Understanding Policy-Influencer Perspectives on the Adoption and Spread of Provincial Daily Physical Activity Policies across Canada: A Multiple Case Study

by

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Abstract

Physical activity is an important part of a healthy lifestyle and contributes to improved physical and mental health. In Canada, children are becoming more inactive and are at risk of poor health outcomes and chronic disease. School physical activity policies represent one intervention strategy to address childhood physical inactivity. These policies may set guidelines and requirements for students to achieve a minimum standard of daily physical activity (DPA). The purpose of this multiple case study was to explore: 1) key facilitators and challenges to DPA policy development, adoption and implementation; and 2) the role of policy diffusion in the adoption and spread of DPA policies across Canada. Semi-structured interviews were conducted with fifteen policy-influencers from five case provinces: British Columbia; Alberta; Saskatchewan; Manitoba; and Ontario. Findings from policy-influencer interviews revealed that facilitators and challenges to DPA policy development, adoption, and implementation aligned with four key themes: provincial context; connection between policy expectations and realities; political influence; and ideology and policy change. An analysis of whether diffusion played a role in the adoption and spread of DPA revealed evidence to support policy diffusion through the mechanism of learning. Alternative explanations, such as independent provincial action to address a common issue, also contributed to policy adoption. Overall, research on the factors involved with policy development and diffusion can better inform why and how healthy public policy like DPA can help to address complex public health issues.

Preface

This thesis is an original work by Elizabeth Julia Campbell. The research project received ethics approval from the University of Alberta Research Ethics Board, Project Name: "Understanding the Daily Physical Activity Policy Diffusion Process in Canadian Provinces", No. 49723, 26 June 2015.

The research was part of the POWER UP! Coalitions Linking Action and Science for Prevention (CLASP) initiative, funded by the Canadian Partnership Against Cancer from 2013-2016. The idea for the present thesis project stemmed from a research collaboration led by Dr. Candace I.J. Nykiforuk, Dr. Kim D. Raine, and Dr. Dana Lee Olstad at the University of Alberta. The findings from that initial research collaboration have been previously published: Olstad DL, Campbell EJ, Raine KD, Nykiforuk CI. A multiple case history and systematic review of adoption, diffusion, implementation and impact of provincial daily physical activity policies in Canadian schools. BMC Public Health. 2015;15(385):1-25.

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List of Abbreviations

AB	Alberta
BC	British Columbia
DPA	daily physical activity
MB	Manitoba
MVPA	moderate-to-vigorous physical activity
ON	Ontario
PE/HE	physical education/ health education
QDPE	quality daily physical education
SK	Saskatchewan

Chapter 1: Introduction

Physical activity is an important part of a healthy lifestyle and contributes to improved physical and mental health [1-5]. In Canada, children are becoming more inactive and are at risk of adverse health outcomes across the life course [6-8]. The Canadian Physical Activity Guidelines Canadian guidelines [9], and more recently the Canadian 24-Hour Movement Guidelines, recommend that children and youth (aged 5-17 years) participate in at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily [10]. However, many school-aged children are not meeting the guidelines. For example, findings from the Canadian Health Measures Survey conducted in 2012-2013 [11] indicated that only 9% of children and youth were physically active enough to achieve 60 minutes of daily MVPA and meet the Canadian guidelines. Girls aged 12-17 years were least likely to meet the guidelines. On the other hand, boys aged 5-11 years were most likely to be sufficiently active. Furthermore, results from Canada's 2016 ParticipACTION Report Card on Physical Activity for Children and Youth [12] indicated that Canada was assigned a 'D-' on overall physical activity levels for children and youth based on twelve physical activity measures. The score means that only 20-39% of children and youth are meeting the physical activity guidelines of 60 minutes of daily MVPA [13, 12]. The score for school environment was a 'B', which translates to 60-79% of children and youth having access to physical activity opportunities through school infrastructure, policy, and specialized instruction. In a related study, a global matrix comparing physical activity indicators from a sample of 38 countries revealed that Canada ranked 23rd-30th (tied with eight other countries) for overall physical activity, and 4th-11th (tied with eight other countries) for school physical activity opportunities [13].

In an effort to promote physical activity among Canadian children and youth, a number of provincial governments across Canada have adopted daily physical activity (DPA) policies. These policies set school guidelines and requirements for students to engage in a minimum amount of physical activity during the school day or week [14-18]. Between 2005 and 2010, five provinces adopted DPA policies: Alberta (2005); Ontario (2005); Manitoba (2008); British Columbia (2008); and Saskatchewan (2010) (Figure 1.1). Each provincial strategy is unique, ranging from mandatory policies (British Columbia, Alberta, and Ontario), voluntary guidelines (Saskatchewan), to mandated physical and health education curriculum (PE/HE) (Manitoba). Recognizing these differences, this study will refer to this family of school-based physical activity policies as *DPA policies*.

