscript 1: Relationship between health and achievement: Evidence from the Health Behaviour in School-aged Children (HBSC) study

If Health Promoting School initiatives are to lead to improved health and academic achievement of students, there is a need to establish the connection between health and education. Moreover, efforts that address the health needs of students and create opportunities for improved wellbeing need to be explored as venues for enhancing academic achievement of students. This manuscript examines health as a determinant of educational achievement with the purpose to establish a gradient in education by health among Canadian students. The manuscript conceptualises health as a predictor of academic achievement.
Adapting models developed by Willms (2003, 2006) to examine the socioeconomic gradient for schooling outcomes, I define a gradient in education by health as the relationship between health and student achievement, in this case students’ self-reported academic achievement. As such, the research examines the variations in student health profiles across schools. The manuscript addresses the following research questions:

- Is there a gradient in education by health among Canadian students?
- Does the gradient in education by health vary significantly within and between schools?
- What can the between-school slopes and the within-school slopes tell us?

**Manuscript 2: Student health and wellbeing: An examination of student and school factors**

The underpinning of HPS philosophy is that schools can play an important role in the overall health of their students. With the increased emphasis on promoting the health of young people, there is a need to explore whether and how schools affect student health. Indicators reflecting students’ general health and wellbeing, and that have been validated in HBSC studies, are examined. The outcomes Self-rated Health, Life Satisfaction, Emotional Wellbeing, and Subjective Health Complaints are derived from the student-level surveys. Using these measures, the variation in health and wellbeing outcomes across schools are estimated. School-level measures are derived from surveys completed by a school administrator at the participating schools. These surveys address issues related to school size and composition, school disciplinary practices, school policies, and teacher morale, satisfaction, and relations with the community.
A set of contextual and compositional school variables at the school level that are associated with student health outcomes and that statistically account for variation across schools are identified. The manuscript addresses the following research questions:

- What are the student-level factors, as reported by students that are related to students’ health and wellbeing outcomes?
- Are there differences between schools on students’ health and wellbeing outcomes?
- What are the school-level factors, as reported by administrators that are associated with students’ health and wellbeing outcomes?

Because student-level variables are nested within the higher level school variables, analyses using hierarchical linear modeling (HLM) enable the disentangling of student and school effects on student outcomes and can account for the non-independence of observations within groups (Ma & Klinger, 2000; Raudenbush & Bryk, 2002). HLM analyses allow the separation of two potential sources of variability across schools (i.e., differences in structures and policies of schools on the one hand, and differences in the intake of pupils on the other). All multilevel analyses are conducted using HLM 6.06 (Raudenbush, Bryk, Cheong, & Congdon, 2004). Two-level HLM models (see Raudenbush & Bryk, 2002; Raudenbush et al., 2004) are estimated to determine which set of student- and school-level variables are associated with the four outcomes.

*Manuscript 3: The health promoting school: Two case studies in Ontario*

The purpose of conducting case studies is to help develop and refine explanatory models of the factors contributing to outcomes identified in the quantitative analyses. Based on the integration of the quantitative and qualitative findings, this manuscript is dedicated to
theory building and understanding how the relationship between health and education can be translated into practice. Such theories are useful because they can be used to develop “testable hypotheses which are then investigated using non-experimental methods” (Rogers, 2007, p. 66), and to develop an evaluation framework to be used in conducting future evaluations. The validity of the research process and the research tools produced is strengthened by engaging a steering committee representing members of education and health from each participating board in the research design.

The case studies were conducted in two schools that had been identified by their respective school boards as health promoting schools. The case studies allow the exploration of the following research questions:

- What makes a school successful at achieving better student health and wellbeing outcomes?
- How are the perceptions of students, teachers, staff, administration, and parents similar or different as to what constitutes a HPS?
- What are the important elements at the structural and organisational levels that are in place for allowing a HPS to be successful?

The case studies include semi-structured interviews with school principals, key informants, and parents; focus groups with teachers and students; and school observations. To ensure consistency in the school visits and data collection, interview protocols and observation guides were developed. The observation guides focused on various aspects of the school and its facilities, including the school environment, playgrounds, recreational areas, and food services. The findings should help establish a deeper understanding of a HPS that
incorporates the collective perspectives of administrators, students, and parents as well as educators and health professionals involved in school health initiatives.

In summary, my research is an attempt to examine the role of Canadian schools in promoting the health and wellbeing of youth. The three manuscripts that constitute the research are intended to contribute to our understanding of the relationships between health and schooling from different angles. The first manuscript establishes the relationship between a measure of student health and wellbeing that has been validated by HBSC researchers and elsewhere, and students’ academic achievement. Evidence of the association between these two constructs is necessary for highlighting the role health plays in student learning. The second manuscript explores the association among a set of school-level factors and student health outcomes and examines their variation across schools. The third manuscript is useful in establishing a programmatic theory that underlies health promoting schools based on two models of HPS.

The value of incorporating the three manuscripts under the banner of settings, health, and wellbeing is in providing a triangulation of information pertaining to a HPS approach. As defined by Stake (2006), “triangulation is an effort to assure that the right information and interpretations have been obtained” (p. 25), allowing a researcher to both confirm research findings and validate how the findings are interpreted by those with different perspectives. I anticipate that the findings of my research will contribute to the growing literature around health and schools and encourage an intersectoral collaboration between health and education around research, policy development, and practice when implementing health promoting school initiatives.
CHAPTER II: RELATIONSHIP BETWEEN HEALTH AND ACHIEVEMENT: 
EVIDENCE FROM THE HEALTH BEHAVIOUR IN SCHOOL-AGED CHILDREN 
SURVEY

Introduction

The relationship between education and health is well established in the literature with respect to adult populations over 25 years old (see Cutler & Lleras-Muney, 2007; Freudenberg & Ruglis, 2007; Mirowsky & Ross, 2003). These studies, examining the relationships between education and health, have generally emerged from fields such as health and economics and tend to explore the relationships between educational attainment and subsequent health behaviours and outcomes. Findings suggest that people having higher levels of schooling also report better health. For example, analyses of data from the National Health Interview Survey (NHIS) support the assertions that education is strongly predictive of adult health (Goesling, 2005). Such studies, described as gradients in health by education (see Cutler & Lleras-Muney, 2007), have generally found strong associations between years of schooling and reports of being in good health; positive health behaviours, such as not drinking and smoking; reduced lost days of work due to sickness; and decreased morbidity and mortality rates (Freudenberg & Ruglis, 2007; Grossman, 2000, 2005). Despite these consistent findings, it remains unclear whether education causally affects health or vice versa or whether “the relationship between education and health is spurious and driven by factors affecting both education and health” (Monheit, 2007, p. 233). Not withstanding the resolution of these questions, it remains certain that education is considered one of the necessary social determinants of health that needs to be addressed to reduce disparities in health and socioeconomic conditions across populations (Low, Low, Baumler, & Huynh, 2005).
Such research has led policy makers in European countries to address health and schooling quality among young people by targeting this population through schools. In their first conference (WHO, 1997), the European Network of Health Promoting Schools (ENHPS) released the Thessaloniki declaration that embodies practical and conceptual links among education, health, participatory values, and policy formulation and implementation. The impetus for such comprehensive school approaches stems from the realisation that healthy students are better learners (Whitty, Aggleton, Gamarnikow, & Tyrer, 1998). This interest extends beyond Europe, such as in Canada, where there has been an increasing interest in promoting health through schools. For example, in 2004, Ontario’s Ministry of Education introduced a new school health programme with the intent of “making Ontario schools healthier places to learn” (October 20th, 2004). Furthermore, a Pan-Canadian Joint Consortium for School Health has been initiated by health and education deputy ministers across Canada. Its first national symposium, *The Communities and Schools for Health*, was held in November, 2004. Although some of the provincial initiatives have been in response to reports of an increase in the proportion of overweight and obese Canadian youth, these initiatives acknowledge schools as “social systems for health” in communities, having the potential to enhance the health of their populations (Rowling & Rissel, 2000). If establishing comprehensive school health initiatives can lead to improved health and academic achievement, there is a rationale to determine the health-education connection among students. Moreover, research in the field of education has identified family, peer, and economic factors as contributing to academic failure; “often lost in this inquiry, however, is consideration of physical and
mental health problems for academic performance” (Needham, Crosnoe, & Muller, 2004, p. 569).

Purpose

This paper conceptualises health as a predictor of academic achievement, adapting models developed by Willms (2003, 2006) to examine the socioeconomic gradient for schooling outcomes. A gradient in education by health is defined as the relationship between health and student achievement, in this case students’ self-reported academic achievement. The purpose of this study is to examine the relationship between self-rated health and academic achievement, and to examine the variations in student health profiles across schools. The following research questions enabled us to address this research purpose:

- Is there a gradient in education by health among Canadian students?
- Does the gradient in education by health vary significantly within and between schools?

Education and Self-rated Health

“Health and education appear to be inextricably linked: good health is necessary for effective learning and education is necessary for maintaining good health” (Davaney, Schochet, Thornton, Fascianao, & Gavin, 1993). Cutler and Lleras-Muney (2007) suggest that poor health among young people contributes to ‘lower levels of schooling’ and that increased educational attainment directly improves health even when controlling for family background and socioeconomic status.

Research with school-aged children suggests that perceptions of one’s health, as assessed by self-rated health, and school achievement go hand in hand. For example,
Koivusilta, Arja, and Vikat Andres (2003) found self-rated health and health behaviours at age 14 to be predictive of educational attainment in adulthood. Perceptions of one’s health as measured by asking people to rate their health provides a summary of subjective as well as objective aspects of their health combined with their perceptual framework (Kaplan & Baron-Epel, 2003, p. 1669). Self-rated health is widely used, and is considered a valid measure of health status as well as of morbidity and mortality (Idler & Benyamini, 1997). Generally, self-rated health among adult populations has been found to reflect physical health problems, such as limitations of physical functioning, chronic and acute conditions, and mental health problems. Similarly, self-rated health among youth appears to encompass more than just physical symptoms. For example, Vingilis, Wade, and Adlaf (1998) proposed that self-rated health among high school students in Ontario was a somatic expression of life distress, which could explain the consistent findings surrounding the relationships between self-rated health and social and economic disadvantages among young people. Wade, Pevalin, and Vingilis (2000) suggest that factors within the external environment, both distal and situational, may be associated with self-rated health, including family socioeconomic status, family attachment, tobacco use, self-esteem, and even school achievement. In their study of adolescents in public high schools, Zullig, Valois, and Drane (2005) found that both self-reported mental health and self-reported physical health contributed significantly to adolescent self-rated health, yet adolescent self-rated health in these samples was “based more strongly on mental health and to a lesser extent on physical health” (p. 7), a finding that is contrary to research with adult samples.
Despite the presence of a small body of research examining correlates of self-rated health among adolescents, only one study was found that examined the association of self-rated health with academic outcomes and that modeled self-rated health as a predictor rather than an outcome in the statistical model. Using data from the National Longitudinal Study of Adolescent Health (Add Health), a large, school-based study of adolescents, their schools, and their families in the U.S., Needham and colleagues (2004) conducted a series of logistic regressions of secondary school students to explore whether or not physical and mental health problems are risk factors for academic failure, controlling for individual and contextual correlates of both health and academic status. To control for pre-existing physical and mental health problems in the sample, only students who did not receive any special education services in the 12 months prior to the first wave of data collection were included in the study. The authors strongly show that self-rated health and emotional distress are both associated with a greater likelihood of failing a class in the subsequent year, controlling for socio-demographic characteristics. Specifically, the odds of failing one course or more during the second wave of the study were 34 percent greater for students who rated their own health as fair or poor during the first wave of the study, compared to those who rated their health as good to excellent, controlling for prior academic achievement.

The link between health status of students and their academic achievement has not been closely examined or documented in Canada. With the increased emphasis in promoting health through schools, it is important to determine if there is a link between students’ health and their academic achievement and the extent to which schools can contribute to students’ health. This research provides an important first step in
understanding the relationships between health and achievement within a Canadian context.

Data and Methodology

The Health Behaviour in School-aged Children (HBSC) study is a cross-sectional survey developed through an inter-disciplinary, cross-national collaboration and examines the relationship between adolescent health and a wide range of determinants. HBSC is an ongoing international project sponsored by the World Health Organization and in Canada by the Public Health Agency of Canada. The HBSC’s underlying premise is that the determinants of education and health are closely linked. HBSC not only addresses traditional indicators of health behaviour but also the structural and practical aspects of schools, such as schooling processes, school climate, student attachment, and connectedness to school, and the involvement of the community in school life. The HBSC offers an opportunity to further the understanding of how incorporation of factors related to the school context can contribute to the health and wellbeing of children and youth. HBSC uses a population health framework, recognising that the determinants of health operate at two levels: (a) the individual level, and (b) the ecological level (Health Canada, 1994). Beginning in 1989 the HBSC now collects data every four years from students in schools across Canada. Data are collected from students representing three age groups: the onset of adolescence – age 11; the challenge of physical and emotional changes – age 13; and when very important life and career decisions are beginning to be made – age 15 (Currie, Samdal, Boyce, & Smith, 2001).

Data for the current study came from the 2006 HBSC student survey. The Canadian sample consisted of a cross-national sample of students in Grades 6 to 10. The
2006 Canadian HBSC survey included 9670 students (47.4% boys and 52.6% girls) from 187 schools across Canada; 1708 students in Grade 6, 1772 students in Grade 7, 1897 students in Grade 8, 2320 students in Grade 9, and 1973 students in Grade 10.

Self-rated health (SRH) is assessed in the HBSC by asking students to respond to the following question: Would you say your health is: (a) excellent, (b) good, (c) fair, or (d) poor? Academic achievement is assessed by the following question: Which of the following best describes your marks during the past year? (a) excellent (mostly A’s / above 85% / or level 4), (b) above average (mostly A’s and B’s / between 70 and 84% / or level 3 and 4), (c) average (mostly B’s and C’s / between 60 and 69% / or level 3), (d) below average (Mostly C’s / between 50 and 59% / or level 2), and (e) poor (mostly marks below C / below 50% / or level 1).

Before addressing the research questions, the gradient in education due to health was defined to consist of three components: (a) the level of the gradient, (b) the slope of the gradient, and (c) the strength of the gradient. These elements are based on Willms’ socioeconomic gradient examining the relationship of socioeconomic status (SES) and academic achievement outcomes based on the Programme for International Student Assessment (PISA) data (2003, 2006). The SES measures were substituted with health measures from the HBSC. The level of the gradient is defined as the expected marks in the past year for a student with average SRH. The level of a gradient for a school is an indication of the overall performance of the school, after taking account of students’ SRH. The slope of the gradient is an indication of the extent of inequality attributable to SRH. Steeper gradients indicate a greater impact of SRH on marks – “that is, greater inequality– while gradual gradients indicate a lower impact of [SES] – that is, less
inequality” (Willms, 2003, p. 5). The strength of the gradient refers to the extent to which marks vary above and below the gradient line. A strong relationship implies that a considerable amount of the variation in marks is associated with SRH, whereas a weak relationship indicates that relatively little of the variation is associated with SRH. The strength of the relationship is assessed by the $R$-squared value of the regression line.

The first objective involved examining the associations of self-rated health with academic performance, or in other words, the gradient in education by health for students in the sample. Using the Statistical Package for the Social Sciences (SPSS 16.0), Ordinary Least Squares regression (OLS) was conducted to obtain the levels, slopes, and strengths of the gradient by regressing academic performance as a raw score on the standardised measure of self-rated health for each of the schools separately. In addition, estimating the strength of the education by health gradients within and between schools required creating a school-level file with student aggregate data for health and achievement. When the focus is estimating fixed parameters, Kreft (1996) suggests that researchers should strive to have at least 30 groups with at least 30 cases per group for the analysis. Based on this recommendation, only schools with 30 or more students were selected in order to obtain relatively stable school estimates. The resulting sample contained 8626 students from 131 schools. The school samples ranged in size from 31 to 226 students, with a mean of 66 students per school. The wide range of students per school reflects the range of school size in the sample as well as school configuration (K-12, K-8, 6-8, 9-12, etc.). Slopes of the health gradient for the set of schools were derived from a set of within-school equations (Willms, 2003; 2006):

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + r_{ij}$$
Where $\beta_{0j}$ is the level of the gradient in education by health, and $\beta_{1j}$ is the slope of the gradient for the set of schools. $B_0$ is the expected achievement for a person with average SRH for a school. $\beta_1$ is the extent of inequality in academic achievement attributable to health. A steep slope indicates a pronounced relationship between health and achievement for a particular school.

The second objective involved estimating the strength of the education by health gradients within and between schools. A school-level file with student aggregate data for health and achievement was created. The slopes ($\beta_{ij}$) from each regression equation for each of the schools were added as variables to the aggregate school file. The strength of the gradient was estimated by regressing academic performance as a raw score on the standardised measure of self-rated health for the 131 schools in the aggregate file.

The third objective of this study was to examine whether or not the gradient in education due to health varied significantly within and between schools. Although the gradient lines derived from the OLS analysis do convey information about the distribution of academic achievement relative to SRH, they do not show how these relationships vary within and between schools. These effects can be estimated through a hierarchical analysis that accounts for the clustering of students within schools, an estimation that is not possible in OLS. A two-level HLM model (Version 6.06, Raudenbush, Bryk, Cheong, & Congdon, 2004) was employed in three stages. The first stage produced a null model containing no explanatory variables to explain the amount of variability present at each of the student and school levels and partitioning of variance into within-school ($\sigma^2$) and between-school ($\tau_{00}$) components for each of the outcome measures (Snijders & Basker, 1999). In the second stage, and following the
recommendations of Raudenbush and Bryk (2002, p. 141), SRH at the student level was added to the level-1 model and its aggregate (Xij) was included in the final level-2 model. Applying group-mean centering to SRH in the level-1 model allows the decomposition of the relationship between SRH and academic achievement into its within- (βw) and between- (βb) group components (see Raudenbush & Bryk, 2002); βw is the average within-school gradient in achievement due to health; βw is defined here as the expected difference in achievement between two students in the same school who differ by one standard deviation unit on SRH; while βb is the between-school gradient in achievement due to health and is defined here as the expected difference between the mean academic achievement of two schools that differ by one unit in mean SRH (Raudenbush & Bryk, 2002).

The mean of the within-school slopes (βw) for the 131 schools, is γ01:

$$β_{oj} = γ_{00} + γ_{01} X_{ij} + u_{0j}$$

The within-school slope consists of the variation in individual scores around their respective school means. The mean of the between-school slopes (βb) for the 131 schools, is γ10:

$$β_{1j} = γ_{10} - u_{1j}$$

Demonstrating the proportion of variation in schooling outcomes that is within and between schools allows the estimation of the contextual effect due to health on academic performance (Willms, 2003). Contextual factors include the social and economic characteristics of the community in which the school is located and the demographic composition of the student body, such as ethnicity and gender; family characteristics, such as socioeconomic status and family structure; and academic achievement (Willms, 2002; Rumberger & Palardy, 2004). Contextual factors create a
normative environment that promotes or undermines academic learning. According to Raundenbush and Bryk (2002), the contextual effect ($\beta_c$) “is the extent to which the magnitude of the organisation-level relationship, $\beta_b$, differs from the person-level effect, $\beta_w$” (p. 139), and is estimated by the difference of the between-school slope and the within-school slope ($\beta_b - \beta_w$). In this paper, $\beta_c$ is the expected difference in achievement between two students who have the same levels of self-rated health (SRH), but who attend schools differing by one standard deviation unit in mean SRH.

Results

In terms of the four categories of self-rated health (SRH) across the 131 schools, approximately 28.7% of students reported excellent health, 55.1% of the students reported good health, 14.3% reported fair health, and only 2.0% (173 students) reported poor health. Thus the vast majority of students reported they believed they were either in good or excellent health. To the extent the scale can be considered a continuous scale, the mean health rating was 3.11 (on a 4-point scale) with a standard deviation of 0.71. Aggregated to the school level, the variation in the health scores was reduced to 0.15. In terms of achievement during the previous year, 23.7% of students reported average marks that were 85% or greater, 45.8% reported marks between 70% and 84%, 24.1% reported marks between 60% and 79%, and 6.4% reported marks between 50% and 59%. None of the sampled students reported average marks less than 50%; hence only four categories for marks were used. Considering achievement to be on a continuous scale, the average achievement score across students was 2.87 on the resulting 4-point scale with a standard deviation of 0.85. Aggregated to the school level, the variation in achievement scores was
reduced to 0.27. Thus there appears to be less variability across schools in terms of students’ self-rated health compared to students’ academic achievement.

There also appeared to be a relationship between SRH and marks. Higher levels of students’ SRH were associated with higher overall marks. The sample of students reporting poor health had mean marks of 2.37, those reporting fair health had mean marks of 2.64, those reporting good health had mean marks of 2.91, and finally those reporting excellent health had mean marks of 3.03 (p < .001).

Figure 2 contains the 131 separate within-school health gradients, comparing students’ SRH with their marks in each school. As shown, the within school gradients indicate a positive relationship between SRH and marks. The different slopes further indicate this relationship varies across schools, implying the relationship between SRH and achievement is not fixed. The differences in the length of the regression lines were due to differences in the reported ranges of standardised SRH in each school.
Figure 2 further highlights that the relationships between SRH and marks vary within and between schools. A student with an average SRH could be expected to have a mean achievement score of 2.87 on the 4-point achievement scale. The slope for the between-school gradient in education by health is .58. The within-school gradient line (see Figure 3) represents the average within-school gradient for the 131 schools. The slope for this gradient is 0.14, indicating that a unit increase in SRH results in a 14% of a standard deviation increase in achievement or 0.12 points increase in letter marks for a student. 

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2 Standard deviation for marks =0.85; 14% of 0.85 = 0.12.
Each of the diamonds in Figure 3 represents a school. Schools that lie above the within-school regression line have relatively higher marks than expected given their students’ average SRH levels, while those below the line have relatively lower marks than expected given their students’ average SRH levels. For the within-school gradient in Figure 3, $R^2 = .027$, indicating that only 2.7% of the variation in marks within schools is associated with students’ SRH. However, $R^2$ for the between-school gradient equals .198, implying that around 20% of the variation in marks between schools is associated with differences in the students’ aggregated SRH within the school.

Consider the gradient lines for selected schools highlighted in Figure 4. These gradient lines illustrate the health inequalities between schools. School 137 and school 58 are both below the within-school gradient, and both have similar mean marks. Students reporting average health in school 137 have a grade average of 2.43, while those in school 58 have a grade average of 2.37. However, the relationship between health and marks for school 137 is more or less constant with little if any relationship between students’ SRH and achievement. However, as suggested by the steeper slope for school 58, students’ marks increase by .298 points for each standard deviation increase in SRH in that school. Thus in this school, the relationship between SRH and marks is more pronounced, and students with higher levels of SRH are more likely to report higher marks.
Figure 3. Between- and within-school gradients

\[ Y_B = 0.58x + 2.87 \]
\[ Y_w = 0.14x + 2.87 \]

Figure 4. Within-school gradient and gradients for select schools

Note. The first value in the bracket is the intercept corresponding to the designated school. This intercept refers to the academic achievement for a student in that school who reports mean (average) self-rated health across all schools. The next value in the bracket refers to the slope of the gradient corresponding to the designated school. This value represents the change in marks associated with a one standard deviation unit
increase in self-rated health for a student in that designated school. For example, on a 1 to 4 scale for marks, a student in school 58 would have a .30 increase in marks.

School 121 and school 64 both have above average school achievement. Students reporting average health in these schools have average marks of 3.23 and 3.13 respectively. Once again, the relationship between health and marks varies for these two schools. Increases in SRH are more closely associated with increased achievement for students in school 121 where the steeper gradient (0.53) indicates that a one standard deviation increase in SRH results in a .53 points increase in marks. Students in school 121 with higher levels of SRH tend to achieve higher marks than those reporting below average health. On the other hand, while a student with average SRH in school 64 has similar performance to his/her counterpart in school 121, the differences in achievement between students reporting low SRH and high SRH are not as pronounced in school 64. This result suggests there is less inequality in achievement for students of varying SRH in school 64 than school 121.

The contextual effect $\beta_c$ in this analysis was 0.46 ($\beta_b = 0.64$ and $\beta_w = 0.18$) suggesting that approximately 75% of the variability in the within- and between-school slopes can be attributed to contextual factors attributed to the schools and the community in which the schools operate (Raudenbush & Willms, 1995).

Discussion and Implications

At the centre of the health promoting school movement is improving health and educational achievement for all students within a school. In terms of an education by health gradient perspective, this goal translates into not only raising the levels of achievement and student health, but also minimising the extent to which poor student self-rated health is associated with lower academic performance. It is clear from this
analysis that some schools are able to achieve both: higher levels of achievement (e.g., schools 64 and 121), and less inequality in achievement in relationship to health (e.g., school 64). The potential policy implications of these findings are that programmes and interventions in schools with steep slopes (e.g., school 121) should aim to shift opportunities towards disadvantaged students with poor SRH. On the other hand, programmes and interventions in schools with low achievement and shallow gradients (e.g., school 137) may be better served implementing broader school polices focusing on improving the academic achievement of students along the SRH continuum, while ensuring that students whose self-rated health is compromised are supported as well. The analysis also illustrates that the academic performance of students reporting poor health is on average 0.71 of a standard deviation lower than students who report high SRH\(^3\). Thus identifying students with lower reported levels of SRH may provide a mechanism to identify students at greater risk academically in order to provide them with additional supports and resources that would foster their learning.

It is becoming more apparent that educational attainment is closely linked to health promotion efforts in school (Paulus, 2005), and the means by which schools promote student wellbeing through their organisation and structure (Markham & Aveyard, 2003). Potential sources of variability in the relationship between health and academic achievement are factors inherent to the structure and operations of a school. These factors have been described by Willms (2003) as contextual factors, consisting of the environment in which teaching and learning takes place, school and classroom resources, interaction among peers, the relationships between teachers and students, the

\(^3\) Standard deviation for SRH =0.71; mean marks for students who report excellent health = 3.03 while mean marks for students who report poor health=2.37.
disciplinary climate of the classroom, and the norms for academic success. Other contextual variables are the school location (urban, suburban, or rural), size and type (public or private), and school resources such as the ratio of students to teachers.

The contextual effect in this analysis of 0.46 suggests that the difference in slopes can be explained by contextual factors attributable to schools or the collective properties of schools. These findings help explain the results that only 2.7% of the variation in marks within schools is associated with SRH, while around 20% of the variation in marks between schools is associated with SRH (Figure 2).

Klinger and colleagues (2006) state that achievement is not only related to the efforts and actions of individual students “but also to the efforts and activities of schools and their staff” (p. 751); such contextual variables are important and need to be considered when examining student achievement. Studies have found that school contextual factors predict school engagement, achievement, and dropout rates, even after controlling for the effects of individual background characteristics of students (Willms, 2003). An explanation offered in this regard is that schools with differential contexts and climates channel students with varying characteristics (inputs) into various categories of schooling outcomes (outputs) (Ma & Crocker, 2007, p. 88).

This paper has demonstrated a positive relationship between students’ SRH and their academic marks. Needham, Crosnoe, and Muller (2004) point out that “if child and adolescent health problems destabilise student trajectories through the formal schooling system, then the negative long-term association between educational attainment and adult health may be due, in part, to these early health problems” (p. 582). Efforts that address
the health needs of students and create opportunities for improved health should be explored as possible venues for enhancing academic achievement of students. Further analyses of the HBSC 2006 data will examine the associations of school-level factors, representing the contextual factors that are derived from the school-level surveys, to student health outcomes.

The study is limited by the self-reported scores for both health and academic achievement. In addition, the scales used may be more ordinal than continuous in nature. More reliable student achievement data would be made possible if HBSC surveys were linked to provincial achievement data. In addition, sampling for provincial- and board-level data would provide considerable information about the distribution of health and achievement, the relationship between them, and how these relationships vary between and within these jurisdictions.

Policy recommendations outlined by Cutler and Lleras-Muney (2007) to diminish the gradients in health by education are designed to improve the quality of schooling and promote college and university attendance (National Poverty Center, 2007). In this respect, some argue that “health policy and education policy represent a two pronged approach to improving population health” (Monheit, 2007, p. 236). Others acknowledge the substantial interface between education and health at an early stage of human development and suggest health promotion, in its broad sense, contributes to a school’s educational aims. Therefore, from this perspective, those dimensions that constitute effective and good schools, and those that promote the health and wellbeing of students, are not discrete but overlap (Paulus, 2005). It is essential then that education and health
sectors move to develop a common agenda and a shared public policy that can address
the health of young people in schools and their academic achievement in tandem.
CHAPTER III: STUDENT HEALTH AND WELLBEING: AN EXAMINATION OF STUDENT AND SCHOOL FACTORS

Introduction

Adolescents spend a substantial portion of their lives in school settings, and their experiences in schools not only affect their academic development but also strongly influence their social-emotional and physical health development, both positively and negatively (Wells, Barlow, & Stewart-Brown, 2003). Specifically, students’ health behaviours and their views of themselves are related to their lives in school (Anderman, Maehr, & Midgley, 1999). In addition to the direct teaching of academic skills, schools provide opportunities for adolescents to develop relationally, emotionally, and behaviorally in ways that often have lasting impacts on their lives (Wilson, 2004). Given these important impacts of schools, it is not surprising that the values and expectations of society as a whole are reflected in our schools. Schools find themselves under constant demand to validate and legitimise their roles in a changing society, shifting the emphasis on the various outcomes of schooling (Paulus, 2005). Currently, these shifting expectations have resulted in a move away from conventional academic outcomes, to include efforts that address students’ physical and mental health.

In contrast to these expectations, since the onset of research on “effective schools” in 1979 (Rutter et al.), student outcomes have been progressively narrowed to primarily assess academic outcomes, which are important, but not the only ones that matter (Hargreaves, 2001).

In response, there has been an ongoing call for school reform efforts to incorporate affective (psychological and emotional) outcomes in conjunction with academic
(cognitive) outcomes (Phillips, 1993; Hegarty, 1994; Huebner & McCullough, 2000; Fitz-Gibbon, 2006; Weare & Gray, 2003). These efforts may be particularly important because physical and mental health problems in childhood and adolescence may compromise academic functioning (Field, Diego, & Sanders, 2001; Needham, Crosnoe, & Muller, 2004; Thies 1999). Moreover, it is becoming more apparent that educational attainment is closely linked to health promotion efforts in school (Paulus, 2005), and the means by which schools promote student wellbeing through their organisation and structure (Markham & Aveyard, 2003). Earlier research by Knuver and Brandsma (1993), employing models that examined relationships at the student and school levels, found that schools that were effective in the cognitive outcomes were also effective in promoting the affective outcomes. Therefore, it is reasonable to state that the dimensions that constitute effective and good schools, and those that promote the health and wellbeing of students, may not be discrete. These dimensions likely overlap, and efforts to improve student health through broad school interventions contribute to a school’s educational aims (Paulus, 2005).

Comprehensive School Health initiatives and their European counterpart, Health Promoting Schools (HPS), have been proposed as having the potential of developing the positive health attributes of students (St. Leger, 2000), and their mental and social wellbeing (Lister-Sharp, Chapman, Stewart-Brown, & Sowden, 2000). HPS principles are rooted in social ecological models that emphasise the need to address a setting’s organisational and structural features (Dooris, 2004). However, there is a lack of operationalisation of these dimensions, particularly as they relate to a school’s environment and its links with the community (Deschesnes, Martin, & Jomphe Hill,
As such, identifying school factors and conditions that are associated with student health and wellbeing would be useful for developing HPS initiatives. In response to this need to identify such factors, this study addresses the following research questions:

- To what extent do student health and wellbeing outcomes vary across schools?
- What are the student-level factors that are associated with students’ health and wellbeing outcomes?
- What are the school-level factors, as reported by administrators, that are associated with students’ health and wellbeing outcomes?
- To what extent does the relationship between school-level and student-level variables vary across different conditions?

Research Context

Schools are increasingly recognised as social systems with the potential to enhance the health of their populations (Rowling & Rissel, 2000). These developments are rooted in social ecological models of health that generally reflect a broad vision of wellbeing encompassing physical activity, mental and emotional wellbeing, and social cohesion at both the organisational and community levels (Dooris, 2004). Accordingly, the “health promotive capacity of an environment must be defined in terms of the multiple health outcomes resulting from people-environment transactions” (Stokols, 1992, p. 19) and the environmental resources or constraints that could influence personal and collective wellbeing.

The underlying premise of HPS is that longer-term health improvements will only ensue if initiatives are integrated into a broader, multi-faceted health promotion strategy...
that supports sustained change, and moves “beyond the individual to encompass the school environment, structural issues and organisational practice” (Inchley, Muldoon, & Currie, 2006, p. 66). The aims of HPS include improving student healthy behaviours and lifestyles through increased physical activity and improved nutritional practices. Certainly, these outcomes are most often examined in empirical research. Recently, mental health and emotional wellbeing outcomes are also being considered, both as ends in themselves and as pathways to improving academic performance.

Within education, conceptual frameworks examining school effectiveness research view “schooling as a multilevel or nested phenomenon in which the activities at one level are influenced by those at a higher level” (Rumberger & Palardy, 2004, p. 237). Because student-level variables are nested within the higher level school variables, analyses using hierarchical linear modeling (HLM) enable the disentangling of student and school effects on student indicators and can account for the non-independence of observations within groups (Ma & Klinger, 2000; Raudenbush & Bryk, 2002). HLM analyses allow the separation of two potential sources of variability between schools: school inputs and school processes (Palardy, 2008). School inputs include compositional factors, school resources, and school structures. Compositional factors consist of the social and economic characteristics of the neighbourhood in which the school is located, the demographic composition, and the academic aspirations of the student body. The social characteristics of schools predict school engagement, achievement, and dropout rates, even after controlling for the effects of students’ individual background characteristics (Rumberger & Palardy, 2004, Willms, 2002). The school inputs are
considered exogenous to the practices of the school’s administrators and teachers yet create a normative environment that promotes or undermines academic learning.

In contrast, school processes are endogenous and have been described as Type B effects, because when statistical adjustments are made for the effects of other factors, they provide a better and more appropriate basis for comparing the performance of schools (Raudenbush & Willms, 1995). School processes refer to how schools are organised and managed, teaching practices within schools, and the climate schools create for student learning (Rumberger & Palardy, 2004). Variations in school processes and practices have been examined in relation to students’ academic achievement (Lee, 2000; Ma & Willms, 2004), young people’s health complaints (Karvonen, Vikat, & Rimpela, 2005), students’ physical and mental health (Ma, 2000), and adolescent risk and health behaviours (Maes & Lievens, 2003). Findings from these studies indicate that differences in school processes are associated with differences in these student outcomes. While variations in outcomes have been identified across settings, there is a continued need to examine the underlying causes of these variations (Duncan, Jones, & Moon, 1998).

Nonetheless, the interactions between school inputs and processes are complex and are considered to be a function of broader geographic units, such as neighbourhoods. The communities where people reside have been linked to variations in individual-level health indicators (e.g., Sampson, 2003; Sellstrom & Bremberg, 2006). Recent studies in education have also hypothesised school factors as intermediaries of the neighbourhoods within which the schools are located. Schools as mediators of neighbourhood effects have been examined in relation to educational attainment (Brännström, 2008; Kauppinen, 2007), and academic streaming (Kauppinen, 2008). Support for the theoretical
frameworks underlying these studies derives from Social Control Theory (SCT) (Jencks & Mayer, 1989, 1990). SCT as applied to school contexts suggests that schools situated in disadvantaged neighbourhoods may find it difficult to attract and retain qualified teachers and staff compared to schools in more affluent neighbourhoods, and can also differ on the range and quality of resources available to them (Kaupinnen, 2008; Nash, 2003; Willms, 2004).

One suggested mechanism linking characteristics of a neighbourhood to a school’s context is through the ‘contagion theory’ (Jencks & Mayer, 1989, 1990), which has been the standard explanation for the compositional effects of schools (Dreeben & Barr, 1988 as cited in Kaupinnen, 2008). According to the contagion theory, the socioeconomic composition of a neighbourhood determines what kind of behavioural norms are transmitted through the means of peer influence. This contagion of behaviours and attitudes from peers may occur in the school setting. Accordingly, the school neighbourhood may affect its social composition and determine the prevailing educational orientations and normative school ethos (Kaupinnen, 2008). Results of a 10-year longitudinal study of 1,233 boys and girls from 217 public and private schools in Quebec, Canada lend support to this theory (LeBlanc, Swisher, Vitaro, & Tremblay, 2008), that when students with behaviour problems congregated in a common locale, or were concentrated within the same school, they tended to reinforce each other’s behaviours. The researchers concluded that the level of problem behaviours in a school is influenced to a large extent by the composition of the student body rather than by school organisational factors. Acknowledging the substantial effect that the inadvertent selection process contributes to a school’s composition, Nash (2003) argues that schools can play a
part in modifying their contexts and processes, thereby affecting student academic outcomes. The complexity of disentangling the different dimensions of schooling warrants further exploration, particularly as they relate to the determinants of student health and wellbeing. Investigating the role of schools in this respect can contribute to the understanding of HPS in theoretical and methodological ways.

Data and Methodology

The data set used for this analysis is the Health Behaviour in School-aged Children (HBSC) study conducted in Canada in 2006. The HBSC is an inter-disciplinary, cross-national collaboration that collects cross-sectional data every four years from students representing three age groups: the onset of adolescence – age 11; the challenge of physical and emotional changes – age 13; and the period life and career decisions are beginning to be made – age 15 (Currie et al., 2001). Principals or vice-principals at the participating schools also complete a short survey addressing issues related to school size and composition, school disciplinary practices, school policies, and teacher morale, satisfaction, and relations with the community.