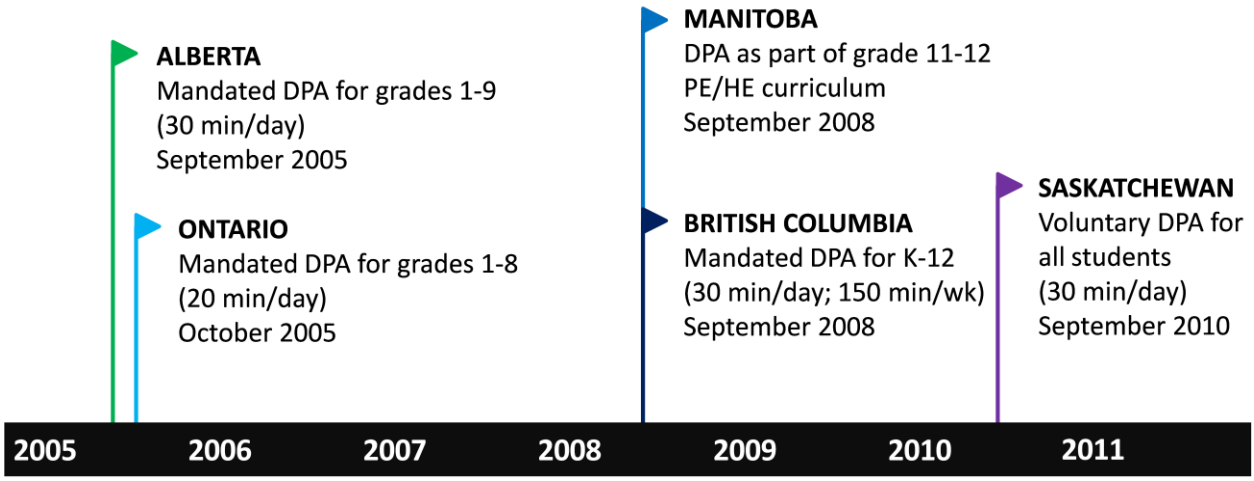

Figure 1.1 Timeline of provincial DPA policy adoption

Population level policies represent one intervention strategy used to address public health issues, such as childhood physical inactivity [19, 20]. Governments have the authority to decide on and implement policies, typically with the intention to improve the public good by addressing prevalent issues facing society [21, 22]. Policy development is influenced by factors such as emerging evidence of an issue, public outcry, media attention, and political will [23]. During policy development, governments may also be influenced by peers in other jurisdictions through the process of policy diffusion [24-26]. Through informal connections with expert groups and neighbouring peers, governments may learn about innovative policies and determine what works before adopting a policy in their jurisdiction.

A complete understanding of school physical activity policy adoption and diffusion is still developing, particularly in the Canadian context [27, 28]. Research on provincial DPA policies has focused on policy implementation and impact [3, 20, 29-42], with few studies considering factors influencing policy adoption [28, 30, 43]. Much of the DPA research has been limited to the DPA policy in Ontario [3, 29-31, 33-41]. Only one study [28] compared DPA policies across Canada, using a document review of key policy documents and applying diffusion of innovations theory to explore how DPA policies spread across jurisdictions. The authors found a research gap in understanding the development, adoption, and implementation of DPA policies, particularly from the perspective of policy-influencers who are most directly involved in these policy processes.

The purpose of this research was to understand the factors underlying the adoption and diffusion of Canadian provincial DPA policies. More specifically, the research aimed to answer the following questions: 1) what facilitators and challenges influenced DPA policy development, adoption, and implementation in provinces across Canada?; and 2) did policy diffusion play a role in the adoption and spread of DPA policies across Canada, and if so, how and through which mechanisms?

In the following chapters I present a review of the literature (Chapter 2), followed by a detailed description of the study methods (Chapter 3). Within this paper-based thesis, each research question was explored separately to comprise two academic papers prepared for peer-reviewed journals, which are presented in Chapter 4 and 5. In the final chapter of this thesis, Chapter 6, I synthesize the overall research findings, present the implications for public health policy and practice, and outline directions for future research.

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Chapter 2: Review of Relevant Literature

Childhood Physical Inactivity

Physical activity is an important part of a healthy lifestyle and contributes to improved physical and mental health [1-5]. Unhealthy behaviours, such as physical inactivity and eating nutritionally poor foods, are associated with chronic diseases such as coronary artery disease, hypertension, osteoporosis, diabetes mellitus, and some types of cancer [3, 4, 6, 7]. These diseases are more common in adults, but disease onset is occurring earlier in the life course, affecting children and youth [3, 8]. Early onset of chronic diseases is associated with decreasing rates of physical activity and increasing rates of obesity in children (age 5-11 years) and youth (age 12-17 years) [3, 8]. Obesity rates in children have increased dramatically from 15% in 1978 to 29% in 2007 [1] and obese adolescents have a 70-80% probability of remaining obese in adulthood [3]. The trend of childhood obesity is increasing and is estimated that by 2040, 70% of adults (age 40 years) will be overweight or obese [1].

Health-promoting behaviours among children and adolescents are associated with healthy lifestyles in adulthood [2, 9]. For example, regular and sufficient physical activity in children and adolescents may positively benefit health and wellbeing [10-12]. Children and youth who engage in regular physical activity are more likely to benefit from lower adiposity, higher muscular strength, improved markers of cardiovascular and metabolic health, and higher bone mineral content and density [4, 12]. Regular physical activity has also been associated with reduced anxiety and depression, improved self-esteem, and positive physical self-concept [4]. As well, students may experience improved cognitive development and academic school performance with participation in regular physical activity [4, 13].

In Canada, the national physical activity guidelines [14] recommend that children and youth participate in at least 60 minutes of moderate-to-vigorous physical activity (MVPA) every day. The guidelines further recommend that children and youth engage in vigorous-intensity activities and muscle-strengthening activities at least 3 days per week. Despite these national physical activity guidelines, Canadian survey data [15] revealed that most school-aged children and youth (aged 5-17) did not participate in at least 60 minutes of MVPA each day in 2012-2013. Of the sample, only 13% of boys and 6% of girls engaged in enough daily physical activity to meet the guidelines. In order for children and youth to reach the physical activity guidelines and benefit from positive health outcomes, further efforts are needed to support physical activity opportunities for children and youth across Canada.

Physical Activity Opportunities for Children in School

Physical Activity in the School Setting

Schools are an ideal setting for health promotion interventions that target children and youth. The benefits of promoting physical activity in schools are two-fold. First, healthy kids learn better and regular physical activity can improve students' academic school performance [4, 13]. Secondly, and described in more detail below, well-designed schools, policies, and programs create supportive environments to foster life-long healthy behaviours [4, 16-18].

In terms of supportive school environments, children and youth spend the majority of their day at school, which creates opportunities for them to develop and practice healthy habits in a supportive learning environment. Educators may work with students over long periods of time to teach and model healthy behaviours. As well, students may also share these habits with their family and community members, thereby promoting health beyond the school environment. Overall, healthy habit formation during childhood may contribute to positive habits and behaviours that transcend into adulthood [4, 16-18].