The 2006 administration of the HBSC in Canada consisted of a national sample of 9,670 students from 200 publicly funded schools. Data were obtained from students in all 10 provinces and three territories. Of these completed surveys, 4584 were from boys (47.4%) and 5086 were from girls (52.6%). The school-level survey was completed by 187 administrators. Hox (1998) suggests that examining random effects and cross-level interactions in multilevel analysis requires having a large number of groups at the higher level. He recommends that researchers have at least 100 groups with 10 cases per group; hence schools with 15 or less students were not included in the analysis.
Measures and Variables

The notion of health being a product of social ecological factors implies that results of health promoting activities are not limited to observable health gains. Rather, they should reflect improved ethos or culture within a setting (Whitelaw et al., 2001). The HBSC study recognises the multidimensional nature of adolescent health and adopts measures that are representative of generalised wellbeing and indicators of students’ emotional health (Freeman, 2008). Self-rated Health assesses perceived overall health status and is based on a single Likert-type item. The HBSC has used the Cantril ladder (Currie et al., 2001) as a global measure of student Life Satisfaction since 1998. Student life satisfaction is recognised as a measure of adolescent wellbeing because of its association with school and family factors, interpersonal relations, and indicators of adaptive functioning such as self-esteem (Huebener, Drane, & Valois, 2000; Huebner, Ash, & Laughlin, 2001). The Emotional Wellbeing Scale is a Canada-specific scale ($\alpha = .83$) and consists of variables that assess a range of self-concept and emotional health. Lastly, the Subjective Health Complaints Scale ($\alpha = .80$) is a measure that has been developed and validated by HBSC researchers both in Canada and internationally with the goal of assessing a range of psychosomatic health complaints (Currie, Samdal, Boyce, & Smith, 2001). Descriptive statistics for these outcome measures are provided in the first horizontal panel in Table 1. Details of the outcome and predictor variables and scales are provided in Appendix A.

Student-level Predictor Variables and Scales

The selection of student-level variables to be included in the model was based on characteristics that would adjust for compositional differences within schools (McNeely,
Nonnemaker, & Blum, 2002), and are considered as statistical controls or social
distribution parameters (Lee, 2000; Palardy, 2008). Demographic measures included
gender, family structure, and family wealth. Students’ academic achievement was also
included as a student-level predictor (see Table 1). A composite measure was created to
assess students’ perceptions of the neighbourhood where they lived. The Neighbourhood
Scale ($\alpha = .80$) consisted of 7 variables. Pearson correlation for the Neighbourhood Scale
and perceived family wealth was low but statistically significant ($r = .22$) supporting the
need for including these two apparently distinct demographic variables in the model.
Table 1

*Description of Student-Level and School-Level Variables*

<table>
<thead>
<tr>
<th>Outcome measures</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-rated health</td>
<td>3.12</td>
<td>0.70</td>
</tr>
<tr>
<td>Life satisfaction</td>
<td>7.40</td>
<td>1.83</td>
</tr>
<tr>
<td>Emotional wellbeing (scale index)</td>
<td>38.21</td>
<td>6.82</td>
</tr>
<tr>
<td>Subjective health complaints (scale index)</td>
<td>31.38</td>
<td>6.53</td>
</tr>
<tr>
<td>Predictor variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.53</td>
<td>0.50</td>
</tr>
<tr>
<td>Family structure</td>
<td>0.68</td>
<td>0.47</td>
</tr>
<tr>
<td>Family wealth</td>
<td>3.71</td>
<td>0.98</td>
</tr>
<tr>
<td>Academic achievement</td>
<td>2.88</td>
<td>0.84</td>
</tr>
<tr>
<td>Neighbourhood (scale index)</td>
<td>27.84</td>
<td>4.35</td>
</tr>
<tr>
<td>School-level variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of students</td>
<td>54.74</td>
<td>36.10</td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>15.91</td>
<td>2.49</td>
</tr>
<tr>
<td>School socioeconomic standing</td>
<td>1.84</td>
<td>0.75</td>
</tr>
<tr>
<td>School academic standing</td>
<td>3.27</td>
<td>0.70</td>
</tr>
<tr>
<td>Organisational health (scale index)</td>
<td>40.10</td>
<td>4.44</td>
</tr>
<tr>
<td>Aggregate school climate (scale index)</td>
<td>33.92</td>
<td>2.56</td>
</tr>
<tr>
<td>Student aggression (scale index)</td>
<td>8.89</td>
<td>2.24</td>
</tr>
<tr>
<td>Student problem behaviours (scale index)</td>
<td>9.80</td>
<td>3.10</td>
</tr>
</tbody>
</table>
School-level Predictors and Scales

Factors that reflect features of the schools were derived from the school-level survey. Due to incompleteness of responses to the HBSC school-level survey, many questions with a high proportion of missing variables were lost when list-wise deletion was conducted, which reduced the number and range of school-level variables available for analysis. Composition and demographic characteristics of the school were examined using the following: number of students, student-teacher ratio, school socioeconomic standing as inferred from the socioeconomic level of the community that the school serves, and the school’s academic standing relative to other schools. The schools’ behavioural climate was measured using a set of 12 problems. An exploratory factor analysis, using Principal Component Analysis (PCA) with Varimax rotation, was employed for 11 of the variables (weapon possession was reported as a problem in only a few schools and was excluded), to determine the factor structure underlying these variables. Factors with eigenvalues greater than 1.0 were retained, and variables with loadings less than 0.4 were suppressed. Two factors emerged with loadings ranging from 0.571 to 0.835, and with no crossloadings. Constructions of the scales were done independently, that is, no decisions were based on prior knowledge of relationships among the independent and dependent variables. The set of variables loading on Factor 1 ($\alpha = .82$) were labeled Problem Behaviours, since they reflected general problems found in most schools. The set of variables loading on Factor 2 ($\alpha = .74$) were labeled Student Aggression, and these reflected more severe forms of student problem behaviours that would likely be found in high-tension school environments.
A set of questions about teachers’ sense of control, their job satisfaction and relationship with the school’s community, and the school’s learning environment, were completed by school administrators. Factor analysis of this set of teacher-based items did not result in clear factor loadings. Horn’s (1965) Monte Carlo PCA for Parallel Analysis confirmed a one-factor solution, and these variables were summed as a scale labelled Organisational Health ($\alpha = .76$).

To gauge the school’s climate as perceived by students, a School Climate Scale ($\alpha = .84$), consisting of six student-level variables, was aggregated and included in the school-level file. A number of the items from the School Climate Scale have been previously used in the literature to create a School Connectedness Scale (McNeely, Nonnemaker, & Blum, 2002; Thompson, Iachan, Overpeck, Ross, & Gross, 2006). The label School Climate was retained since it matches other research that uses a similar title, and it remains consistent with research conducted by Canadian HBSC researchers (Boyce, Roche, & King, 2008).

Data Analysis

Student- and school-level variables were transformed linearly, reversing the scoring as necessary using SPSS 16.0. Scales were created by summing the scores of the items comprising each scale, such that higher scores indicated a more favourable health indicator. Outcome measures were standardised as $z$-scores to allow the measures of effect to be reported in standard deviation units. Each student-level survey was matched to a corresponding identification number on a school-level survey. Since HLM can not have missing data at Level 2, student surveys from schools that did not have a completed administrator survey were eliminated, reducing the sample size to 6126 students nested
within 134 schools. The student and school samples were subsequently analysed using HLM 6.06 (Raudenbush, Bryk, Cheong, & Congdon, 2004).

The multilevel statistical model aims to explain the variation in a given indicator by examining differences at the student- and school-levels, where students are nested within their schools. A two-level HLM model (see Raudenbush & Bryk, 2002; Raudenbush et al., 2004) was employed to determine the student and school variables associated with the four outcomes. Separate HLM analyses were conducted for each of the outcome variables: (a) Self-rated Health; (b) Life Satisfaction; (c) Emotional Wellbeing; and (d) Subjective Health. Each analysis was done in four stages. The first stage produced a null model containing no explanatory variables to explain the amount of variability present at each level (Snijders & Basker, 1999), and partitioning the variance into within-school ($\sigma^2$) and between-school ($\tau_{00}$) components (Schumaker & Bembry, 1995). Student-level variables were added to the null model in the second stage, first separately to determine if these variables had a significant absolute effect on the health and wellbeing measures, independent of other variables, and to examine if the effect was fixed or random. A random effect, as opposed to a fixed effect, occurs if a student-level variable has a varying relationship with an outcome across schools.

Student-level variables significantly associated with the outcome variables were then added in combination to determine if each variable had a significant relative effect on the health and wellbeing outcomes adjusting for the shared effects of the other Level-1 variables. Student-level variables were group-mean centered since this procedure allows for the detection and estimation of the slope heterogeneity (Raudenbush & Bryk, 2002) and “is likely to produce more robust estimates of unit-specific regression equations than is grand-mean centering” (p. 149). Group-mean centering decomposes the relationship
between a student-level variable and an outcome into its within- and between-group components.

Following the same procedure, the school-level variables were added to the Level-1 model in the third stage, first separately to examine their absolute effects, and then in combination to examine their relative effects while controlling for other school-level variables. In the fourth stage, an examination of whether the differences in the slopes in level-1 variables (random effects) could be explained by school-level variables was employed, helping to model the variation in the relationship of students’ individual characteristics to the outcomes.

Results

Descriptive Statistics

Correlations amongst the four outcomes were low to moderate but statistically significant. The strongest correlations were between Subjective Health Complaints and Emotional Wellbeing ($r = .50$) and between Emotional Wellbeing and Life Satisfaction ($r = .48$); followed by the correlation between Life Satisfaction and Self-rated Health ($r = .38$). The correlation between Subjective Health Complaints and Self-rated Health was relatively low ($r = .30$), implying that Subjective Health Complaints and Self-rated Health may target different dimensions of health, and that the Subjective Health Complaints and Emotional Wellbeing scales may both be indicative of psychological wellbeing. Correlations among the school variables were moderate but significant and ranged from .19 to .49.

Partitioning of Variance
All four outcomes varied significantly between schools according to the null models (p < .001). The statistically significant between-school variances indicate variations across schools in Canada for Self-rated Health: $\tau_{00} = \text{var} (u_{0j}) = 0.019$, ($\chi^2 (133) = 251.5, \text{Deviance} = 17470$); Life Satisfaction: $\tau_{00} = \text{var} (u_{0j}) = 0.032$, ($\chi^2 (133) = 332.0, \text{Deviance} = 16987$); Emotional Wellbeing: $\tau_{00} = \text{var} (u_{0j}) = 0.035$, ($\chi^2 (133) = 339.3, \text{Deviance} = 17110$); and Subjective Health: $\tau_{00} = \text{var} (u_{0j}) = 0.051$, ($\chi^2 (133) = 415.5, \text{Deviance} = 17213$).

Estimates of the effect sizes of the explanatory variables and their respective standard errors are reported for each outcome (see Table 2). The effect size is the amount of change in a health and wellbeing indicator, “expressed as a proportion of a standard deviation change,” in a health outcome, associated with a one unit change in an explanatory variable (Ma & Klinger, 2000, p. 43). When group-mean centering, the effect size in the Level-1 model, known also as the within-school slope, is the expected difference in a health and wellbeing outcome between two students in the same school who differ by one unit on an individual-level variable. For the Level-2 model, the effect size, known also as the between-school slope, is the expected difference between the mean health and wellbeing outcome of two schools that differ by one unit on a school-level measure (Raudenbush & Bryk, 2002). Table 2 presents the fixed-effects and random intercept estimates and variances based on the fourth stage of analysis in which both student- and school-level predictors were included in the model. The results of these analyses are described more fully below.
Predictors of Student Health and Wellbeing

Self-rated Health. Approximately 98% of the variance in students’ Self-rated Health (SRH) was between students with just 2.0% occurring between schools. All five student-level predictors were significantly associated with SRH (see Table 2). Higher levels of SRH were associated with better perceptions of one’s neighbourhood ($\gamma = .26$, $p < .01$), family wealth ($\gamma = .14$, $p < .01$), academic achievement ($\gamma = .20$, $p < .001$), living with both parents ($\gamma = .05$, $p < .001$), and being a boy ($\gamma = .20$, $p < .001$). Students’ SRH was lower in schools with higher incidences of problem behaviours ($\gamma = -.03$, $p < .001$). The final model explained 9.2% of the within-school variance for SRH, and 37.6% of the between-school variance in SRH.

The only student-level variable that had a random relationship with SRH was neighbourhood. The relationship between neighbourhood and a student’s SRH was steeper in schools with more crowded classrooms ($\gamma = 0.02$, $p < .05$). The relative association between a student’s neighbourhood and his or her SRH was greater in schools with higher student-teacher ratios. This finding suggests that lower student-teacher ratios may ameliorate the relationship between neighbourhood and SRH and could potentially have a protective effect on students from poorly rated neighbourhoods.
Table 2

*Final models containing student and school variables associated with health outcomes*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Self-rated Health</th>
<th>Life Satisfaction</th>
<th>Emotional Wellbeing</th>
<th>Subjective Health</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student-level variables</strong></td>
<td>β (SE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-0.20 (0.03)</td>
<td>-0.13 (0.02)</td>
<td>-0.26 (0.03)</td>
<td>-0.36 (0.03)</td>
</tr>
<tr>
<td>Family structure</td>
<td>0.05 (0.02)</td>
<td>0.16 (0.02)</td>
<td>NS</td>
<td>0.10 (0.03)</td>
</tr>
<tr>
<td>Family wealth</td>
<td>0.14 (0.02)</td>
<td>0.23 (0.01)</td>
<td>0.05 (0.01)</td>
<td>0.14 (0.01)</td>
</tr>
<tr>
<td>Acad. achievement</td>
<td>0.14 (0.01)</td>
<td>0.17 (0.01)</td>
<td>0.12 (0.02)</td>
<td>0.11 (0.01)</td>
</tr>
<tr>
<td>Neighbourhood</td>
<td>0.26 (0.02)</td>
<td>0.33 (0.01)</td>
<td>NS</td>
<td>0.20 (0.02)</td>
</tr>
<tr>
<td><strong>School-level variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student problem behaviours</td>
<td>-0.03 (0.00)</td>
<td>-0.02 (0.01)</td>
<td>NS</td>
<td>-0.03 (0.01)</td>
</tr>
<tr>
<td>Student aggression</td>
<td>NS</td>
<td>NS</td>
<td>-0.02 (0.01)</td>
<td>NS</td>
</tr>
<tr>
<td>Socioeconomic standing</td>
<td>NS</td>
<td>0.08 (0.03)</td>
<td>0.07 (0.02)</td>
<td>NS</td>
</tr>
<tr>
<td>Academic standing</td>
<td>NS</td>
<td>-0.07 (0.03)</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Intercept variance component</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tau</td>
<td>0.012</td>
<td>0.026</td>
<td>0.027</td>
<td>0.043</td>
</tr>
<tr>
<td>Sigma²</td>
<td>0.892</td>
<td>0.730</td>
<td>0.891</td>
<td>0.834</td>
</tr>
<tr>
<td><strong>Proportion of variance explained</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student-level</td>
<td>9.2%</td>
<td>18.9%</td>
<td>2.3%</td>
<td>10.3%</td>
</tr>
<tr>
<td>School-level</td>
<td>37.6%</td>
<td>13.3%</td>
<td>18.2%</td>
<td>14.0%</td>
</tr>
<tr>
<td>Deviance statistic</td>
<td>16883.3</td>
<td>15718.0</td>
<td>16920.72</td>
<td>16556.0</td>
</tr>
</tbody>
</table>

NS: Non-significant
Life Satisfaction. Approximately 98% of the variance in students’ Life Satisfaction (LS) was found to be between students and just 2% was between schools. All five student-level predictors were significantly associated with LS. Higher levels of LS were associated with better perceptions of one’s neighbourhood ($\gamma = .33, p < .01$), higher family wealth ($\gamma = .23, p < .01$), higher academic achievement ($\gamma = .17, p < .01$), living with both parents ($\gamma = .16, p < .00$), and being a boy ($\gamma = .13, p < .01$). LS was significantly associated with a school’s socioeconomic standing, student problem behaviours, and a school’s academic standing. A student’s LS was significantly higher in schools with higher socioeconomic standing ($\gamma = .08, p < .05$) but lower in schools with higher academic standing ($\gamma = -.07, p < .05$), and higher problem behaviours ($\gamma = -.02, p < .01$). The final model explained 21% of the within-school variance for LS, and 36% of the between-school variance.

Two student-level variables, family structure and academic achievement, had a random relationship with LS. When modeled with the school variables, the positive relationship between one’s family structure and LS was steeper in schools with higher levels of student aggression ($\gamma = 0.03, p < 0.01$). This finding suggests that a student’s family structure had a stronger effect on his or her LS in schools with higher levels of student aggression. In contrast, students in schools with lower levels of student aggression reported more similar levels of LS despite their family structure. It is possible that schools with lower levels of student aggression are able to reduce the LS gap for students from single-parent homes. When modeled with the school variables, the positive relationship between one’s family structure and LS was reduced in schools with higher
academic standing ($\gamma = -0.07$, $p < .01$), suggesting that a school’s academic standing has an ameliorating effect on the relationship between family structure and LS.

On the other hand, the association between students’ academic achievement and their LS was lower in schools with higher socioeconomic standing ($\gamma = -0.04$, $p < .05$). Thus the gap in LS between high and low achievers is reduced as the school’s socioeconomic standing increases, also suggesting that a school’s socioeconomic standing has an ameliorating effect on the relationship between academic achievement and LS.

*Emotional Wellbeing.* Approximately 96% of the variance in students’ Emotional Wellbeing (EWB) existed between students and just 4% was between schools. Three student-level predictors were significantly associated with EWB. Higher levels of EWB were associated with higher academic achievement ($\gamma = .12$, $p < .01$), family wealth ($\gamma = .05$, $p < .01$), and being a boy ($\gamma = .26$, $p < .05$). Students in schools with higher socioeconomic standing reported higher individual levels of EWB ($\gamma = .07$, $p < .01$), while higher student aggression was associated with lower levels of EWB ($\gamma = -.02$, $p < .00$). The final model explained 2.3% of the within-school variance, and 18.2% of the between-school variance in EWB.

One student-level variable, academic achievement, had a random relationship with EWB. The gap in students’ EWB associated with academic achievement was diminished in schools with problem behaviours ($\gamma = -0.01$, $p < .05$). Thus, in schools with student problem behaviours, academic achievement was not as strongly associated with EWB as in schools with less problem behaviours. The positive association between academic achievement and EWB was also reduced in schools with higher academic standings ($\gamma = -
While such schools likely have fewer lower achieving students, it is also possible that such a school culture helps to reduce the gap in EWB that would normally be associated with individual student achievement.