Governments also play a role in promoting health in the school setting. Ministries of education have the authority to set policies and requirements to benefit the health and learning of all students across the jurisdiction [19]. For example, a number of provincial ministries of education have set physical activity policies and healthy eating guidelines to promote student health and wellness [16, 20, 21]. Policies set at the provincial or territorial level can also have a

wide reach and impact students from schools across the entire jurisdiction [16] and may contribute to equalizing socioeconomic gaps between students [4, 22]. For example, in a physical activity intervention study, researchers found that school health promotion programs equally reached all students, and provided additional benefits to students experiencing obesity and/or socioeconomic disadvantages [22]. Overall, jurisdiction-level policies may reduce barriers and inequalities faced by students because health-promoting services and opportunities are offered to all students equally [4, 22].

Schools have a tradition of promoting and protecting student health, which continues today as school staff provide a holistic approach to child and youth learning and development. Schools have a history of providing students with access to health services, including immunizations, health screenings, and food and nutrition programs [4]. As well, school curricula demonstrate the importance of health and outline opportunities for physical activity during mandatory physical and health education classes. More recently, comprehensive school health [23] has become widely accepted in schools across Canada. A comprehensive school health approach involves providing resources to educators and students to build capacity and develop programs that support educational outcomes, and student health and wellbeing. Applying a comprehensive school health approach may benefit students by providing health-promoting opportunities that address many aspects of health, such as physical activity, healthy eating, and social supports [16, 24, 25].

There are also challenges to using schools as a target for physical activity and health promotion interventions for children and youth. Challenges include: limited resources for educator training; miscommunication and lack of awareness about interventions from school boards and educators; and insufficient facility spaces to implement physical activity programs [4, 26, 27]. Educators also experience pressure from school boards and ministries of education to focus classroom time on academic subjects to ensure students achieve high scores on standardized tests [4, 26, 27]. Unfortunately, an emphasis on academics often comes at the expense of time dedicated to physical and other health promoting activities [4, 26, 27]. Despite these challenges, schools remain an appropriate setting to target health promotion interventions, such as physical activity policies. Overall, school-based interventions reach a large number of children and youth and may promote healthy behaviour, habit formation, and life-long participation in physical activity.

Physical Education Curricula

In Canada, the responsibility for education lies within each provincial and territorial government, each of whom has the authority to develop and adapt its own curriculum [28]. Jurisdictions may also choose to work together when developing curriculum, as demonstrated by the formation of the Western and Northern Canadian Protocol [29]. The agreement was made between ministers of education in British Columbia, Alberta, Saskatchewan, Manitoba, Yukon Territory, Northwest Territories, and Nunavut. In practice, the Protocol means that schools in the Yukon follow the British Columbia Ministry of Education program of studies [30], schools in the Northwest Territories follow a curriculum influenced by the Alberta Education program [31], and schools in Nunavut follow an adapted curriculum based on documents from Northwest Territories, Alberta, Saskatchewan, and Manitoba [32].

Physical education programs are outlined in provincial and territorial education curricula and programs of study. As a result, these programs often vary by jurisdiction. Within each jurisdiction (province or territory), physical education requirements, specifically the amount of physical activity each student receives, can further vary by school district or board, and then also by individual schools, in their implementation of the requirements. A detailed overview of physical education curricula in Canada [33] revealed that many physical education programs include skills development and theory, often sharing curriculum time with health education. The result is limited time for students to engage in physical activity and movement.

Quality Daily Physical Education

Beyond provincially and territorially mandated physical education curricula, jurisdictions may choose to adopt and implement quality daily physical education programs in their schools. In the late 1980s, Physical and Health Education (PHE) Canada, which is a national physical and health education organization, coined the phrase ‘quality daily physical education’ (QDPE) to describe a school-based program that provides all students with opportunities to be active every day [34]. The aim of the program is to foster positive relationships with physical activity that begin in school and last a lifetime.

The elements of a QDPE program include:

- daily curricular instruction for all students (K-12) for a minimum of 30 minutes;
- well planned lessons incorporating a wide range of activities;
- a high level of participation by all students in each class;
- an emphasis on fun, enjoyment, success, fair play, self-fulfillment and personal health;
- appropriate activities for the age and stage of each student;
- activities which enhance cardiovascular systems, muscular strength, endurance and flexibility;
- a participation-based intramural program;
- qualified, enthusiastic teachers; and
- creative and safe use of facilities and equipment.

QDPE is recognized nationally and internationally as a comprehensive strategy to increase physical activity levels of students, however the program has not been formally adopted into policy or curriculum in Canada. Currently, the implementation and success of QDPE lies at the school level, and often depends on key champions to lead the initiative at their school. With the support of PHE Canada many schools have implemented QDPE programs, but it has yet to be universally adopted across Canada.

Daily Physical Activity (DPA) Policies

Currently, five provinces in Canada have province-wide DPA school policies: Alberta (AB); Ontario (ON); Manitoba (MB); British Columbia (BC); and Saskatchewan (SK) [35-39]. The policies vary in minimum daily minutes of activity, type of activity (e.g., MVPA, endurance, strength, and flexibility), reporting requirements, and some policies are mandated across the province while others are not. An overview of the current DPA policies in the five Canadian provinces is presented in the following sub-sections and summarized in Table 2.1.

Alberta – Mandated DPA for Grade 1-9 Students

Alberta was the first province to announce a DPA policy in 2003, but it was not until September 2005 that the policy was implemented in schools for students in grades 1-9 [35]. The mandated provincial policy was established by the Alberta Ministry of Education. Individual school authorities are responsible for monitoring DPA implementation; however, there is no provincial requirement to report results.

As set by the policy, school authorities are required to provide students with a minimum of 30 minutes of physical activity daily, to be organized by the school [40]. The policy also states that DPA should vary in form and intensity, consider differences in students' ability to participate, be realistic and feasible considering available resources, and provide students with an assortment of options to choose from. School authorities have the flexibility to provide DPA to best meet the needs of their students. For example, DPA can be provided during instructional (class time) and non-instructional hours (recess, lunch break), incorporated into other subject areas, and provided in blocks of time that add up to 30 minutes daily. School principals also have the authority to grant DPA exemptions to certain students for religious or medical reasons.