**Subjective Health Complaints.** Approximately 96% of the variance in students’ Subjective Health Complaints (SHC) occurred between students and 4.3% of the variance was between schools. All five student-level predictors were significantly associated with SHC. Higher levels of SHC were associated with better perceptions of one’s neighbourhood ($\gamma = .20, p < .05$), higher family wealth ($\gamma = .14, p < .01$), higher academic achievement ($\gamma = .11, p < .01$), living with both parents ($\gamma = .10, p < .05$), and being a boy ($\gamma = .36, p < .05$). SHC was significantly associated with a school’s socioeconomic standing and student aggression. A student’s SHC was generally higher in schools with higher socioeconomic standing ($\gamma = .07, p < .01$), but lower in schools with higher levels of student aggression ($\gamma = -.02, p < .01$). The final model explained 10.3% of the within-school variance and 14% of the between-school variance in SHC.

Two student-level variables, gender and neighbourhood, had a random relationship with SHC. When modeled with the school variables, the gap between gender and SHC was greater in schools with higher levels of problem behaviours ($\gamma = -0.03, p < .00$) and higher socioeconomic standing ($\gamma = -0.07, p < .05$). Girls reported relatively lower levels of SHC in schools with higher problem behaviours, suggesting that such a climate may more negatively impact girls’ SHC than boys’ SHC. Furthermore, increases in the schools’ socioeconomic standing were also associated with higher gender gaps in SHC. It would appear that boys’ SHC obtains more of a benefit from increasing socioeconomic status in a school than girls. Lastly, the positive relationship between
neighbourhood and SHC was stronger in schools with a positive school climate ($\gamma = 0.22$, $p < .05$) indicating that the gap between students from poor and good neighbourhoods increased as the school climate increased. Again, this result suggests that students from better neighbourhoods receive more benefit in terms of their SHC from a positive school climate than those students from poorer neighbourhoods. Alternatively, a negative school climate could reduce the positive association between one’s neighbourhood and an individual’s SHC.

Discussion and Implications

The question of whether, and how, schools make a difference to students’ educational achievement, behaviour, or health continues to occupy researchers, policy makers, and practitioners (Kirk, 2006; West, Sweeting, & Leyland, 2004). The HBSC provides a mechanism to examine the relationships amongst student health and wellbeing measures and schooling in Canada. The findings illustrate that there are both individual- and school-level factors that affect students’ health. Important student factors included gender, family wealth, family structure, academic achievement, and neighbourhood, explaining between 9.2% and 21% of the individual-level variance in Self-rated Health (SRH), Life Satisfaction (LS), and Subjective Health Complaints (SHC). These student factors were much less associated with Emotional Wellbeing (EWB), with gender, family wealth, and academic achievement accounting for only 2.3% of the individual level variance. Not surprisingly, better health outcomes are associated with increased family wealth, two-parent families, and higher levels of student achievement. There was also an important association with the quality of one’s neighbourhood and reported health outcomes. Nevertheless, these findings also suggest that these particular factors constitute
only a small proportion of the constellation of individual components associated with students’ health outcomes. As an example, there are likely underlying psychological and emotional factors that are not explained by social-demographic factors that impact students’ health perceptions.

The study was particularly interested in the associations amongst school factors and individuals’ health outcomes. There are modest, but statistically significant, differences in the four health outcomes across schools, accounting for 2% to 4% of the total variance in SRH, LS, EWB, and SHC. Hence the health and wellbeing outcomes of adolescents are associated with both individual-and school-level variables (see also Gilman & Huebner, 2006; Greenspon & Saklosfske, 1997). From a HPS perspective, identifying school factors that are associated with health in its broadest sense implies that these factors could be the target of HPS initiatives. Four school-level factors were associated with the four health outcomes. Students’ reported LS and EWB were higher in schools having wealthier populations. Of importance, this school-level effect was in addition to an individual’s own self-reported family wealth. Hence these students not only benefited from their own personal situation but also from the school culture created by schools serving such a population (Willms, 2004). In contrast, an increased presence of problem behaviours in a school was associated with lower levels of reported SRH, SHC, and LS. More problematic behaviours (Aggression) were associated with lower levels of EWB. These findings extend previous research that has linked a school’s discipline climate to academic and non-academic outcomes (Ma, 2000; Ma & Klinger, 2000; Ma & Willms, 2004).
The negative association between a school’s academic standing and students’ LS is more difficult to justify. One possible explanation could be the pressures that students identify when there are high expectations in the school for achievement. The different associations for both student aggression and problem behaviours are also intriguing and worth further exploration. The aggression scale could be a proxy measure of school location (Palardy, 2008). In contrast, problem behaviours could reflect what Raudenbush and Willms (1995) call Type B effects, which are factors associated with school operation and functioning (see also Willms, 1992).

Lastly, random associations amongst the student-level variables and reported health outcomes were identified. These random effects indicate that the relationships between these student variables and health are not consistent across schools. Further, there appears to be school-level factors that either ameliorate or exacerbate these relationships. For example, students from less advantaged neighbourhoods were found to be at an even greater disadvantage in schools with more crowded classrooms. Similarly, these students did not seem to gain as much by the positive benefits associated with more positive school climates. This finding corroborates other research (see Anderman, 2002) that suggests when “a school environment is perceived of as supportive by many of its students, that supportive environment may be related to problematic psychological outcomes for those students who do not feel supported” (p. 806).

The findings suggest that low achievers are emotionally vulnerable in schools with high academic standing possibly because they cannot keep up academically with their peers, and also fare worse in schools with high levels of problem behaviours, suggesting the importance of providing emotional as well as academic support for
students struggling academically in such schools. On the other hand, students who do not live with both parents benefited from being in schools with high academic standing and low aggression, where they reported higher levels of Life Satisfaction. It is possible that a positive school culture that exhibits low student aggression and one with high academic expectations provides opportunities for meaningful relationships and high expectations for students from single-parent families.

The relatively lower health outcomes by girls are also consistent with previous research. In particular, the negative associations between poorer school climates and health are greater for girls (see Gillander-Gådin & Hammarstrom, 2003). Yet the associations between girls and health outcomes illustrate the complex underlying interactions that occur amongst student and school factors. As an example, schools having higher socio-economic levels were associated with larger SHC gaps between boys and girls (see also Vuille & Schenkel, 2001). Such differential relationships across schools are important to examine, and findings of this analysis highlight potentially important interactions that bear further examination and study.

One of the ongoing challenges of the HBSC surrounds the sampling of students. Permission procedures tend to reduce the number of students from disadvantaged situations. Hence it is likely that both the student-level associations and the between-school differences are actually underestimates of the actual situation. Similarly, the short principal survey encouraged participation but resulted in relatively general contextual variables that might be too narrow to adequately portray school functioning. Moreover, school administrators might be reluctant to report sensitive school characteristics thus compromising the validity of a survey in collecting pertinent school-level data.
The findings also highlight the need to develop alternative models of data collection that both include students from the entire spectrum of the school population, and also capture changes that occur over time in a school. Cross-sectional data, as used in the HBSC, make it difficult to establish the baseline levels (Aveyard et al., 2005) that are required to make causal inferences associated with school processes. Subsequent longitudinal data collection methods will better clarify the likely complex role of these school processes that have been identified.

The practices and procedures in a school impact students’ health outcomes. Further, these school processes alter the relationships amongst student factors and their reported health outcomes. However, as Scheerens and Bosker (1997) note, and findings of this study corroborate, explanatory variables may together have a complex effect on the outcome measures (see also Duncan, Jones, & Moon, 1998). The associations between a student’s neighbourhood and student health outcomes are particularly intriguing. These findings suggest there may be overlapping effects of schools and neighbourhoods (see also Brännström, 2008) on students’ health and wellbeing outcomes, and these effects likely interact with individual factors, school composition, and school processes.

Ongoing attempts to identify the relationships amongst individual and school factors and student outcomes continue to challenge researchers. As suggested by Palardy (2008), “while inputs and processes both impact outcomes directly, processes may also mediate or moderate the effects inputs have on outcomes” (p. 25). While it is easier to change school processes than to change individual and family conditions (LeBlanc, Swisher, Vitaro, & Tremblay, 2008), it may be possible for schools to address the
compositional effects resulting from the neighbourhoods in which they are located. As such, it becomes imperative to discern how schools can not only address the compositional effects emanating from the neighbourhoods in which they are located, but also their own organisation, climate, and processes in an effort to enhance students’ health and wellbeing.
CHAPTER IV: THE HEALTH PROMOTING SCHOOL:
TWO CASE STUDIES IN ONTARIO

Introduction

Let us rethink school health away from kits and projects to solve problems and use the school as an ongoing setting where health is created, supportive environments are built, partnerships made and many skills learned. Then we might be able to say this is what school communities can realistically do to build the health and wellbeing of their students now, and into the future. (St. Leger, 2000, p. 408)

St. Leger’s words echo the calls for a social ecological approach, grounded in a contextual oriented view (Stokols, 1992) and a collective responsibility (Tones, 1986) towards health and wellbeing. A social ecological approach acknowledges the impact of wider environmental determinants on health (Poland, Green, & Rootman, 2000) and asserts that health is not defined solely by individuals’ “risk identities” but by the relationship that exists between people and their settings (Kickbusch, 1995). From a health promotion perspective, a setting has been defined as a place or social context where people engage in daily activities and in which environmental, organizational, and personal factors interact to affect health and wellbeing (Nutbeam, 1998). Accordingly, the health of individuals is not to be treated in isolation from the larger social units in which they live and work (Stokols, 1992, 1996).

The application of these principles to health promotion in a school setting has become known as Health Promoting Schools (HPS) (World Health Organization (WHO), 1996a). The underlying principles of HPS are that schools can have a positive effect on children’s health and wellbeing. The recognition of schools as one of the settings that shape student health requires a shift in how health promotion is done from an individual-level intervention to a whole school change program that includes individual and
institutional components (Allensworth, 1995; Bond et al., 2004). This shift also entails the cooperation of individuals and groups acting at different levels for health promotion to be successful (Dooris 2005; Green & Kreuter, 1990; Stokols, 1992, 1996).

Moreover, HPS embrace a holistic view of health that includes the physical, social, mental, and emotional wellbeing of students (Allensworth, 1995). Such an encompassing view of health requires comprehensive and coordinated programs rather than categorical short-term interventions, by encouraging the health and education sectors to work together to develop the health attributes of students (St. Leger, 2000). Schools that aspire to be health promoting schools (HPS) are required to adopt a set of guidelines (WHO, 1996a) that include establishing school health policies, developing programs that promote health, and extending teaching beyond health knowledge and skills to also encompass the school’s social and physical environment and its organisational practices. Additionally, these schools are also expected to establish links with community and partner organisations to create “a total context that is conducive to health and where not only the physical environment but the ethos and relationships provide a climate conducive to positive health and wellbeing” (Weare, 2001, p. 9). While these guidelines have been represented in theoretical frameworks, there is little written on their implementation, application, and practice (Inchley, Currie & Young, 2000; Inchley, Muldoon, & Currie, 2007). As such, understanding implementation at a practical level is essential for schools intent on becoming HPS.

Program Implementation

Rumberger and Palardy (2004) suggest the most promising research for understanding and improving student performance is exploring and understanding how
schools are organised and managed, their teaching practices, and the various policies that affect the social and academic climate schools create for students. The same logic can be applied to understanding HPS models given that a HPS is regarded as a process in itself (Jensen & Simovska, 2002). The tools for evaluating the implementation of HPS can then identify the processes by which schools can be more effective as health-promoting institutions, and the factors that influence these processes (Tossavainen, Turunen, & Vertio, 2005).

School effectiveness research identifies four factors that underlie successful implementation of school reform. These individual and organisational factors include principal support, allocation of resources, formalisation of a plan into policy, and teacher commitment (Elias, Zins, Graczyk, & Weissberg, 2003; Fullan, 2007; Hill, 1997). Additionally, assessments of HPS initiatives in Europe (see Denman, 1999; Inchley, Currie, & Young, 2000; Inchley, Muldoon, & Currie, 2006) have identified a range of factors that are essential for their successful implementation. A compilation of these set of factors, described as process indicators, includes:

1. Leadership and management
   a. Active involvement and support of school management
   b. Appointment of a school-health committee or coordinator with allocated time and resources
2. Ownership and empowerment
   a. Training and support for school staff
3. Collaboration
a. Partnership working with external professionals and multiagency steering groups
b. Involvement of teaching and non-teaching staff in health promoting activities
c. Development of cross-level school links
d. Student engagement and active student participation in decision-making processes
e. Parental and community involvement

4. Integration

The extent to which the criteria for implementing HPS are adhered to and the conditions for successful school reform vary from one context to another. Policymakers, implementers and stakeholder groups tend to have different interpretations of the policy language, legislative intent, and implementing actions associated with programs and interventions (Grin & Van de Graaf, 1996). Their ideas and theories have to be brought “to light” to reach a consensus on what a program or an initiative looks like (Weiss, 1997). In many cases, the “active ingredients” required for initiatives to be implemented are usually not outlined by program developers (Elias, Zins, Graczyk, & Weissberg, 2003, p. 310). Hence bringing to light the active ingredients that are required for the implementation of HPS initiatives, the conditions for implementation, and the broader context within which specific actors are involved have implications for the practice and evaluation of HPS initiatives. Equally important is identifying the network of actors involved in planning, financing and delivering services, and the examination of their goals and strategies (Hjern & Porter, 1981; Sabatier, 1997). This process not only reflects the logical reasoning and assumptions held by practitioners, but also provides an
understanding of how program clients or intended beneficiaries comprehend the program (Rogers, 2007). Additionally, there is a need to examine the ways schools translate HPS principles into practice, and the resulting changes to the organisational structure and conditions (Greenberg et al., 2001; Wold, 1999). The current study set out to generate a model of such a system (Dooris, 2005) and to develop an understanding of how HPS principles are implemented in practice by mapping and understanding the relationships, interactions, and synergies within and between different groups involved in implementing HPS initiatives.

Health Promoting Schools in Ontario

The formalisation of physical activity in elementary schools as one component of HPS happened in 2005. As part of its Healthy Schools Plan, the Ontario Ministry of Education (MOE) legislated “20 minutes of sustained moderate to vigorous” daily physical activity (DPA) for elementary students in the province. This legislation was supported by resources developed in partnership with the Ontario Physical and Health Education Association (OPHEA) and was accompanied by changes to the Health and Physical Education Curriculum for students in Grades 1 to 8 (MOE, 2005). The MOE also developed a blueprint for Healthy Schools in 2006. The Foundations for a Healthy School document addresses four components: (a) high quality instruction and programs, (b) a healthy physical environment, (c) a supportive social environment, and (d) community partnerships. The two-page document lists health-related topics within each component that schools are encouraged to consider in the process of becoming healthier schools.
While there are no particular details specified as to how schools should implement these changes, the MOE (2006), through its website, states that “schools must commit to implementing at least one more activity/program to make their students and schools healthier.” Through its school recognition program, the Ministry posts the accomplishments of schools in relation to each of the various components identified under the healthy schools banner. This recognition program is considered an important way to get information out to other schools and leverage change throughout the education system (Adelman & Taylor, 2003).

In Europe, national networks for health promoting schools are responsible for the integration of HPS principles and initiatives into school policies and activities, while at the school level, local coordinators facilitate a needs assessment, the development of objectives and activities, and their implementation (Samdal, 1999). Currently, Ontario does not have such a network of health promoting schools to support the implementation of HPS initiatives. Moreover, there is no evidence that the establishment of school health committees has occurred in schools, except in a few boards (MacDougall, 2004). Furthermore, the demonstration projects highlighted on the MOE website are generally locally designed projects that vary in their range of implementation. To trace the process of development and implementation of HPS initiatives within schools, the current study explored the processes involved in the adoption of HPS principles, identified the progression of becoming a HPS, and established an implementation model of HPS in Ontario. The following research questions were addressed:

1. What does a health promoting school look like?
2. What are the perceptions of students, teachers, and administrators regarding what constitutes a HPS?

3. What are the key elements at the structural and organisational levels that need to be in place to allow a HPS to work most effectively?

A case study methodology was most suited to address these research questions since it provides a closer and deeper look at how a program is working and being implemented, while highlighting ongoing challenges and barriers. In addition, case study research allows the generation of rich data from which explanations can be developed (Miller, 1997; Thurston, 2006), and the triangulation of data from a variety of sources can be established to enhance the validity of the findings (Inchley, Muldoon, & Currie, 2006).

A group of stakeholders from school boards and health units who were involved in healthy school initiatives were invited to serve as an advisory group for the study. This participatory approach helped to generate the research questions, and resulted in an increased interest in a study they helped shape. Purposeful sampling provides the opportunity to examine information-rich cases for in-depth study and increases the quality of data obtained from fewer participants (Patton, 1997). The stakeholders identified two schools (K-8) in two school boards that were actively engaged in school health promotion activities and were identified as being particularly successful healthy schools.

Parkway School, in the Parkway School Board, is located close to downtown in a small city with a population of approximately 20,000. The school serves approximately

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4To ensure confidentiality, pseudonyms will be used to refer to the names of the schools and school boards. Pseudonyms will also be used in direct quotes to fully protect the identity of participants.
350 students from Junior Kindergarten to Grade 8, mostly from lower to middle income families. Highbrook School, in the Highbrook School Board, is located in a suburb of a medium size city with a population close to 130,000. The school serves approximately 700 students from Junior Kindergarten to Grade 8, mostly middle to high-middle income, and has an extended French immersion program. Highbrook School, with a more affluent parent composition, was able to generate more funds through individual donations and more ambitious fundraising efforts. As a result, the school had a state of the art playground that was beautifully landscaped, with each section dedicated to a specific sport and school grade.

Method

Case studies of socially organised settings require data collected through multiple methodological techniques (Miller, 1997). Hence data were collected through focus groups with teachers and semi-structured interviews with school administrators (principals and vice-principals). Data for this study were obtained from a school health conference organised by one of the boards, and a two-hour school observation of playgrounds and recreational areas at each school. The second round of data collection consisted of semi-structured, individual interviews with four key informants. Key informants included two representatives from education and two from health who were actively engaged in developing, planning, and implementing HPS initiatives in their respective jurisdictions. Concepts derived from early stages of data analysis and questions that emerged about those concepts were used to inform and “drive the next round of data collection” (Corbin & Strauss, 2008, p. 144). These semi-structured interview questions were revised after the data analysis for the other groups was
completed. These questions became more specific to saturate categories and themes, probing into the organisational and support features within each board.