Ontario – Mandated DPA for Grade 1-8 Students

In Ontario, the provincial DPA policy was issued in October 2005 by the Ministry of Education, and full implementation was required during the 2005/2006 academic year [38]. The responsibility of policy monitoring and implementation lies with the school boards, and as in Alberta, reporting to the province is not required. According to the policy, school boards are required to ensure that all students (grades 1-8 in publicly funded schools) participate in a minimum of 20 minutes of sustained MVPA each school day [38]. DPA must be incorporated into instructional time, for example during physical education class or other class time. The Ontario policy requires schools to adapt DPA so that they are suitable for all students, including those with special needs. Exemptions to the policy are not permitted and it is expected that activities are inclusive of all abilities.

Manitoba – DPA as Part of Grade 11-12 PE/HE Curriculum

Unlike the other provinces, the Manitoba Ministry of Education took a different approach to promoting students' participation in physical activity [37]. In 2008, the province mandated physical education class for grade 11 and 12 students. Previously, only students from kindergarten to grade 10 were required to complete physical education credits. The new policy now required all students, from kindergarten to grade 12, to take physical education classes.

The new grade 11 and 12 curriculum outlined that students must complete a physical activity practicum, which consists of a minimum of 55 hours of MVPA per semester. The requirement equates to approximately 32 minutes/day for a five-day week. Students may complete the physical activity practicum during IN-class and OUT-of-class time. IN-class time is

educator-directed and occurs during instructional time, and OUT-of-class time is student-directed and can occur during or outside of school hours. Students require educator or parent sign off for activities completed OUT-of-class time. Students' physical activity participation must be reported to the Ministry of Education with a grade of either complete or incomplete.

British Columbia – Mandated DPA for K to 12 Students

The province of British Columbia released their DPA policy in September 2008, and it was updated later in 2011 [36]. The policy states that all students (kindergarten to grade 12) must participate in daily physical activities to support the development of endurance, strength, and flexibility. Unique to British Columbia, student progress report cards must indicate students' completion of DPA requirements.

DPA can be implemented during instructional and non-instructional school hours, and boards of education are responsible for developing implementation guidelines that are appropriate for their schools. The policy has different requirements for the following grade groupings: elementary (grades K-7); junior high (grades 8-9); and high school (grades 10-12). For elementary students, schools must provide 30 minutes of DPA as part of the school educational program. Junior high schools may either provide 30 minutes of DPA, or require students complete a minimum of 150 minutes/week of MVPA and report their activities. Similarly, in high school, students are required to complete and report a minimum of 150 minutes of MVPA per week, as part of the provincial Graduation Transitions program.

Saskatchewan – Voluntary DPA for All Students

The Saskatchewan Ministry of Education released the *Inspiring Movement - Towards Comprehensive School Community Health: Guidelines for Physical Activity in Saskatchewan Schools* report in 2010 [39]. The document notes the importance of DPA as a way to promote healthy behaviour in all areas of school life, and includes a policy statement on DPA in schools. According to the statement, the provincial government supports and works with school boards to ensure students participate in 30 minutes of MVPA each day. The policy is not mandated in schools across the province. Instead, the Ministry of Education recommends that school boards, schools, youth, parents, and communities work together to develop new, or strengthen current, school DPA policies. The Ministry of Education provided online resources to support implementation in schools [41].

Table 2.1 Summary of provincial daily physical activity policies in Canada (adapted from [42]).

Province	Date Implemented	Grade	Duration, Type, and Delivery	Policy Monitoring and Reporting
Alberta [35, 40]	Sept. 2005	Grades 1-9	• ≥ 30 mins/day • PA should vary in form and intensity • Activities organized by the school; instructional or non-instructional hours	School authorities responsible to monitor implementation; DPA survey of educators conducted by AB Education
Ontario [38]	Oct. 2005	Grades 1-8	• ≥ 20 mins/day • Sustained MVPA • During instructional hours	School Boards responsible to monitor DPA implementation
Manitoba [37]	Sept. 2008	Grades 11-12	• 1 PE/HE course practicum of ≥ 55 hrs • MVPA +≥1 of: strength; endurance; flexibility • IN- or OUT-of-class (with adult sign off)	Students must complete a personal fitness portfolio; teachers document student completion on report cards
British Columbia [36]	Sept. 2008	Kindergarten	• 15 mins/day (half-day); 30 mins/day (full day) • Endurance, strength, flexibility • Instructional or non-instructional hours	School Boards develop their own policies and procedures to track DPA implementation; teachers document student-level achievement on term and final report cards
	Sept. 2008	Grades 1-7	• 30 mins/day • Endurance, strength, flexibility • Instructional or non-instructional hours	
	Sept. 2008	Grades 8-9	• 30 mins/day *OR* 150 mins/wk • Endurance, strength, flexibility *OR* MVPA • Instructional or non-instructional hours	
	Sept. 2008	Grades 10-12	• 150 mins/wk • MVPA • In- or out- of school recorded by student	
Saskatchewan [39, 41]	Sept. 2010 (optional)	All students	• 30 mins/day • MVPA • Delivery method not specified	Boards of Education responsible to ensure that policy results in increased physical activity for all children

Policy Theories

As stipulated in the Ottawa Charter for Health Promotion [43], health promotion actions should include building healthy public policy. However, health promotion researchers and practitioners continue to struggle with applying appropriate theories from political science to study healthy public policies [44]. The follow sections outline two policy theories that have been used in health promotion research, and that are applicable to the current study. The first, the *policy stages framework* [45], is a simplified model outlining the various steps considered in the policy process. The second policy theory considered was *diffusion of innovations* [46], which describes how policies may spread across jurisdictions. By exploring policy theories, researchers and practitioners may better understand the factors involved in policy development and the policy process [47].

Policy Stages Framework

There are a number of different models that have been created to describe the policy process, often referred to a as policy cycle [45]. The policy process is far from linear; it is complex and dynamic – changing over time and dependent on a multitude of social and institutional factors [44, 45, 48]. Some researchers suggest that the stages model is overly simplistic [49, 50]; however, for this study, the framework was considered as a starting point to examine policy in the context of health promotion. When applying the framework in this study, it was understood that multiple policy cycles may exist simultaneously and that the policy process is much messier in reality [49]. In this study, the policy stages framework presented by Howlett and colleagues [45] was used to guide the study of DPA policy process in Canada. The five stages of the policy process are presented below.