In total, data were obtained from four female key informants; four administrators: three females and one male; 8 female and 2 male teachers. The teacher focus groups lasted approximately one hour and the interviews occurred over a 60- to 90- minute session during the regular work day. All focus groups and interviews were recorded and transcribed. Twenty-four Grades 6 to 8 students were also interviewed in focus groups. While their input was valuable for understanding their impressions of the impact of the schools’ efforts, they were unable to provide direct information regarding the implementation model. Hence their data were only used in this study to corroborate our findings about the implementation. Subsequent research will focus more closely on the students’ voices. Thematic analysis was done in two stages using ATLAS.ti 5.0; first within each school and then across the two schools and boards, with the latter serving as the basis for the examination of different models of implementation of HPS and the development of indicators of the implementation of HPS initiatives.

These case studies demonstrate how the notion of HPS has been adapted in these school boards, and present the processes and organisational changes that were undertaken. I attempted to characterise these two HPS initiatives and describe the features of the two schools, and associated activities and outcomes. In addition, I wanted to develop an understanding of how the healthy schools policies are being interpreted, adapted, and implemented. The different perspectives and emphases across projects enabled me to better define what makes a HPS, and to map out common and unique views of the identified themes and how they contribute to the development of HPS. The
stakeholder perspectives across cases together make it possible to begin to establish an inclusive operational implementation model of what makes a HPS.

Results

The results of the interviews and focus groups reflect the progression of adoption of HPS in the two school boards, starting with the formalisation of HPS into policy at the board level, and the required allocation of resources. Next, themes related to implementation at the school level are presented. These include leadership and management, ownership and empowerment, integration, and collaboration. The results also highlight the challenges to the implementation of HPS initiatives. Direct quotes are provided to illustrate the commonly expressed views of participants, or to present unique but potentially important or insightful perspectives.

Formalisation of HPS into Policy

The Parkway School Board. The HPS project in the Parkway School Board was part of a wider strategy to develop healthy schools. It was spear-headed by a Physical and Health Education (PHE) curriculum coordinator. He established a partnership with the local health unit in 2002. A healthy school consultation committee was established, including representatives from the health unit, board of education, health agencies (Canadian Cancer Society, the Heart and Stroke Foundation), and the community. The different perspectives provided a way to identify needs and a shared understanding of a healthy school. This process led to the creation of a strategic initiative to move forward and a HPS blueprint was created, which included a set of policies, guidelines, a resource kit, and an executive committee (PHE curriculum coordinator, the school health manager from the health unit, physical health and education teachers, school-level coordinators,
and members of stakeholder groups). The HPS executive committee was responsible for strategic planning and overall management of the initiative and was seen as a way to bridge service divisions, allowing the participation of key stakeholders in decision making. Currently, the school board has a dedicated and funded position for 1 full-time PHE curriculum coordinator who is also responsible for healthy schools, and a half-time position for a resource person who provides training to teachers at schools and oversees implementation of the daily physical education requirements.

The HPS executive committee is co-chaired by the PHE curriculum coordinator and the manager of the school health team at the health unit. The HPS executive committee conducts monthly meetings to develop action plans and organise HPS activities within the board and schools. The committee also organises two conferences each year in its board that bring teachers, health professionals, and other stakeholders together.

Teachers who are members of the HPS executive committee are considered middle system leaders or school facilitators. In addition to teaching full-time, they each oversee a group of five to six schools including their own school. The duties of the facilitators include sharing the communiqués from the HPS executive, seeking resources, and providing support to move through the process of becoming a HPS. Each facilitator is given six days of release time each year to work with his or her schools, attend conferences, and manage administrative details. The Health Unit provides two half-time school health nurses who support health promotion programs in schools. The program budget also provides in-kind contributions for office supplies and use of facilities.
The Highbrook School Board. The Highbrook School Board created a HPS coordinator in response to the Ontario Ministry of Education (MOE) daily physical activity (DPA) legislation in 2005. The purpose was “to get all schools to a high level of DPA implementation” (Leslie, key informant interview). A physical and health education teacher, who saw a need for coordinated efforts among schools around physical and health education policy, became a champion for the initiative work. A healthy living committee was established, comprised of educators, principals, school board administrators, community partners, and school health nurses from the public health unit. According to Leslie, the need for leadership and support for implementing DPA across schools led to the creation of a full-time position at the local health unit for a Physical Education Specialist (PES). The teacher who was the champion of the school-board initiative was seconded to the health unit. This arrangement had the advantage of giving schools external support from an individual who fully understood the challenges the schools were facing and would be able to produce tangible action plans. The position receives 0.75 of its funding from the health unit (HU) and 0.25 from the school board.

This PES attends the curriculum departmental meetings at the board once a month to provide updates on the activities taking place in schools and in the MOE. The purpose of monthly HPS committee meetings is to share information, receive updates from the PES on new programs from organisations (e.g., OPHEA), and share resources. The committee does not assume a management responsibility but serves as an advocacy group, promoting the activities of its members. In addition, the manager of school health programs at the health unit acts as the liaison between the health unit and the school board administration, oversees all the school health nurses with their different capacities,
and meets with superintendents and board directors monthly to respond to requests by schools for other health promoting activities.

Leadership for the HPS initiative is located at the health unit but funding to schools is channeled through the school board to participating schools. Schools interested in becoming a healthy school have to demonstrate their engagement in a health promoting activity and outline a plan of action. Funding is contingent on creating a strategic framework for planning and delivery to expand school activities. Improved physical activity is considered a conduit for health improvements through increased student participation. The schools can then proceed to address other health interventions.

Both school boards had established and dedicated supervisory, management, and support structures that were responsible for allocating human and financial resources. The coordinating committee for the HPS in the Parkway School Board was a more formalised decision making group that included multiple stakeholders and facilitators. In contrast, the focal point for supporting the HPS at the Highbrook School Board was largely the PES seconded to the health unit who acted as a coordinator with support from school health nurses. In both cases, the coordinating committee and coordinator were seen as “change agent positions” (Adelman & Taylor, 2003, p. 22) recognised as vital for implementing healthy school initiatives. These agents were particularly valued by teachers who saw the importance of healthy schools initiatives but did not have the personal capacity to implement them. The coordinators:

1. Articulated the HPS policies and developed the required resources.
2. Provided the transfer and exchange of knowledge gleaned from membership in professional groups, and presence at school health conferences.
3. Attracted and coordinated funding for the teacher professional development of wellness days, workshops for student leaders, and purchase of school sports equipment.

4. Provided specialist expertise and teacher support.

5. Liaised among the health unit, school boards, and schools.

6. Reduced the management burden on existing leadership teams in schools who were still involved in their regular teaching and administrative responsibilities.

7. Helped schools network with other schools having more experience implementing HPS initiatives.

8. Established links to community groups, agencies, and HPS programs in other jurisdictions.

Despite the outlining of roles and responsibilities of the coordinators, the establishment of board-level policies and organisational restructuring and development of guidelines and blueprints are necessary but not sufficient conditions for successful implementation at the school level. Change at the school level generally requires the leadership and resourcefulness of key local individuals (Hatch, 2000). Moreover, success of the implementation of initiatives also depends on the delivery system into which initiatives are introduced (Elias et al., p. 308). Becoming a HPS was seen as a product of a set of factors that helped shape the delivery system, in this case the school, and how it operated. Common themes emerged from the data. These themes were interwoven into participants’ responses, and were recognised as key to the success of the HPS initiatives at their schools.
Implementation at the School Level

Leadership and Management. An important responsibility of school administrators revolves around organising and structuring the operations in the school with the goal of achieving effectiveness and efficiency (Bolman & Deal, 1991). School administrators in the case studies demonstrated an organisational commitment and understanding of HPS, fostering leadership and advocacy within the school. These administrators also enabled access to skilled health promotion specialists who provided ongoing assistance in developing competencies and capacities of school staff. The principals at each of the schools were credited for being the main driving force behind the HPS initiatives, by providing direction, a key strategy for the implementation of new initiatives. They were described as dynamic individuals who had the belief and motivation to make their vision a reality:

He tends to be an agent for change in the sense that he knows how to bring people together and say I’ve heard what you said and I’ve heard what you said and now here I’m going to share with both of you what you’re saying and here’s the common message. (Marnie, Grade 8 teacher)

Teachers felt that their input and ideas were valued and taken into account throughout the process. The administrators used a collaborative approach to create a more horizontal form of leadership and foster a sense of community. In the words of Karen, a Grade 6/7 teacher, “because of [the principal] there is this whole sense of we’re in the big picture together, it’s not just admin here and staff here and then teachers.” Furthermore, the administrators at the school were recognized for guiding the HPS movement. Alignment of goals around common and shared core beliefs (Sabatier, 1991) at the school and board levels, through creating a HPS coordinating committee as was the case at the Parkway Board, or a coordinating position as was the case at the Highbrook
Board, were credited for being able to shape the organisational conditions that were necessary for adopting the principles of HPS and creating a coherent message. Kristen, a Grade 8 teacher, acknowledged the important role of the PHE coordinator and the school board as a whole stating, “we just have a really strong group of core people I guess at the board office level and then it trickles down.”

Ownership and Empowerment. The executive committee in the Parkway School Board recognized that adopting HPS initiatives requires a cultural change, but selling it as such would be overwhelming and akin to setting schools up for failure. Accordingly, the committee broke down the notion of HPS into three core pillars: (a) school environments; (b) curriculum delivery; and (c) supports and services. Schools were given the flexibility to choose the pillar they wanted to focus on. For example, Parkway School focused on supports and services, vis à vis student participation and leadership, as one of its first priorities. The school created a school health committee and developed a plan to increase student participation through newly created clubs, student committees, and intramural activities. According to Carmen, the school administrator at Parkway, the school boasted an improvement in student morale, feelings of ownership, and pride in their school. As an example, within the span of four years, the school had 75 students organising leadership committees and activities compared to only eight students at the inception of the program.

To promote ownership of the HPS initiatives at both schools, principals undertook a needs analysis and a school-wide consultation. The consultations enabled the school community to help shape the course of the HPS initiative. As expressed by George, an administrator at Highbrook School, “we did a big brainstorm as a staff, students, and
parents. They came up with all the things they wanted to see in their schoolyard.” The process also included community partners, and it enabled the principal to identify the needs and the activities that students and staff envisioned would meet their requirements. Ownership among students was facilitated by providing them with opportunities for decision making and taking responsibility for those decisions. As one teacher explained:

    He instilled this program of adopt a yard, so each class has now adopted a portion of the yard and it’s their responsibility to look after it and care for anything that’s happening in that part, so it’s really given the kids a sense of ownership and pride. Like my kids own the front and if they start seeing the tulips growing which they’re going to start in the next couple of days they’re going to tell me it’s time to come out and trim the tulips. (Marnie, Grade 8 teacher)

*Integration of HPS Initiatives.* There was a general agreement that schools could not be effective in achieving their educational goals if they perceived their fundamental role too narrowly. Rather, student achievement was considered to be closely tied to social and health issues such as opportunities for personal development, social interaction, participation, and engagement that could not be entirely provided by the formal curriculum, but could be through HPS initiatives. Administrators at both schools considered the HPS as an antidote to the narrowing of educational goals singularly focused on achievement, and a way of educating the whole child. HPS initiatives were not seen to create dissonance within schools but as new continuities within the schools’ existing frameworks (see also Hatch, 2000). Elements of HPS were considered to be part and parcel of continuous improvement “without excessive divergence from what exists” (Elias et al., 2003, p. 314).

A HPS was not regarded as a discrete activity, but rather as a way of being that pervaded all aspects of school life and linked to the core objectives of the school. In this manner, becoming a HPS was not regarded as a set of tasks that had to be checked off a
list but as a wide-ranging school initiative that permeated the fabric of the school and appeared to be an integrated part of a whole-school effort:

It’s more about a culture and how that school is to live, work, and play, it’s a feel of a school, it’s how you connect with people, and every decision they make in that school is done so with health in mind. (Norah, Key Informant)

Hence the underlying goals at both schools were essentially the same, and a shared basic understanding that a HPS is not just about physical activity, as some might assume, but about addressing the multiple needs of students and creating a school culture that would address barriers to learning through the healthy development of the whole child. “They’re all elements of the same package, a healthy school, a healthy body, a healthy mind, put together and you have the healthy student” (Carmen, Administrator).

A common thread running through these understandings is that HPS are essentially initiatives that relate directly to the core business of schools in enabling children to become healthy, well adjusted learners. As Paul, a Grade 8 teacher, commented:

But we’re here to try to make, you know, positive citizens for the future by giving them a whole skill set for being responsible and useful citizens for the future and part of that means giving them a sense of wellness.

Administrators believed the various interest groups at the schools were united under the banner of a HPS, but realised that what was required was the need to establish a common school vision and to orchestrate the goals of the diverse committees that were in place. Not only was bringing the groups together to the table important for achieving a shared plan, so was coordinating the various agendas in an efficient manner:

We developed one plan for the whole school that would kind of dovetail everything in together because by changing the landscape of a school I really do believe you transform the culture of everybody at the same time. (George, Administrator)
As an example, the yard facilities at Parkway School limited active engagement for students during recess. Hence the integration of HPS activities and initiatives into the school required accommodations to the school schedule. The school moved to a balanced school day with two 40 minutes of recess time that gave students more time out to play. This schedule resulted in students being more engaged during recess rather than just being idle. Play and games were further encouraged by providing each grade with a bucket containing exercise equipment and balls.

**Collaboration and Partnerships**

*Interagency Collaboration.* Interagency collaboration involved joint meetings, discussions, planning, and professional development. Key informants reported increased visibility across sectors, highlighting the contributions of each, improved communication channels, increased opportunities for joint decision making, and enhanced capacity to secure resources. The existing collaboration between the health units and the school boards was highlighted by key informants as one of the key factors for the success of the partnerships that were developed, in line with similar research suggesting that “most effective inter-agency work results from teams where individuals already have a history of working together” (Milbourne, Macrae, & Maguire, 2003, p. 32). Moreover, the successes of the partnerships were attributed to a gradual and sustained process of trust-building where both partners worked closely to understand each other’s aims, priorities, and working styles. The processes were not always straightforward because of the competing pressures the different sectors faced. Thus it was important that these partnerships had ample time to develop through a series of progressively small-scale activities.
Although the point of delivery for activities was generally the schools, there were examples of joint health-education initiatives that extended beyond the school boundaries where both worked together to plan local strategies such as wellness days and health focused one-day camps for students. For example, at one of the bi-annual conferences, school health nurses worked closely with teachers to help them interpret nutritional information on food packages and relate this information to Canada’s new food guidelines, an exercise that would support the changes to the nutrition guidelines in schools.

*Teacher Collaboration.* A context of collaboration and commitment was established in both schools through a dialogue with teachers while introducing the HPS initiatives. As a consequence, establishing a HPS team at the school level that met monthly was essential to align teacher and school efforts, to establish a plan for concrete activities, and to maintain the school focus (Daft, 1999; Donaldson, 2001). Moreover, a climate of openness in communication among teachers and a positive attitude towards change were viewed as essential for the implementation of new initiatives. Teachers talked about cooperation and crossovers, where teachers in the intermediate grades were helping teachers in the lower grades implement activities and vice versa:

> There are seven other teachers out there who don’t generally teach phys. ed. at this school, and they are now responsible for DPA in their classrooms. You could feel how nervous they felt. I think working together has made people who would be very uncomfortable teaching physical activity much more comfortable, and that’s been a change. (Kristen, Grade 8 teacher)

However, not all teachers perceived the process to be equally satisfying and felt pressured by the demands that DPA placed on them, particularly those teachers who felt they were never involved in sports themselves. Nevertheless, the various efforts
integrated into the schools to provide support for those teachers, and the collective commitment and enthusiasm of the HPS team were seen as vital to supporting discouraged teachers and helping them develop the necessary attitudes and skills to carry out their responsibilities. Accordingly, teacher collaboration around ways of delivering DPA was considered important for incorporating physical activity into teachers’ daily practices and minimising teacher stress associated with taking on responsibilities for which they were not prepared. This collaboration was seen as being essential for the development of teachers’ knowledge and repertoire of skills to apply DPA in their classrooms. Still, the differences in teachers’ perceptions about the success of the process highlight the ongoing challenges to best support teachers’ involvement with the HPS process. Certainly, teachers who are provided with resources and training are more likely to implement required changes than those who are not (Larsen & Samdal, 2003).

*Student Participation and Leadership.* There was a general consensus among the teachers that HPS initiatives linked well with a range of educational initiatives aimed at addressing the difficulties experienced by children and young people struggling academically and emotionally. Efforts to address the needs of vulnerable students and those with different needs were seen as a feature of being a healthy school. Above all, what was important was providing opportunities for students to participate even in a small way to school life:

I had a girl last year that didn’t get involved in anything, and didn’t have a great home life, and I kept at her and let her know that I cared. I wanted her to get involved. I sent her down to the primary classes with another student to teach the primary kids how to do that conga line. Even just that one leadership opportunity she had, she took so seriously because somebody believed in her. So I think you can reach those kids you just have to keep trying, and finding something that they like. (Andrea, Grade 7/8 teacher)
One of the ways to promote healthy eating at each school, and to provide healthy snack options, was to offer snack baskets in the hallways at Highbrook School, or, in the case of Parkway School, in each classroom. Students with developmental disabilities at Parkway School were responsible for putting snack baskets together and delivering them to the classrooms. This activity was not only regarded as essential to these students’ self-esteem but also for teaching them about healthy foods. Students struggling with their studies were also provided with continued support through a study skills program, where teachers were available in the library over the recess to tutor and provide support for doing homework that was incomplete or perceived as challenging. Such initiatives reflect an interest in addressing the multiple needs of students while enhancing student participation in a variety of related activities.

Both schools had student athletic councils, consisting of students in the intermediate grades. These students were involved in planning and leading some of the school’s physical activity initiatives, games, and play days. At Parkway School, students were also trained to be physical activity leaders. These leaders provided support to teachers in the primary classrooms and in the gymnasium. Training students for these responsibilities helped students to learn valuable leadership skills, and provided support for teachers while creating opportunities for other students at school to be active. The process was detailed by Amy, one of the administrators: “They lead physical activity games for three weeks and then the teacher can walk away with those games, they’ve seen kids lead them and now they have, you know, a basket of new games that they can play.”
Part of engaging students in decision making around healthy foods was to appoint them as peer tutors. Students in Grades 7 and 8 at Parkway School acted as lunch monitors, supervising the primary classes and encouraging students to eat their sandwiches and fruit before their cookies, further reinforcing and demonstrating students’ understanding and commitment to healthy choices.

*Parent and Community Involvement.* Parent and community participation is considered a key strategy for implementing HPS. One administrator involved parents and members of the school community to overcome some of the demands posed by expanding HPS initiatives.