1. Agenda-setting is the stage at which problems arise and come to the attention of decision-makers in government. Ideas may come to the attention of policy-makers through the opening of *policy windows*, which are opportunities such as elections, institutions updates, or crises. In this stage, the issue is formally added to a political agenda and considered in the next policy process stages.

2. Policy formulation involves policy-makers brainstorming potential solutions and a course of action to address the issue. The policy formulation stage is composed of three sub-stages: (a) appraisal; (b) dialogue; and (c) formulation. Appraisal entails considering the data and evidence

surrounding the potential solution. Dialogue involves engaging in discussion with key stakeholders who are knowledgeable on topic to better understand the issue and the potential solutions. The formulation sub-stage involves policy- and decision-makers drafting a proposal of the issue action plan.

3. Decision-making is the stage during which one of the proposed policy options is decided upon. The one-time decision to move forward with one policy option is known as policy adoption. At this stage, only those with the policy- and decision-making power have the authority to make the final decision on how to move forward.

4. Policy implementation involves putting the decision into practice. It requires planning and allocating additional funding and human resources. At this stage it is also important that policy details are clearly outlined and easy to understand by those who will be applying and affected by the policy.

5. Policy evaluation is the stage during which members from government departments, non-governmental organizations, and the general public assess how well a policy is working. The findings from a policy evaluation may guide the development of amendments to existing policy, or may result in the termination of ineffective policies.

The policy stages model is not linear; rather it can be considered recursive or iterative (Figure 2.1). Namely, *policy evaluation* does not signify the end of the process, and instead, may represent the start of a new issue that needs to be addressed. For example, evaluation of the implementation and effectiveness of a policy may indicate that certain groups are differentially affected by the policy. The policy will then need to be re-evaluated to address the needs of specific population groups. Though the five-stage policy process may appear linear, some stages may cycle back to a previous step as new evidence emerges or changes in the socio-political context change [45].

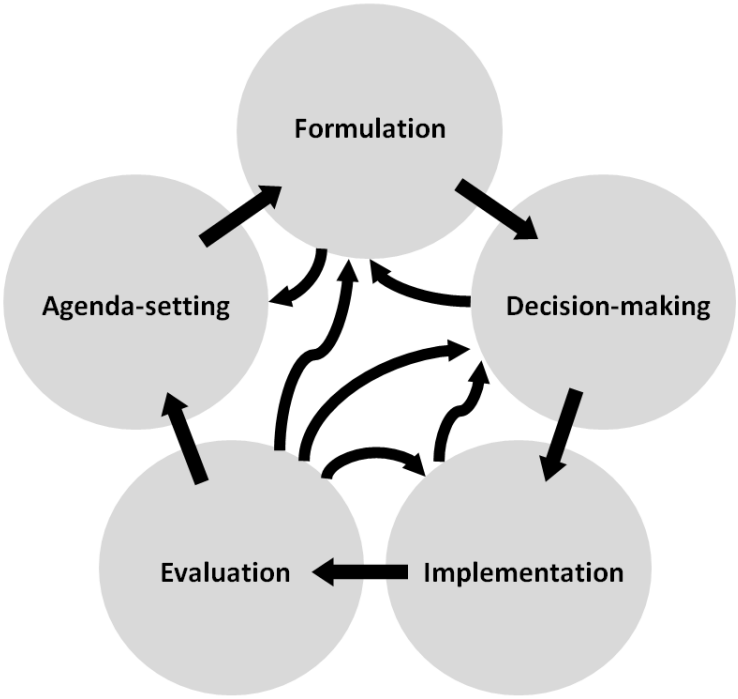

Figure 2.1 Schematic of the policy stages framework, depicting the complex, nonlinear process

Along with the five steps of the policy stages model, it is important to understand the policy actors and policy-influencers (i.e., key people involved), the ideas, and the institutions implicated in the policy process [45]. As Howlett and colleagues [45] describe, key actors involved in the policy process may change over time; varying by number and expertise. The types of actors involved in the policy process may follow an hourglass shape (Figure 2.2), with the widest portions of the hourglass representing the largest group of actors, and the narrow part representing highly specialized decision-makers. Actors in the widest parts of the figure collectively have the largest diversity of knowledge and expertise on the policy issue. This group is called the policy universe and actors are involved in agenda-setting (stage 1) and policy evaluation (stage 5). To narrow the focus of the policy during policy formulation (stage 2) and policy implementation (stage 4), the actors (referred to as the policy sub-system) have specific knowledge and expertise related to the policy context. Finally, the key actors involved in the decision-making stage (stage 3) are the government decision-makers. These people are policy experts working in government and have decision-making power to influence policy adoption. The group is generally the smallest in number compared to the other groups, hence why it is represented as the narrowest part of the hourglass model.

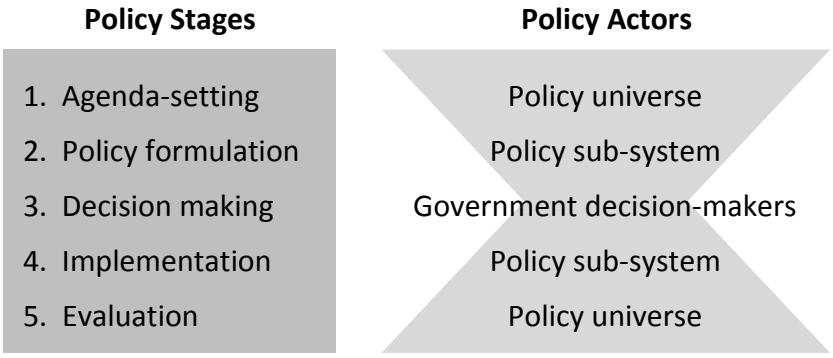

Figure 2.2 Five stages of the policy cycle and key policy actors involved (adapted from [45])

In terms of ideas, or ideology, it is important to understand the political and social ideas and beliefs of the policy setting. Policy theory literature [47, 44, 51] suggests that ideology and values often influence policy development, and can do so either positively or negatively. In the field of health promotion, decision-making and policy development is often based on policy-influencer values, rather than available evidence [51]. This presents a challenge when the ideology of the jurisdiction or government does not align with a new policy and if decision-makers are not receptive to changes. It is therefore important to understand how issues may be framed in order to align with existing ideologies to facilitate policy adoption [49].

Finally, institutions, such as local governments or organizations, play a role in the policy process [45]. Institutions uphold certain structures and ideas that must be considered when developing policies. For example, policies set at the provincial level must align with the policy-making processes set out by these governments, including who has the authority to pass policies and legislation, and at what time points policies can be adopted, for example around elections. In the case of DPA, the actors involved in the policy process come from a variety of institutions, such as provincial government, non-governmental organizations, and schools. Each of these institutions has different ways of developing, adopting, and implementing policy and these factors must be considered during the policy process.

Within jurisdictions, policy actors, ideas, and institutions all interact with each other to influence policy development, adoption, and implementation. However, it is important to also understand how external jurisdictions and governments may influence the policy process, and how policies and ideas may spread beyond provincial governments.

Policy Diffusion

Governments often learn from other jurisdictions about new policies and ideas to determine what works, and what does not, before adopting a new idea [52]. Governments may also be more or less receptive to new policy adoption based on internal factors such as leadership, resources, and past experiences [53]. It is important to understand the differences in potential adopters in order to explore how some jurisdictions seek out and use information, and to target resources to those groups that may require more evidence before adopting a new policy [46, 53]. Rogers' diffusion of innovations theory [46] outlines five different adopter types to characterize different adopters. The five types are: innovators; early adopters; early majority; late majority; and laggards. Innovators are the first to adopt an innovation and must be able to cope with risk and uncertainty. Innovators often have a supply of resources available to overcome unanticipated barriers. Early adopters are next to use an innovation. They are characterized as being respected by their peers, and they often play a role in encouraging adoption by the majority group. The early majority and late majority groups increasingly rely on evidence to support innovation or policy benefits and may even require some pressure before adopting. Early majority adopters make calculated decisions to adopt, while later majority are more skeptical of change. Laggards are the last to adopt a policy innovation and typically require strong evidence of policy efficacy before investing their (often limited) resources into adoption, or they may be pressured to adopt by a higher-level jurisdiction. A final category of adopters is known as the non-adopter. The category describes both those that will never adopt the innovation and those who have yet to adopt a policy and may become later adopters. It is more difficult to describe the characteristics of the non-adopter group as members may actually be quite different in their innovativeness and interest in policy adoption.

Currently, there is limited research on the role diffusion may have played in DPA policy adoption in Canada. A Canadian study [21] of the DPA policy in British Columbia applied the innovation attributes outlined by Rogers to characterize the policy. Specifically, facilitators and barriers to DPA policy implementation aligned with the innovation attributes *relative advantage* (clear advantage in effectiveness or cost-effectiveness over past policy), *compatibility* (policy is compatible with adopters' values, norms and perceived needs, and ways of working), *complexity* (innovation is simple to use, able to be broken down and adopted incrementally), and *observability* (benefits of innovation are visible to intended adopters). The authors concluded

that organizing findings around the diffusion framework may help to target strategies to improve DPA implementation. A later study on DPA [42], to which the present author contributed, involved a document review and the application of Rogers' diffusion of innovations theory to understand policy adopter types of each province. Findings suggested that, of the five DPA-adopter provinces, Alberta and Ontario were innovators, Manitoba and British Columbia were early adopters, and Saskatchewan was early majority. That study highlighted the history and current context of school-based DPA policies and described individual policy adopter characteristics. Despite these two studies, there remained a critical gap in research concerning whether policy diffusion occurred and, if so, by what mechanisms DPA policies spread across Canada.

Expanding on Rogers' diffusion model, researchers have developed policy diffusion models that are focused on health and health promotion settings. For example, Greenhalgh and colleagues [54] developed a conceptual model for policy diffusion in health service delivery and organization. The model was based on a systematic review of empirical research studies, and thus represents a breadth of policy diffusion concepts. The model has been applied in health promotion research in a study of Canadian provincial nutrition guidelines [55]. The authors determined that participant responses aligned with several of Greenhalgh et al.'s policy diffusion model components and deemed that the model was suitable to study policy diffusion in a health promotion context.

The ways by which policies spread between groups and jurisdictions can follow a number of different patterns [52, 56]. Policy diffusion patterns are influenced by various factors such as geography, popularity and/or expertise of innovative groups, or through government and administrative hierarchies [52, 53, 56, 57]. In terms of geographical diffusion, policies may spread from an innovator to other adopters across jurisdictions, based on distance, location, or population size [52, 53, 56, 57]. Another pattern of policy diffusion characterizes later adopters as being influenced by innovators who are seen as popular or as issue experts. Innovative groups that have a successful history of policy innovation and adoption may influence other jurisdictions to adopt an innovative policy, through modeling policy adoption [52, 53, 56]. Innovative policies may also diffuse up or down hierarchies between different levels of government (e.g., provincial to municipal), or across administrative levels (e.g., from a provincial Ministry of Education to a school) [52, 56].

Alternatively, diffusion may not be the driving force of policy adoption; instead, what appears to be diffusion may actually be explained by alternatives, such as independent internal factors, external common shock, or chance [53, 58, 59]. Independent causation describes the distinct factors that may have contributed to policy adoption in each jurisdiction. These include political, economic, or social factors that influence decision-making in the jurisdiction. For example, if a provincial ministry has increased funding, they may invest resources into developing policy. Additionally, political leaders that are champions for an issue may advocate for policy adoption within their jurisdiction, regardless of what their peers are doing. An external event, or 'common shock', may also provide an alternative explanation as to why jurisdictions may adopt similar policies within a relatively short time span. The alternative explanation highlights the potential influence of factors in the wider environment on policy adoption. A common shock may be the announcement of a national or international policy, a catastrophic disaster, or the release of compelling data. Finally, chance or coincidence may explain apparent patterns of adoption, rather than an explanation of diffusion or other mechanisms. The explanation is difficult to substantiate, but provides a possible description for a pattern of similar adoption when no other mechanisms are evident.