A program was created at Highbrook School where parents would come in over the summer to weed, water, and take care of the yard. The yard was then expanded and landscaped to improve play space. This program also translated into the expanded use of the school’s outdoor facilities by community members who also used the space for their daily walks. Initiatives that have been found to be successful are those that have strong community representatives and involvement (Gillespie, 1998). Similarly, effective community partnerships and collaboration with other agencies are an important catalyst for advancing HPS initiatives. An example of such efforts was provided by Amy at Parkway School, who described the involvement of members of the police force in the breakfast club. “The kids love it. So I think it’s just nice for them to see the police in a positive way.”

*Challenges to Sustainability.* Sustainability of the HPS momentum was threatened by several factors related to funding, infrastructure, and conflicts with educational and curricular requirements. The key informants believed long-term sustainability was
dependent on a dedicated central support mechanism whose sole responsibility would be
the coordination and delivery of HPS initiatives. Even when central support mechanisms
were put in place in these two boards, coordinators and facilitators still had to juggle their
multiple responsibilities. A member of the school health team at one of the health units
expressed her frustration:

When you read about programs that are doing really well it’s that they have
someone, a nurse or somebody in the school leading that committee, and we just
don’t have the money or staffing for that. (Jayne, Key Informant)

Some saw sustainability in terms of the drive and good will of the groups and individuals
at the school that were responsible for the development of HPS initiatives, but realised
the difficulty associated with staff and administrator mobility:

We’ll have a change in principalship next fall and I mean the first thing that some
of us will be doing is knocking on the doorstep of this new person and saying listen
we’ve been doing this, and this matters, we value it, and we need it to continue, and
hope that there’s support there. (Alan, Grade 7 teacher)

The turnover in school leadership raised issues about sustainability for projects, not
simply in terms of a loss of funding, but also of the trust and goodwill that takes time and
effort to build and maintain.

School initiatives are more likely to become sustainable if they are integrated into
school improvement plans (Adelman & Taylor, 2003). Yet it is not clear if the MOE has
fully embraced the healthy schools initiatives. Certainly, the MOE has included a series
of website ‘Tips’ to encourage teachers and principals to “Include healthy schools
activities as a part of your school’s improvement plans” (2008). However, the priorities
outlined by the MOE-- increasing student achievement, reducing the gaps in student
achievement, and instilling public confidence-- do not mention healthy schools as a direct
focus. The current lack of formalisation of healthy school policies into actual school
improvement plans and the lack of active support by the Ministry of Education suggests this is largely a “symbolic policy” (Cooper et al., 2003, p. 58). Under these circumstances, a common sentiment across the study participants was that HPS initiatives were still regarded as an add-on to the school’s activities and that status did not seem to make sense to them. While teachers strongly believed that HPS did not distract from the goals of schooling, a common complaint from teachers in both schools was that HPS initiatives were not a priority when it came down to the academic goals of schools. Teachers and administrators alike lamented that, despite the MOE advocating for promoting health through schools, these initiatives were still not highly valued. There was a shared belief that establishing the impact and value of HPS, and showing the links with the positive outcomes associated with healthy schools through research, might make a difference to the support health promoting schools received from the MOE:

We don’t have data to support the benefits of being a healthy school. To make the government change that mandate we need to start collecting data on this stuff to make it known how beneficial it is to our kids. (Sarah, Administrator)

Likewise, teachers understood the value of embedding HPS initiatives into a wider range of school and board-based initiatives but felt that they were sometimes unsure where to start with the competing and conflicting messages they receive and the lack of alignment of policies emerging from the various MOE branches. Moreover, teachers commonly agreed that the MOE provides a lot of information on what should be done in schools, yet they do not provide information on how things should be done to fit in all that is required. Some teachers were clear on how HPS initiatives related to other agendas in their own areas, but called for more guidance on how to achieve coordination with other strategies. The difficulty of fitting all the curricular requirements in was also
exacerbated by the time demands required for literacy and numeracy. These conflicting demands were clearly outlined by Andrea, a Grade 7/8 teacher:

There’s just not the time, when everything’s mandated; because it is 180 to 220, about 80 minutes, so two periods a day, which gives us all a rotary and that’s when we have to fit in DPA as well, and in rotary we have the science, the history, the geography, music, art, drama, and computers, so we now have seven subjects for two periods a day.

Despite the success of the partnerships between boards of education and health units, the case studies identify the challenges that are related to the interface between the health and education sectors. For example, while these partnerships were seen as essential for improved interpersonal relationships and for mobilising formal and informal organisational capacities and resources, they also brought out some of the existing tensions rooted in disciplinary differences (see also Milbourne et al., 2003). For example, educators appreciated the role that nurses played in the professional development of teachers through the workshops they conducted but felt that nurses did not have the instructional tools to be in the classrooms teaching students about health issues, or to engage students in the process. Moreover, educators felt that at times the resources at the health units, while plentiful, were not always made public, highlighting the need for improved visibility of the school health nurses and improved communication channels.

On the other hand, health professionals felt that, since initiatives were in schools, educators were always in the driver’s seat and were the gatekeepers to delivering health messages in schools. A member of the school health team at the health unit explained:

A lot of the times we’re trying to get our programs in the door and it’s not necessarily what the schools are looking for so they don’t have to work with us, so any time someone from the school board says we would like to work with you to promote health in our schools we’re game. It means that we can, you know, do our programmes and reach our mandate, and having them coming to us instead of us always trying to go to them is nice. (Sheila, Key Informant)
A common message that emerged from both cases is the need to have a governing body in Ontario that would provide a coordinated message and guidance on how to enable schools to implement the HPS mandate. Currently, the Ontario Healthy Schools Coalition (OHSC)\(^5\) assumes the provincial role of advancing the healthy schools agenda, providing a forum for sharing success stories, sharing knowledge, and advocating for strategic action both at the Ministry of Health Promotion and the Ministry of Education.

While the coalition is credited for the role it plays in bringing the healthy schools agenda to the forefront, and for maintaining that momentum, educators who participated in the study felt that they were generally underrepresented, and unable to consistently be part of the teleconferences and the annual forum that the OHSC conducts. A member of a school board involved in the HPS efforts expressed her thoughts on the lack of relevance of the OHSC to the education community:

> If I went out to my teachers in my school right now and I talked to the phys. ed. teachers they would not even know that the OHSC existed. So how do they get in? They have to work with teachers as a community and share resources, and a lot of times their approach is not working for educators. I think that is a missing link. (Nora, Key Informant)

Other identified problems included teleconferences that took place during school hours and a forum during the school year, which made it difficult for schools to provide release time for teachers. “Was I the only teacher there? I thought I was” commented one teacher regarding the OHSC conference that took place May 2008 in Toronto.

\(^5\) In December 2000, the Ontario Public Health Association (OPHA) Healthy Schools Workgroup merged with the University of Toronto’s Centre for Health Promotion "School Health Interest Group" and the Coalition of Ontario Agencies for School Health to form the Ontario Healthy Schools Coalition (OHSC).
The results of the two case studies demonstrate how the principles of HPS were differentially and similarly adapted in two school boards and schools in Ontario, and present the processes and organisational changes that were undertaken to translate these principles into policy and practice at the local board and school levels. Interviews and focus groups with the study participants contribute to an understanding of how healthy schools policies are being interpreted, adapted, and implemented. These portrayals of HPS initiatives include descriptions of the features of the two schools and associated activities and outcomes. The different perspectives and emphases across initiatives contribute to a better understanding of what makes a HPS, and to mapping out common and unique views of the identified themes and how they contribute to the development of HPS. Moreover, the case studies are able to identify challenges and threats to the sustainability of HPS initiatives that need to be addressed.

Discussion

A key element of a settings approach to health promotion is that it attends to both public health and educational agendas, where the action for health must help deliver the core business of the setting, in this case education (Dooris, 2004; St. Leger, 2004). This study set out to examine two Ontario schools that had embraced this settings approach through the development and implementation of HPS initiatives. The research was guided by three research questions: (a) What does a health promoting school look like? (b) What are the perceptions of students, teachers, and administrators regarding what constitutes a HPS? and (c) What are the key elements at the structural and organisational levels that need to be in place to allow a HPS to work most effectively? Combined, the case studies provide a picture of two schools that have embraced the notion of becoming a HPS,
including the implementation of practices and policies to support their efforts. The students, teachers, and administrators were very supportive of HPS initiatives in the schools, concluding that these initiatives had positive impacts on teaching, learning, and the overall culture of the school.

The primary focus of this study was to address the third research question. The findings demonstrate how the notion of HPS was adapted to meet the multiple needs in each of the schools and school boards. Certainly, the two schools differed in many of their specific practices and policies related to their HPS initiatives. Nevertheless, underlying these differences was a common set of beliefs about the structures, resources, and supports required to be successful. These beliefs can be summarised with two underlying, operational elements that were claimed to be key for the ongoing success of their efforts. First, successful HPS initiatives are recognised as requiring whole-school approaches that incorporate multiple initiatives. Second, implementation of HPS initiatives requires sustained and coordinated supports at multiple levels of the system.

*The Need for a Whole School Approach*

The case studies demonstrated that the term HPS is an umbrella term for a very wide range of practices, and that the process of becoming a HPS constituted ongoing systemic and strategic multiple initiatives. Such initiatives went beyond a focus on physical activity to address the diverse needs of students. Endeavours to become a HPS were characterised by a commitment to enhancing each school’s culture and climate while focusing on a whole school change approach. The educators in these schools were working hard to ensure their efforts would not become a set of bounded and short-term interventions. Initiatives were used to create school cultures that could tackle a range of
issues amongst students, promoting the value attached to healthy living and healthy choices, increasing student engagement, involvement, and leadership. The goal was to create positive experiences for students, through the establishment of safe and supportive school environments for staff and students. Of course, a challenge for each school was that such efforts to embed HPS initiatives into their school operations required ample time for planning and implementing initiatives that were flexible to meet the school’s own demands.

A key feature of both schools was the significant lead-in time allocated before initiatives were implemented, and having the support of key personnel in each school board. The principal at each school had developed a working structure that provided the time and opportunity for the staff to explore the notion of the HPS as a whole, and options and ideas to become a HPS. As Milbourne and colleagues (2003) suggest, “the clearer the project is about its aims and the way it should work, the stronger it is in arguing its own values and outcomes” (Milbourne, Macrae, & Maguire, 2003; p. 27). Such time allocation is not possible or feasible when partnerships or projects are saddled with the pressures to deliver tangible results under tight time constraints, a typical constraint found in education. These two schools had the advantage of allowing their initiatives to incubate before implementation, resulting in decisions and plans that were less rushed and having the time to establish models to implement their HPS strategies. As such, the philosophy of a healthy school entailed a concerted effort to produce incremental, manageable changes that were elements of a whole school cultural change that would occur over time.
The Need for Support and Resources

Clearly the process of planning and implementing HPS initiatives was crucial to the success and sustainability of these initiatives. Nonetheless, these two cases also highlight the importance of built-in/established support mechanisms at different levels of the educational organisation and between organisations. The findings indicate that the success of HPS initiatives was not only attributed to practices that had time to develop and mature. Both schools benefited from having visionary leaders who were able to generate a sense of commitment, ownership, and shared values at the school boards and schools (Deft, 1999; Larsen & Samdal, 2008). At the board level HPS initiatives were bolstered by the alignment of healthy school activities with wider school board plans. Such plans included a centralised and integrated support system through the creation of coordinating committees and specific coordinators with appropriate levels of expertise to provide the support and resources required by the schools. It is important to recognise the momentum for HPS and the success of such initiatives is contingent upon the efforts of actors within a locale and the implementation structures put in place (Hjern & Porter, 1981). Both case studies identified a group of enthusiastic and motivated people at different organisational levels who had a shared goal.

At the school level, strong leadership included a principal and vice-principal who were committed to healthy schools and also actively participated in the school’s HPS team. In addition, these administrators were key in including HPS initiatives as part of their school improvement plans and in empowering team members by putting in place opportunities for capacity building and prioritising ongoing and embedded professional development. Supports were established through broad teacher and student commitment
as manifest in the collaboration and cooperation between administrators and teachers, and across levels of teachers. Throughout, efforts were made to support teachers to be part of the initiative, focusing especially on those teachers who were uncomfortable to take on additional responsibilities. Moreover, students were an integral part of the school-level support system, as students would assist their peers and teachers in their capacities as lunch monitors and members of athletic councils.

The board-level coordinators (the coordinating committee in the Parkway School Board) were recognised for the crucial roles they played in the HPS initiatives at both schools. These roles included exchange of information regarding HPS that they received from attending professional conferences, translating such information into practice, and developing the required resources. Their roles also entailed seeking and applying for funding to support teacher professional development around HPS activities, planning and implementing workshops for teachers and student leaders, and purchasing school sports equipment. Teachers and administrators alike relied on the coordinators to provide specialist expertise, to establish links with community groups and agencies, and to network with other schools having more experience implementing HPS initiatives. These coordinators were also credited for their assistance to local school health teams who were still involved in their regular teaching and administrative responsibilities. As such, these coordinators embody “interactive communities” whose role is to share new strategies through collective and collegial means as opposed to a perfunctory operation to implement a structured initiative (Hoyle et al, 2008, p. 5).

The success of HPS initiatives are also predicated on an integration of health and educational strategies (Dooris, 2005; Paulus, 2005). The case studies highlight the
benefits of successful health-education partnerships. Their resulting policies and activities were the culmination of ongoing dialogues and efforts to achieve a synergy between the two agencies in the implementation of HPS initiatives. There was a clear investment and commitment to the partnership by each sector in terms of the fiscal and human resources allocated that would support HPS activities, which included responsibilities for identifying action areas to be shared by both agencies. Despite these milestones, there were overriding concerns about the sustainability of the current initiatives, due primarily to the need for ongoing external policies and funding resources. Funds from both the education and health sectors were being used to fund the central coordinators or other aspects of the initiatives. Nonetheless, it was unclear how long such funding could continue.

Participants in these two cases acknowledged the value of the centralised support they received from the boards of education and their resulting partnerships with the health units, but they reported that the long-term success of their efforts required a real commitment from the Ministry of Education (MOE). Provincial policies, and the commitment to these policies, have the potential to either enhance or diminish the long-term viability of HPS initiatives. As an example, the 2005 legislation requiring all schools to implement daily physical activity (DPA) for all elementary schools put at least one aspect of HPS at the forefront of school policy and practice. Yet it appears schools often lack the necessary capacity, resources, and support to effectively implement this legislation (Cooper, Fusarelli, & Randall, 2004). As described previously, the Ministry of Education has not provided the resources and supports to maintain DPA. Participants continually voiced their concerns about the difficulties in sustaining their HPS efforts due
to challenges incorporating HPS initiatives with other school improvement plans required by the Ministry of Education. They noted the conflicting and competing demands on their time and resources because of competing Ministry expectations. A common message that emerged was the need to have a coordinated message and guidance from the MOE on how to enable schools to respond to the new agenda in a way that provides an alignment and coordination of the HPS strategy with other Ministry strategies.

Certainly, the local control likely contributed to the success of these two cases, enabling “voluntary cooperation” (Milbourne, 2002, p. 33), while avoiding the centrally prescribed targets and performance mechanisms that can stifle and restrict innovations that adapt to local contexts (Gewirtz, 1998; Milbourne). The lack of explicit policies and guidelines for the implementation of HPS models from the Ministry of Education enabled school boards to adapt and make decisions to meet their local needs, without attempting to outline any one preferred model of a HPS. Hence the cases varied in the range of activities they undertook, the management structures that were put in place, the financial and human resources used, and the manner in which resources were used. This local control likely strengthened the schools’ commitment to the initiatives (e.g., Gillies, 1998; Rowling & Jeffreys, 2006). However, central support strategies at different stages of implementation are necessary to address the varying capacities of schools to implement and maintain HPS initiatives and strategies (Hoyle et al., 2008; Rowling & Jeffreys, 2006).

If educational policies are to further HPS initiatives across schools, there needs to be a recognition that a HPS is not simply a short-term initiative, amongst many, but rather a longer-term vision for how schools should operate. Tsouros likens the HPS to a
social movement rather than an intervention (cited in Nutbeam, 1998). Such an approach requires a more fundamental examination of how current provincial policies and structures are negotiated and outlined.

While board-level generated local policies may be sufficient to support HPS initiatives in certain cases, ongoing provincial-level policies and support would likely be required for more system wide success of HPS initiatives. Creating a dedicated central support group at the provincial level that equally represents the health and education sectors would provide the scaffolding to schools and school boards required during the implementation of HPS, and would work closely with experienced full-time coordinators and facilitators at the school board level including providing professional development of teachers around HPS initiatives.

The Need for Evidence

As the literature suggests, initiatives that aim to influence the contextual changes “in which health is created and experienced” (Gillies, 1998, p. 114) do not lend themselves well to measurement indicators. In particular, when the main concern of organisations is qualitative change, “there are few agreed performance standards available [nor] any obvious bottom line against which progress can be measured” (Edwards & Hulme, 1995, p. 11, as cited in Milbourne et al., 2003). These issues present challenges for evaluating and assessing the success of HPS. For example, anecdotal reports by the participants suggest that the HPS had positive effects that were evident in a variety of ways. Students were positive about being part of HPS but were generally unable to articulate specific outcomes from these initiatives. In both cases, a more positive school culture and climate that encompassed students, teachers, and the school
communities were highlighted as key attributes of becoming a HPS. Such long-term outcomes are likely to be more difficult to identify, and may well be attributable to other initiatives as well as to the HPS approach. Yet participants believed that having data to support their observed benefits would legitimise their efforts and justify their actions.

Currently, there are difficulties inherent to assessing what data to collect and what constitutes a successful HPS. Further research is required to determine what counts as evidence of success by identifying quality practice goals and outcomes, for example, the involvement of students in the development and delivery of HPS initiatives in schools. In addition to operationalising program components, there is a need to establish benchmarks and indicators for tracking the process of development of HPS. Concurrently, the development of process and outcome measures is essential for deriving an evaluation framework that would reflect the spectrum of possible approaches to HPS. Such an exercise involves collecting data from multiple sources and sites and refining instruments that capture the multi-strategic processes of becoming HPS (see also Rowling, 2005).

Translating the various elements of the demonstration projects undertaken by the various schools under the Ministry’s social marketing scheme into a blueprint for how schools could adopt and implement HPS initiatives would also contribute to the development of HPS implementation and evaluation frameworks.

Once benchmarks and indicators have been established, subsequent research will be able to focus on the organisational and structural changes and the elements that are required to improve HPS initiatives and their implementation based on schools’ contextual factors (Rowling & Jeffreys, 2006). This research exploring the implementation process of HPS would also contribute to exploring the unexamined
assumptions about change in schools that accompany such initiatives, and are largely unknown at the moment. Nonetheless, such in-depth research is a challenge. Our own attempts were restricted by our struggles to find time to meet with participants and gain access to the schools for an extended time period. Future research will benefit from a more prolonged presence in a larger number of schools, each at different stages of becoming a HPS.