Diffusion is an important part of the policy process, however it is often not considered when studying policy in the field of health promotion [57]. By studying diffusion, decision-makers and researchers may gain a better understanding of how policies are developed in a larger context outside of the specific jurisdiction(s) they are being implemented in.

There has been extensive research on the policy stages and policy diffusion frameworks beyond the field of public health; however, the application of these frameworks to the study of health promotion policies, such as DPA policies, is an area that could benefit from further exploration. In the next chapter (Chapter 3: Methods), I outline how the policy stages and policy diffusion frameworks were used to guide the analysis of DPA policy development, adoption, implementation, and diffusion in provinces across Canada. Chapters 4 and 5 present two studies that were conducted to make up this thesis. Chapter 6 concludes the thesis with a synthesis of study findings, implications for physical activity policy and their field of health promotion, and directions for future research.

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Chapter 3: Methods

Study Overview

This thesis is composed of two related studies. Each study is presented as a paper prepared for submission to peer-reviewed academic journals. Given the research aim to understand the processes underlying the development, adoption, implementation, and diffusion of Canadian provincial DPA policies, each study sought to answer one of the two research questions: 1) what facilitators and challenges influenced development, adoption and implementation of provincial DPA policies across Canada?; and 2) did policy diffusion play a role in the development and spread of DPA policies across Canada, and if so, how and through which mechanisms?

The studies both relied on data gathered from a single study design, but differed in the analytic framework and data analysis protocol used to answer their respective research questions. The use of two different data analysis strategies for the same data set was a novel experience for an emerging qualitative researcher to gain experience with both content analysis, and directed-content analysis using an analytical framework. An overview of the similarities and differences between the two studies is also presented in Table 3.1. Details of the methods are presented in the following subsections, along with discussions of ethical considerations, study rigour, and limitations of the study design. I conclude the chapter with an overview of my positionality as a researcher conducting qualitative research.

Table 3.1 Overview of methods for study 1 and study 2

	Study 1 (Chapter 4)	**Study 2** (Chapter 5)
Research question	1. What facilitators and challenges influenced development, adoption and implementation of provincial DPA policies across Canada?	2. Did policy diffusion play a role in the development and spread of DPA policies across Canada, and if so, how and through which mechanisms?
Method	Descriptive qualitative	
Study design	Multiple-case study	
Data collection	Key-informant interviews	
Analytic framework	Policy stages framework [1]	Policy diffusion model [2]
Data analysis	Content analysis	Directed content analysis

Study Design

To answer the two research questions, I employed a descriptive qualitative method to explore factors influencing the development, adoption, implementation, and diffusion of provincial DPA policies. A descriptive qualitative method was chosen for its ability to provide straight descriptions of phenomena of interest [3] and its suitability to study past policy adoption [4]. In this study I sought to describe the factors influencing the DPA policy process and diffusion, rather than determine the effects of the policy or causality using an experimental design [5]. Within a descriptive qualitative method, data collection strategies typically include interviews with a purposive sample of participants and data are analyzed using content analysis [3, 6]. As described in the following subsections, I employed these data collection and analysis strategies to study DPA policies in Canada.

To help focus the study on the bounded phenomenon of DPA policies in Canada, a case study approach [7] was applied within the descriptive qualitative method. A multiple case study approach [4] was used to explore the phenomenon across several cases in Canada to understand the complexities of the policy from the perspectives of multiple provinces. The adoption and spread of DPA policies was the phenomenon of interest in the study, thus each province constituted a ‘case’. For a schematic of the multiple case study design outlining the phenomenon of interest and the five provincial cases, see Figure 3.1.

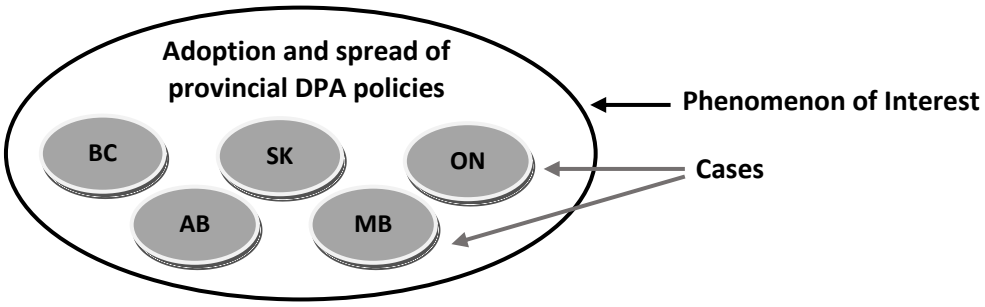

Figure 3.1 Multiple case study schematic depicting the phenomenon of interest and cases

Policy Frameworks

The application of policy theories and frameworks to the study of policies allows researchers to explore the breadth of the policy context and interactions while mitigating researcher biases and presuppositions [8]. There are numerous frameworks and theories from the field of political science that can be applied to the study of the policy process, such as Kingdon's multiple streams framework [9], the REAIM (reach, effectiveness, adoption, implementation, and maintenance) framework [10], the policy stages framework [1], policy diffusion models [2, 11], punctuated equilibrium theory (which describes the general stability of policy making processes interrupted by brief periods of major policy change) [12], and advocacy coalition framework (used to explore the interactions between coalitions and policy actors from a variety of institutions) [13], and. A number of these policy frameworks and theories have demonstrated their suitability in the study of DPA policies and similar health promotion policies and interventions. For example, the multiple streams framework [9] was applied in a study of DPA policies in Alberta, Canada [14] to study how the alignment of the three streams problem, solution, and politics facilitated DPA adoption. As well, the REAIM framework [10] has been used to study the impacts of physical activity and other health promotion interventions and policies globally [15-18]. The policy stages model has been used to study the policy making process of nutrition labelling policy using a case study in Canada [19]. Similarly, the policy diffusion model described by Greenhalgh and colleagues [2] was applied in a case study of provincial nutrition guidelines in Canada to explore policy-influencer perspectives on adoption and diffusion of the guidelines [20].