Conclusion

The development of HPS was driven by health professionals who saw it as an opportunity to enhance population health by accessing young people across various social strata (Young, 2006). The fact that the model did not originate in the education sector further emphasises the need for a HPS model to be relevant to both public policy sectors where linkages between education and health can be mapped (St. Leger & Nutbeam, 2000), and the relationship between education and health can be translated into practice. This study was able to present two models of interagency partnerships and management and coordination supports created to implement healthy school initiatives. It identified a network of actors involved in the planning and delivering of HPS initiatives, and examined their goals and strategies. As the case studies have identified, and as is supported by the literature, developing the organisational capacity of schools and school boards to implement and sustain HPS initiatives is an ongoing, long-term, and complex process (Rowling, 2005) that involves the development of structures, policies, and resources, linkages with external agencies, and staff professional development (Hoyle, Samek, & Valois, 2008). Our results provide a beginning of a blueprint that would support a more extensive provincial roll-out of HPS. This blueprint, outlining policies
and guidelines for successful implementation, will strengthen as other similar initiatives are documented.

Certainly, a broader range of evidence is required to inform our future policies and practices that best support HPS initiatives, and this need for ongoing explorations is consistent with the settings approach to health. Rather than attempting to develop a standardised framework of what constitutes a HPS, what is required is research that can produce practice-based evidence, or what Simons and colleagues (2003) describe as “situated generalisation” (p. 360), which is the “process of transforming context-bound data into transferable evidence for other contacts” (Rowling & Jeffreys, 2006, p. 707) based on the contexts, cultures, and internal structures inherent to schools. Subsequent research in other schools and boards in Ontario should further develop our understanding of the impacts of these various contexts, cultures, and internal structures. At the same time, we should be able to identify other important factors that might facilitate or impede the important partnerships and supports needed to allow organisations rooted in distinct disciplines to capitalise on their differences (Griffiths, 2000).

Health Promoting Schools are manifestations of social ecological models of health promotion that target the physical, social, mental, and emotional wellbeing of students. While accomplishing these broad aims might appear to compete with the curricular and educational goals of schooling, the case studies show that it is possible to address both realms. Efforts that continue to explore best ways of incorporating HPS practices as integral elements of schooling will only serve to improve the lives of young people.
CHAPTER V: DISCUSSION AND IMPLICATIONS

Introduction

The three preceding manuscripts have explored children’s health and wellbeing within and across schools. The foundation for this body of research is the relevance and value of a settings approach, as represented by the principles of Health Promoting Schools (HPS), in advancing the health and wellbeing of young people. HPS are predicated on a theoretical notion that schools are not only sites where health messages are delivered, and health practices enforced, but also that schools can advance the health of students through multiple strategies. These strategies encompass the school environment, structural issues, and organisational practices (Inchley, Muldoon, & Currie, 2006; Markham & Aveyard, 2003). The success of a settings approach to health is determined to a large extent by the degree to which these strategies are congruent with the core business of the schools (Dooris, 2004; International Union for Health Promotion and Education (IUHPE), 2000). Accordingly, the success of HPS is contingent on a closer integration of health and educational activities and a research agenda that explores the association of health and educational indicators.

Summary of Findings

The research highlighted in the three manuscripts begins to address the multiple dimensions of health promoting schools in Canada. The first manuscript, Relationship between health and achievement: Evidence from the Health Behaviour in School-aged Children study, established the association of student health to academic achievement. Higher levels of students’ Self-rated Health (SRH) were associated with higher overall school marks. As an example, on a scale from 1 to 4, the academic achievement was 2.37
for a student reporting poor health, and 3.03 for a student reporting excellent health (p < .001). While only 2.7% of the variation in marks within schools was associated with SRH, approximately 20% of the variation in marks associated with SRH occurred between schools, emphasising the likely role of school contextual variations in achievement due to health. This finding was further supported by a contextual effect $\beta_c$ in this analysis of 0.46 ($\beta_b = 0.64$ and $\beta_w = 0.18$). A contextual effect ($\beta_c$) “is the extent to which the magnitude of the organisation-level relationship $\beta_b$, differs from the person-level effect, $\beta_w$” (Raudenbush & Bryk, 2002, p. 139). As such, the contextual effect is the expected difference in achievement between two students who have the same levels of individual SRH, but who attend schools differing by one standard deviation unit in mean SRH.

Moreover, the gradient in achievement due to health was not consistent across schools. In some schools, the relationship between SRH and marks was more pronounced (steeper gradient), suggesting that there was more inequality in achievement associated with SRH. In other schools, the relationship between SRH and marks was shallower (flatter gradient), suggesting that there was less inequality in achievement for students of varying SRH in these schools. Thus my findings suggest that some schools are better able to achieve both higher levels of achievement and less inequality in achievement in spite of students’ differing levels of SRH. When variations in student outcomes are associated with school-related factors, a school contextual effect is thought to exist. Duncan and Raudenbush (1999) maintain that “context can be said to matter if differences among social contexts are found to be important in explaining individual differences in achieving ends most of us value--mental health, literacy, intellectual growth, educational
attainment, occupational status, and the like” (p. 29). This study demonstrates that the relationships between health and achievement are, to a certain extent, dependent on school contextual variations emphasising the need to explore school contextual factors and their association with student health outcomes.

The associations between composition and contextual effects and student health outcomes were examined in the second manuscript, *Student health and wellbeing: An examination of student and school factors*. The relationships between student-level variables representing social and demographic factors, and school-level factors representing the school culture, environment, and organisational practices were examined in relation to four measures of student health and wellbeing outcomes. The four measures of health and wellbeing were Self-rated Health (SRH), Life Satisfaction (LS), Emotional Wellbeing (EWB), and Subjective Health Complaints (SHC). The low to moderate significant correlations (0.30 to 0.61) amongst the four outcomes suggest that each taps distinct, albeit related, dimensions of health and wellbeing. The extent to which these outcomes were a function of the differences between schools varied by the outcome examined. The variability between schools in these analyses ranged from 2% for SRH, 3.2% for LS, 3.5% for EWB, to 5.1% for SHC. Hence over 95% of the variance in students’ health outcomes occurred across individuals (within schools). Student factors associated with the four health outcomes included gender, family wealth, family structure, academic achievement, and neighbourhood, explaining between 9.2% and 21% of the individual-level variance in SRH, LS, and SHC. These student factors were less associated with EWB, with gender, family wealth, and academic achievement accounting for only 2.3% of the individual-level variance. The neighbourhood effect is of particular
interest because it is an example of a “structural relationship” (Garner & Raudenbush, 1991, p. 253) representing social group characteristics that may vary from school to school albeit being an individual-level variable.

In the final models, the explained between-school variances in the outcomes accounted for by the student- and school-level variables, were 37.6% for SRH, 13% for LS, 18% for EWB, and 14% for LS. A number of school factors were found to be associated with students’ health and wellbeing outcomes. These included the socio-economic and academic standing of a school and the disciplinary climate at the school, represented by two factors, problem behaviours and student aggression, all as rated by the principal. Considering that a school’s disciplinary climate is generally regarded as an indicator of a school’s climate and the inner workings of a school (Ma & Crocker, 2007), both problem behaviours and student aggression are likely proxy measures for the schools’ context and climate.

Results indicated that students’ reported Life Satisfaction (LS) and Emotional Wellbeing (EWB) were higher in schools having wealthier populations. LS was also found to be higher in schools with high academic standing. These school-level effects were in addition to an individual’s own self-reported family wealth and achievement, suggesting that students not only benefit from their own personal situation, but also from the school culture created by serving socioeconomically and academically advantaged populations. On the other hand, increased amounts of problem behaviours were associated with lower levels of reported Self-rated Health (SRH), Subjective Health Complaints (SHC), and LS. In addition, more problematic behaviours (student aggression) were associated with lower levels of EWB.
Admittedly, the systematic differences between schools in relation to students’ health outcomes were not large (between 2% and 5% variability between schools). The low variability between schools in the four health outcomes could be attributed to the generally small degree of variation in student composition and school structure found within Canadian public schools. Less variance between contexts is present when the units at the higher level of analysis, in this case the schools, are homogeneous, than when there is significant heterogeneity across these units (Shinn, 2003). Further, these findings are consistent with the results of a review of 17 studies (see Sellstrom & Bremberg, 2006) examining school effects on smoking behaviours, problem behaviours, academic achievement, and student wellbeing. While the Sellstrom and Bremberg study reported variability of 7% to 12% between schools for student health behaviours, the authors concluded that less than 2% of the variability in students’ wellbeing occurred between schools. However, the low variability in outcomes across schools does not imply that the school setting is irrelevant to student outcomes (Duncan & Raudenbush, 1999). The student-level variables included in the multilevel models were intended to control for student composition, allowing the examination of the association between school factors and student outcomes. While this practice is recommended by researchers examining school effectiveness research (e.g., Lee, 2000; Palardy, 2008), “the inclusion of multiple, inter-correlated individual-level variables could decrease variance explained by school-level variables”; in addition, when “such predictors are controlled for in the statistical model they may act as proxies for contextual effects and can therefore be misinterpreted and possibly dilute the school effect” (Sellstrom & Bremberg, 2006, p. 154).
An important finding from my research is that the relationships amongst student-level variables and health and wellbeing outcomes are not consistent across schools, but exhibit random associations. A random effect, as opposed to a fixed effect, occurs if a student-level variable has a varying relationship with an outcome across schools, and whereby the variability in school factors could either ameliorate or exacerbate the relationships between student-level variables and student health outcomes. For example, results of my research demonstrate that students from less advantaged neighbourhoods have an even greater disadvantage in terms of their SRH in schools having more crowded classrooms. Similarly, these students do not seem to benefit as much by the positive health benefits, in this case their SHC, associated with more positive school climates. As another example, the EWB of low achieving students varies depending on the school they attend. Low achieving students have relatively lower levels of EWB, compared to high achieving students, if they are in schools with high academic standing. While it is difficult to provide an explanation for this finding, it is possible that low achieving students cannot keep up academically with their high achieving peers in schools that demonstrate high academic expectations and results. Similarly, the gaps in EWB are greater for low achieving students in schools with high levels of problem behaviours.

The relationship between students’ family structure, and their health and wellbeing outcomes also vary by the schools these students attend. The gap in LS between students living with both parents and those who are not is heightened in schools having higher levels of aggression. This finding suggests that students who do not live with both parents experience lower levels of LS in schools having higher levels of aggression. On the other hand, the gap in LS between students living with both parents and those who do
not is reduced in schools having higher academic standing. It is possible that positive school cultures, as exemplified by reduced disciplinary problems and increased academic aspirations, provide increased opportunities for meaningful relationships and high expectations for students from single-parent families.

Lastly, although girls generally report lower health outcomes across schools, schools having higher socio-economic levels are associated with even larger SHC gaps between boys and girls. Also, the negative associations between poor school climates, and health and wellbeing outcomes, as manifested through problem behaviours, were greater for girls than boys.

The third manuscript, *The Health Promoting School: Two case studies in Ontario*, explored what a HPS looks like in practice. This study included qualitative examinations of two schools in Ontario to “zoom in” (Onwuegbuzie & Leech, 2006) on the organisational and structural elements within these schools that appear to be essential for accomplishing a HPS status, and the mechanisms by which these elements intervene to support student health and wellbeing outcomes.

At the centre of the HPS agenda is improving health and educational achievement for all students within a school (St. Leger, 2004). The impetus for adopting HPS principles and striving to become a HPS was a belief held by participants regarding the close association between health and achievement. Teachers and administrators in the schools alluded to increased concentration among students on their school work and improved learning. These statements were corroborated by students who reported seeing their grades improve over the few years their schools had adopted HPS principles. While such associations have yet to be systematically documented, these qualitative findings are
supported by one recent study completed in Ontario (Guertin, 2007). Guertin found that schools adopting the *Living School* principles, a HPS initiative, obtained significant improvements in student achievement on Grades 3 and 6 provincial test scores.

The case studies highlight the changes to the school contextual factors, including organisation, structure, and processes that are considered to be central for becoming a HPS. The common and distinctive features of the two jurisdictions and schools helped to highlight the various perspectives around HPS, the organisational restructuring that was established to implement a vision of HPS, and the barriers as well as the supports for implementation. Moreover, the case studies show that adopting the HPS principles was viewed by the study participants as a conduit for creating schools that can address a wide range of student needs. The initiatives were considered to help increase student participation in physical activity and clubs while providing leadership opportunities. In the case of the Parkway School Board, whose student population is of a low to middle socio-economic status, an initiative such as the breakfast program is representative of an effort by the school to address factors associated with the school’s student composition and an effort at minimising the effects of student disadvantage on learning. In addition to encouraging healthy eating, having a breakfast program was considered as a way of addressing student socio-economic disadvantage as a particular need and was seen as valuable in its own right to create an inclusive school environment.

School conditions and opportunities enabled students to feel engaged and connected to school in the two case studies. The two schools described disciplinary practices that were non-punitive. Combined, these factors were considered integral to the notion of HPS and improved student health and wellbeing. Teachers and administrators
attributed the decrease in problem behaviours, lower levels of bullying and fighting among students, and improved attendance to becoming a HPS. The commonly expressed key to the success of these initiatives was a shared collective belief in the value of a HPS and the need to establish collaborative approaches between the health and education sectors, and within educational institutions. While these schools were proud of the achievements gained so far, they were also cognisant of the challenges embedded in collaborative efforts, and the constraints presented by professional and organisational demands, as well as cultural and institutional assumptions (see also Lander & Nilsson, 2005; Weare, 2005).

The implementation model of HPS activities based on the two case studies is represented in Figure 5. An implementation model and a programmatic theory are useful for establishing evaluation frameworks and mechanisms to monitor a health promoting school’s practice, including the degree of implementation, and the effectiveness of the HPS approach. Based on the two case studies, a model of implementation is presented (Figure 5) that represents common processes across the two schools, in what Whitelaw and colleagues (2006) describe as a provisional model. The model depicts the processes involved in the implementation of HPS and the elements at the core of the two health promoting schools. These factors are complex and do not occur in isolation of one another. Rather, they are interdependent and often develop in tandem (Inchley, Muldoon, & Currie, 2006).

The model highlights the agents involved in the implementation of the HPS, and the elements that constitute these initiatives. Each of the hexagons represents the governing bodies for the education and health sectors at the provincial levels, in this case,
the Ontario Ministry of Education and the Ontario Ministry of Health Promotion. The ovals each represent members of each sector at the board/regional level who are responsible for the oversight of school health programs. Within boards of education, these may be curriculum coordinators for physical health and education. Within public health units, these likely include both the school health managers and school health nurses responsible for addressing school health programs through the Chronic Disease and Injury Prevention Department. The rectangle with rounded corners represents a coordinating committee or a coordinator that is based on a partnership between education and health. In the case of the Parkway School Board, facilitators or school coordinators are members of the coordinating committee. The two-way arrows between the coordinating committee/coordinator depict the linkages and collaboration required between this oversight entity and the school health committee, as well as school staff (administrators, teachers, and support staff) and students to enact the Health Promoting School (HPS). Moreover, enacting the HPS initiatives requires support from community partnerships, represented at the bottom of the figure. Sustainability of HPS initiatives is supported to a large extent by the coordinating committee/coordinator. The dashed box around the provincial-level School Health Committee indicates the absence of this structure at the time this study was conducted. The dashed lines depict the proposed relationships such a committee would have with the board-level school health coordinating committees in addition to the support it could provide for a long-term strategy and sustainability of HPS initiatives.

Furthermore, the model includes three components considered to be fundamental to achieving a HPS status. These three components included creating environments and
opportunities that would enhance students’ physical health, emotional health, and staff’s professional development and wellbeing. Together, these components, as identified by participants in the case studies, were considered to be at the centre of becoming a HPS.

The HPS model as illustrated in Figure 5 displays the elements, actors, and activities associated with the implementation of two HPS in Ontario, providing a possible framework for other jurisdictions to adopt. Frameworks at best play contributory roles in implementation and only when other multiple elements are in place (Whitelaw, Martin, Kerr, & Wimbush, 2006).

Further research into HPS models in Ontario and Canada would allow testing of the model and provide further examples to improve and expand it.

Discussion

From a settings perspective, health is shaped by the context in which individuals find themselves, where not only the physical environment but the surrounding ethos and relationships can support, or indeed undermine, health. As such, health is not simply a result of what individuals do to look after their own health, through healthy habits and lifestyles. Rather, health encompasses physical, mental, and emotional wellbeing and social cohesion at organisational and community levels. While emotional and social indicators are considered key to positive human development and effective education (Weare, 2007), they also reflect the characteristics that are representative of the school and local environments, and are congruent and compatible with the multi-dimensional nature of HPS. Peberdy (1997) likens an indicator to a road sign that “shows whether you are on the right road, how far you have travelled, and how far you still have to go” (p. 289). Her depiction of indicators as signs along a process are corroborated by Young
(2006) who defines an indicator as “a sign that gives a fair and accurate representation of a part of the working of a complex system and changes within it” (p. 12), suggesting that an indicator can be a feature of individuals, a group, or the environment (see also Nutbeam, 1998).

My research has pursued a three-pronged approach to explore a settings approach to Health Promoting Schools (HPS) in Canada. The work focused on identifying the relationships amongst children’s health outcomes and schooling, first establishing an association between student health and academic achievement and then examining the contribution of school context to student health and wellbeing. The tentative framework that has been established helps to identify relevant indicators to be pursued. Each of these three approaches provides a modus operandi that complements the exploration of schooling and student health and wellbeing. Key messages that emerge from these studies are that (a) associations between self-reports of health and achievement of students are present across schools and these associations vary across schools; (b) school factors are associated with differences in students’ health and academic outcomes; and (c) schools are able to modify their organisational structures and conditions, within a health promoting school framework, to address the health and wellbeing of students.

The quantitative and qualitative results established a link between health and academic outcomes, and the combined results suggest that an integrated focus on student health may further educational achievement. Hence schools can have varying impacts on students’ achievement and health outcomes for those students with differing backgrounds and needs.
Moreover, we found that school contexts have the potential to influence student health and wellbeing and to ameliorate and/or exacerbate the relationship between student-level variables and students’ health and wellbeing. These findings are consistent with those of Ma and Crocker (2007), who argued that the contexts and climates of schools have the potential of channeling students with divergent characteristics into various categories of schooling outcomes. It is possible that some schools may be better able to address the health needs of students, and are also able to ameliorate the relationship between poor health and academic achievement, either by providing individual supports to students, or through broad school programmes and interventions that address health and educational needs.

Yet, the intersection and overlap of individual-level variables, and school variables poses challenges to our interpretations. Social-demographic characteristics of students are not purely individual characteristics but are also partly school characteristics (Kreft, De Leeuw, & Aiken, 1995). These interactions between school inputs (school composition) and processes are complex and are considered to be a function of broader geographic units, such as neighbourhoods (e.g., Sampson, 2003). For example, the social-demographic factors of family wealth, academic achievement, and neighbourhood, included as control variables in the student-level model, could also be proxies of school features, whose effects the study is examining. Academic achievement, an individual-level characteristic, could also be a function of the type of school a student attends. Similarly, neighbourhood, an individual-level variable intended to assess students’ social-demographic circumstances, likely shares the same characteristics of the school students attend.
The findings of this research are suggestive of these interactions, where school factors are in effect intermediaries of the neighbourhoods within which they are located (see Brännström, 2008; Kauppinen, 2007, 2008). Yet the neighbourhood not only affects a school’s social composition but it also determines the prevailing school processes manifest in the school’s educational orientations and normative school ethos (Kaupinnen, 2008). “While inputs and processes both impact outcomes directly, processes may also mediate or moderate the effects inputs have on outcomes” (Palardy, 2008, p. 25).

Accordingly, while problem behaviours and student aggression may represent school processes resulting from how schools are organised and managed, the teaching practices within schools, and the climate schools create for student learning (Rumberger & Palardy, 2004), they are also a function of the social composition of the neighbourhood a school serves. Further, the random effects identified in the research highlight the complex nature of these associations. These random relationships were partially explained by the variability in school factors associated with a school’s academic and socio-economic standing, as well as factors representing the school climate, such as problem behaviours and student aggression.

These complex relationships corroborate the literature suggesting that “rather than there being one single area effect on health, there appear to be some area effects on some health outcomes, in some population groups, and in some types of areas” (Macintyre, Ellaway, & Cummins, 2002, p. 128). The fact that school-level factors either ameliorated or exacerbated the relationships between student-level variables and their health outcomes suggests that schools do have the potential to influence/moderate the relationships between student characteristics and student health and wellbeing through
the conditions schools are able to create. In this sense, the health and wellbeing of students is dependent on the characteristics of the school they attend, in addition to their personal characteristics. These are promising results demonstrating that schools can likely impact the relationships between student-level factors and student health and wellbeing outcomes. While it is generally considered difficult for schools to change the nature of their student composition, schools can play a part in modifying their contexts and processes to improve student academic outcomes (Nash 2003; Raudenbush & Willms, 1995).

While the quantitative results identified the presence of between-school differences in health outcomes, the case studies extended these findings to demonstrate that schools can actually directly address students’ health and wellbeing outcomes. These cases illustrate that the school context is amenable to change through directed school policies, processes, and organisational structures. Further these changes were believed to support students’ health and educational goals. These schools addressed the “opportunity structures in the local physical and social environment” (Macintyre, Ellaway, & Cummins, 2003, p. 130), as represented by the contextual conditions of the school. Opportunity structures are “the socially constructed and socially patterned features of the physical and social environment which may promote or damage health either directly or indirectly through the possibilities they provide for people to live healthy lives” (p. 132).

The notion of health being a product of psychosocial factors implies that results of health promoting activity are not limited to tangible health gains; rather they should reflect an improved ethos or culture within a setting (Whitelaw et al., p. 344). The case studies suggest that HPS initiatives embodied the organic model of a settings approach to
health, whereby a change in a system was made possible through multiple processes and individual actions.

The settings approach to health has been criticised for being used loosely as a label to describe the backdrop of a health promotion initiative or to delineate the physical space without taking into account the setting’s organisational features (Whitelaw et al., 2001). Accordingly, the “health promotive capacity of an environment must be defined in terms of the multiple health outcomes resulting from people-environment transactions” (Stokols, 1992, p. 19) and the key environmental resources or constraints likely to influence personal and collective wellbeing. The elements identified through the case studies constitute the capacity building processes inherent to health promotion initiatives (Hawe, Noort, King, & Jordens, 1997), and the mechanisms required for change to occur. Identifying school factors and conditions that are associated with student outcomes is useful in informing school effectiveness in general and the development of HPS initiatives in particular. The case studies also highlighted the usefulness of qualitative studies as a way to develop conceptual frameworks that could help explain how HPS are conceived and operated.
Conclusion

Research that seeks to identify factors associated with adolescent health and wellbeing contributes to our knowledge base with respect to how schools can become health promoting. For the principles and practices of health promoting schools to become incorporated into school improvement plans, it is important to demonstrate that creating schools and school cultures that promote student learning are not distinct from those that strive to promote the health, and the social and emotional development of their students. Moreover, there is a need to examine how variations in contexts can account for variations in student outcomes. Future studies can then explore those variations to identify the important contextual influences on student outcomes (Duncan & Raudenbush, 1999). Such research is useful to social policy that aims to improve the conditions within settings that are related to improved outcomes.

However, attempts to identify the relationships amongst individual and school factors, and student outcomes continue to challenge researchers. Students’ health and wellbeing result from factors within their own lives and homes, the schools they attend, and the communities in which they live. In order to understand those factors, it is essential to simultaneously investigate student- and school-level variables that may impact health and wellbeing outcomes using statistical models that account for these multiple levels.

It also appears that there is a need to pay attention to what is happening beyond the school boundaries to understand those factors that affect the health of children. There are likely overlapping effects of schools and neighbourhoods on students’ health and wellbeing outcomes, and these effects likely interact with individual factors, school
composition, and school processes. While it is easier to change school processes than to change individual and family conditions (LeBlanc, Swisher, Vitaro, & Tremblay, 2008), it may be possible for schools to address the compositional effects resulting from the neighbourhoods in which they are located through multiple interventions such as those that fall under the HPS banner.

The differential relationships in student health outcomes across schools highlight the importance of paying attention to vulnerable groups when designing health promoting activities in schools. While it is not possible to modify the majority of individual factors (e.g., family structure, gender, wealth), these findings suggest that schools differentially impact the relationships between students’ backgrounds and students’ self-reported health outcomes. School contextual factors that include school policies, processes, and organisational features that affect the social and academic climate of schools seem to hold the most promise for increasing the health outcomes of students. Yet, school contextual variables are quite complex and pose challenges to accurate measurement. School-level effects on student health, which this study has identified, might be attributable to multiple sources operating at levels that make it difficult to capture through surveys (West et al., 2004). The HBSC is no exception. Hence the testing of theory-based, specific hypotheses regarding the processes through which specific area attributes may affect health outcomes needs to be expanded (Macintyre, Ellaway, & Cummins, 2002). This expansion includes better definitions of relevant settings and areas, the variables associated, and improved measurement of each, all of which are fundamental to the ability of drawing causal inferences (Diez Roux, 2004).
The possibility that schools can play an important role in reducing health inequalities among students is quite encouraging for developing HPS initiatives. Although my study provides only an associational model of schooling and health, it demonstrates the potential for schools to influence the relationship between student-level factors, such as economic and social disadvantage, and student health and wellbeing outcomes.

While the school is clearly an environment that is conducive to promoting student health, it cannot fulfill these goals independently and creating health promoting schools should form part of a broader development effort that aims to create a healthy community (Stokes & Mukherjee, 2000). According to Allensworth and colleagues (1995, 1997), such efforts would be more productive through a synergy of mutually reinforcing actions by education, public health, mental health agencies, and community welfare groups to address student health and wellbeing, and student achievement. These actions were evident to varying degrees in the case studies conducted. The competing health and educational goals have the potential to converge when closer links between health initiatives and broader strategies of increased educational outcomes can be established (The Healthier School Partnership Project, 1997), and educational attainment is shown to be linked to health promotion efforts in school (Paulus, 2005).

Health policy experts suggest that improving the health of populations does not lie solely in greater access to medical care but in better investment in individuals’ social and economic wellbeing (Evans, Barer, & Marmor, 1994). Poor mental and physical health interferes with children’s capacity for learning. Moreover, educational attainment is one of the strongest predictors of health (Freudenberg, 2007; Healey, 2004). Therefore, some
argue that reducing inequalities in educational attainment among children entails tackling the health inequalities that exist (Brighouse, 2004, as cited in Healey, 2004).

While the HPS was not intended to address the social and economic circumstances of students, it is an example of a public policy that could address long-term health and social gains. HPS have been proposed as having the potential to improve school achievement and reduce school dropout rates by improving the health of students (Freudenberg, 2007; Patton et al., 2006). Moreover, researchers have called for a closer integration of health and educational activities in advancing the HPS (Dooris, 2005; Paulus, 2005). This study has brought to light the unfolding of such activities and highlights elements of interagency partnerships that are required for achieving schools that are able to promote the health and learning of their students. It is my hope that this study with its three components provides a platform for advancing the health promoting school agenda in Canada at the practice, research, and policy levels.
**Program Sustainability**
- Interagency partnerships
- Joint health and education policies surrounding HPS
- Sustained financial and resource support
- Situating the HPS in MOE mandate
- Inclusion of HPS in school improvement plan

**Student Physical Health**
- Physical space
- Daily physical activity
- Age appropriate games and activities
- Intramurals
- Healthy food choices in vending machines and lunches
- Breakfast programs
- Fruit and snack baskets in classrooms

**Student Emotional Health**
- Participation in extracurricular programs
- Leadership opportunities
- Decision making opportunities
- Peer to peer support
- Inclusive activities
- Fair non-punitive disciplinary climate
- Counseling and guidance
- Tutoring and academic support

**Professional Wellbeing**
- Alignment of curricular expectations
- Professional development around HPS activities
- Resource support
- Collaboration within and across grades

**Community Partnerships**

*Figure 5: Implementation Model of a Health Promoting School*
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APPENDIX A

STUDENT AND SCHOOL MEASURES USED IN THE RESEARCH

Student-Level Outcome Variables and Scales

**Self-rated Health** was assessed by asking students to respond on a four-point scale to the following: Would you say your health is: (a) Excellent, (b) Good, (c) Fair, or (d) Poor?

**Life Satisfaction** was assessed by asking students to rate their life on a ladder where 0 represents the worst possible life and 10 the best possible life.

**The Emotional Health Scale** was derived from the students’ responses to the following questions: (a) I have trouble making decisions; (b) I am often sorry for the things I do; (c) I have confidence in myself; (d) I often wish I were someone else; (e) I often feel helpless; (f) I would change how I look if I could; (g) I often feel left out of things; (h) I often feel lonely; (i) I often have a hard time saying no. Students responded to each item on a 5-point scale (strongly agree—strongly disagree).

**The Subjective Health Complaints Scale** was derived from the students’ responses to the following question: In the past six months, how often have you had the following: (a) headache; (b) stomach ache, (c) backache, (d) feeling low (depressed), (e) irritability or bad temper, (f) feeling nervous, (g) difficulties in getting to sleep, and (h) feeling dizzy. Students selected one of the following five response options for each item: about every day, more than once a week, about every week, about every month, rarely or never.

Student-Level Predictor Variables and Scales

**Gender** was coded as a dummy variable, where 0 = girl and 1 = boy.

**Family structure** was coded such that living with both parents =1 and having other living arrangements = 0.

**Family wealth** was assessed by asking students to respond on a four-point scale ranging from very well off to not well off at all to the following: How well off do you think your family is?

**Academic achievement** was assessed from the students’ responses to the following question: Which of the following best describes your marks during the past year? (a) Excellent (mostly A’s / above 85% / or level 4), (b) Above average (mostly A’s and B’s / between 70 and 84% / or level 3 and 4), (c) Average (mostly B’s and C’s / between 60 and 69% / or level 3), (d) Below average (mostly C’s / between 50 and 59% / or level 2), and (e) Poor (mostly letter grades below C / below 50% / or level 1).

**Neighbourhood Scale** was derived from the students’ responses to the following 6 items on a 5-point scale (strongly agree—strongly disagree): (a) Generally speaking, I feel safe in the
area where I live; (b) The area where I live is a good place to live; (c) People say hello and stop to talk to each other; (d) It is safe for younger children to play outside where I live; (e) You can trust people around here; (f) There are good places to spend your free time (e.g., leisure centres, parks, shops); (g) I could ask for help or a favour from neighbours.

**School-Level Variables and Scales**

*School size* was derived from the school administrators’ report of the school enrolment.

*Number of teachers* was derived from the school administrators’ report of the total number of teachers in the school.

*Student-teacher ratio* was defined as the number of full-time teachers divided by the number of students in the school. One unit on this variable represents a change of one student per teacher.

*School academic standing* was derived from the school administrators’ response to the following question: Relative to other schools, the academic achievement of students at this school is: (a) Far greater than average, (b) Greater than average, (c) Average, (d) Below average, and (e) Far below average

*School socio-economic standing* was derived from the school administrators’ response to the following question: Considering that the average total family income (before taxes) in Canada is about $64,000, how would you describe the average socioeconomic level of the community that your school serves? On a 3-point scale below average, average and above average

*School disciplinary problems* was derived from the school administrators’ response to the following question (on a 4-point scale- not a problem, a minor problem, a moderate problem, a major problem): To what extent are each of the following matters a problem for your school: Classroom disturbances, student absenteeism, student apathy, student physical conflicts, race/ethnic based conflicts, student weapon possession, drop-out, vandalism, verbal abuse of teachers, drug and alcohol use. (Check one response for each statement.)

*Problem Behaviours Scale* included the following five variables: Student absenteeism, apathy, lateness, drop-out, and student drug and alcohol use.

*Student Aggression* included the following five variables: classroom disturbances, student physical conflicts, vandalism, student race/ethnic based conflicts, and verbal abuse of teachers.

*Organisational Health Scale* was derived from the school administrators’ responses to the following questions (on a 5-point scale-strongly agree to strongly disagree): To what extent do you agree with the following statements about teachers in your school?: (a) Teachers at this school seem happy in their work, (b) Teachers in this school have good relations with the community, (c) Teachers in this school are discouraged by the amount of work they have to do,
(d) This school's teachers have high expectations of their students' conduct, (e) This school's teachers and staff are likely to attend student athletic and art-drama, (f) This school's teachers are accessible to students outside of scheduled class time in order to provide help with school, (g) This school's teachers are actively encouraged to participate in the development of school policies, (h) This school organizes and invites parents to presentation-seminars about youth-related issues (discipline, bullying, drug use, etc.), (i) This school encourages parents to participate actively in school-led activities, (j) The atmosphere at this school is generally positive and productive.

School Climate Scale was derived by asking students to respond to the following statements on a 5-point scale (strongly agree to strongly disagree): (a) The rules in this school are fair, (b) I am encouraged to express my own views in class, (c) Our teachers treat us fairly, (d) When I need extra help, I can get it, (e) My teachers are interested in me as a person, (f) Most of my teachers are friendly. The scale was aggregated to the school-level.
APPENDIX B

ELEMENTS OF THE IMPLEMENTATION MODEL

Board-level (Regional) School Health Committee

Institutionalizing the HPS
- Adopting the HPS as a goal
- Incorporating healthy school initiatives into school improvement plans
- Including HPS programs into the professional development of teachers

Inter-agency Collaboration
- Health units and boards of education have staff with expertise, dedicated to HPS
- An organisational structure/chart is drawn to identify the shape the partnership will take and the level of the partnership
- An investment and commitment to the partnership by each sector is outlined
- The partnership is represented by a team of HPS regional/district committee composed of full-time staff from boards of education and school health nurses
- The coordination of funding streams by each sector that would support a long-term strategy is established
- Identification of action areas to be shared by both agencies is developed
- Linkages of action areas to the policy expectations of each sector are identified to ensure alignment of objectives
- Allocation of budget to the HPS initiative that outlines the fiscal and human resources required by each agency
- Incorporation of HPS initiatives into schools’ improvement plans
- Planning for training and support of school health committees, allocation of funding to schools, coordination of resources, and sharing and exchange of expertise across all schools within board jurisdictions

The School Health Committee
- Includes staff, administrator(s), teachers, parents, students, nurses, and community partners (e.g., mental health services, child and youth services, parks and recreation) that are all part of the decision making process
- Designates/elects a school health coordinator who leads the school health committee, provides leadership at the school, and acts as the liaison with the board-level HPS committee
- Identifies school needs, creates priorities, and identifies assets and barriers
- Priorities for development of HPS aims and actions are clearly linked to local school improvement objectives
- Develops a school health plan to achieve a shared understanding of a HPS and that provides a clear list of aims and actions.
- The action plan provides a strategy for improvement in key areas that have been identified as priority projects
- Identification of possible available financial resources to provide the minimum necessary support for the work of the school or team is done
• Resources, including space, are efficiently and effectively organised for use by teachers and students
• Formal and collective decisions made as to how to incorporate HPS into the school day and curricular requirements

Student Emotional Health

Decision making opportunities
• Student representatives are members of school health committee
• Students are involved in making decisions around hot lunches provided for sale, and other foods for fundraising events

Leadership opportunities
• School leadership committees (school council) prioritizes and includes HPS activities such as athletic council, and health and nutrition teams
• Students are recognized as a valuable resource for leading and implementing physical activities
• Peer-to-peer programs, such as lunch monitors, physical activity leaders, and activity buddies, are established

Student participation
• Students with a range of abilities are provided with opportunities to participate in school life and extra-curricular activities
• Students participate by preparing fruit and snack baskets and delivering them to classrooms
• Youth advocacy efforts that promote healthy lifestyles are established (such as students’ contributions to newsletters; theme days)

Creating a positive school culture
• Providing resources to meeting the emotional, physical, and social needs of individual students
• Providing equality of opportunity and a sense of fairness
• Presenting opportunities for students to develop meaningful relationships to feel valued, safe, and secure
• Providing students with supports to enhance their learning (e.g., one to one tutoring, individual counseling)
• Establishing a disciplinary climate that is not punitive
• Handling attendance and discipline problems in a sensitive and caring but authoritative manner to minimise disruption to learning and teaching
• Offering opportunities for group-counseling (e.g., anger management, conflict resolution) and integrating services with other agencies to support students
• Inviting families to participate in special activities at school
• Displaying student contributions to HPS and participation in HPS activities
Physical Health

*Providing a wide range of opportunities for physical activity*
- Improvements to physical space
- Whole-school/classroom fitness breaks (Daily Physical Activity)
- Playground games encouraged by providing grade and age suitable equipment
- Intramurals (non-competitive sports) an option for all grades
- Physical activity encouraged through creative means such as dance, walks in the neighbourhoods
- Affordable after-school programs provided by community partners (e.g., martial arts, yoga, basketball)
- Appropriate space is allocated for DPA, especially during winter, and the creative use of physical space

*Providing equitable and affordable healthy food options*
- Breakfast programs that are available to all students and that are promoted as a healthy way to start one’s day as a way to reduce stigma
- Healthy snack options that are visible and accessible (e.g., fruit baskets in classrooms and hallways)
- Providing healthy snacks after a special physical activity event for all students
- Providing students with healthy snack options in vending machines, if present

*Professional Wellbeing*
- Release time for teachers on school health committees to participate in workshops, and to provide workshops and training for teachers at school
- Support with alignment of curricular expectations when possible
- Teachers receive comprehensive and helpful guidance on implementing HPS activities
- Collaboration and exchange of expertise across grades and subjects
- Collaboration between physical educator specialists and teachers