Based on the options, I chose to use the policy stages framework [1] and the policy diffusion model outlined by Greenhalgh and colleagues [2] to study the development, adoption, implementation, and diffusion of DPA policies across Canada. These two frameworks aligned with the research questions and have demonstrated suitability in similar health promotion policy case studies. More specifically, the policy stages framework [1] was considered a starting point to examine DPA policy in the context of health promotion and answer research question 1. When applying the framework in this study, it was understood that multiple policy cycles may exist simultaneously and that the policy process is much messier in reality [21]. On the other hand, to answer research question 2 and explore policy diffusion, the policy diffusion model outlined by Greenhalgh and colleagues [2] was selected because of its applicability to study policy diffusion in the context of health and health promotion. Details of how the frameworks were used in data analysis are presented in the subsequent *Data Analysis* section.

Data Collection: Key Informant Interviews

Semi-structured interviews were conducted with key informants from each of the five cases between November 2015 and January 2016. In order to attain information rich responses, participants were purposively selected based on their knowledge and experience with the DPA policy adoption process in their province (see *Participant Recruitment* below). Fifteen key informants from each of the five study provinces participated in interviews: British Columbia (n=4); Alberta (n=5); Saskatchewan (n=2); Manitoba (n=1); and Ontario (n=3). Eleven interviews were conducted with individuals and two were group interviews (two participants each), arranged as such upon participant request. Participants included both past and current employees representing provincial government (Ministry of Education or Ministry of Health; n=8), and provincial organizations supporting physical activity in schools (n=7).

All interviews were conducted over the phone at a time determined by the participant. Interviews were scheduled for one-hour and were on average 52 minutes long (range: 34 to 79 minutes). Interviews were digitally recorded to capture audio. Audio files were then transcribed verbatim by a third-party transcriber. I removed identifiable information from the transcripts (e.g., names, positions, specific location names), and coded file names to protect participant confidentiality. A master list with participant names linked to their coded file names was password protected and stored on a secure server at the University of Alberta.

Participant Recruitment

The goal of recruitment was to find potential participants who could provide the richest information on the DPA policy process in each province. Policy-influencers from provincial government and non-governmental organizations were identified through government and organization websites (see Appendix A for a list of online sources). Using publicly available contact information (e.g., phone number or email address) accessible on these websites, potential participants were contacted, provided with information on the research project, and asked if they were knowledgeable about DPA policy in their province. If potential participants self-identified as being knowledgeable about DPA policy development, they were then invited to participate in the study (see sample recruitment email in Appendix B). Snowballing sample [22, 23] was also used, whereby potential participants were asked to share contact information of colleagues who are knowledgeable on DPA policies. The step occurred both during recruitment and at the end of participant interviews, with the question: Can you recommend a colleague that is able to share their knowledge and experience with DPA? During recruitment, when no individual contact information for government or organization staff was publicly available, I sent emails to general information email addresses or to online 'contact us' form submissions, requesting to be connected with a representative who was familiar with the DPA policy process in the province.

For participants to be included in the study, they must have been currently or previously employed with a provincial government department responsible for DPA or with an organization involved with DPA development, adoption, and/or implementation in the province. They must also have been knowledgeable on the DPA policy, DPA policy process, and historical context for DPA policy development, adoption, and implementation in their province. Participants must have also been proficient in the English language to understand and respond to interview questions. Participants were excluded from the study if they did not self-identify as being an expert or knowledgeable on DPA policy in their province.

Interview Guide Development

The interview guide (Appendix C) was developed to gather information from participants on DPA policy development, adoption, implementation, and diffusion. I incorporated elements from the policy stages framework [1] and Greenhalgh et al.'s policy diffusion model [2] to ensure the questions solicited a range of ideas related to the policy stages (agenda-setting,

formulation, adoption, implementation, and evaluation) and diffusion. Questions focused on both the historical context and current status of the policy. Questions informed by the policy stages framework included asking participants: why their organization/government ministry believed it was important to adopt DPA; to describe the adoption process in their province; what factors influenced implementation; and if the policy had been evaluated. Related to policy diffusion, questions focused on asking participants: if they were aware of other provincial DPA policies; if they were influenced by others when developing their policy; if they knew of the policy working well in other jurisdictions; and if their organization/government shared any information around DPA policies with other jurisdictions.

To prepare for the key informant interviews, I performed pilot testing of the interview guide with members of the research team and with one potential study participant. The research team participants were selected as part of a convenience sample and helped to test the timing, flow, and clarity of the interview questions. One potential study participant also took part in the pilot testing to provide feedback on the interview guide's content relevance and use of DPA policy discourse. It was later decided to include the pilot test findings in the data set because there were only minor suggestions to the guide. Feedback from pilot testing was incorporated into the interview guide prior to conducting key informant interviews with subsequent participants. As with a semi-structured interview guide, I used an iterative process to update the questions as new phrases or ideas emerged during the interviews. These new questions were incorporated into subsequent interviews.

Data Analysis

A unique element of the research was the use of two data analysis approaches in two studies to explore DPA policy development, adoption, implementation, and DPA policy diffusion across Canada. A multiple case study approach was common to both studies, with the unit of analysis being each Canadian province that had adopted a DPA policy at the time of the research. Provincial cases were first analyzed separately, and then in a cross-case comparison. Each case provided greater context and understanding of the situational uniqueness of DPA policies within the province. The cross-case comparison allowed for analysis of similarities, differences, and relationships between cases in the study.

With respect to data analysis approaches, the first study, exploring facilitators and challenges to DPA development, adoption, and implementation, was better suited for qualitative content analysis to discover emergent themes. To study diffusion, a directed content analysis approach was used to understand how well DPA policy adoption might have aligned with an existing policy diffusion model. The following sections outline the analytic framework and data analysis procedures used for each study.

Study 1: Policy Development, Adoption, and Implementation & Content Analysis

To explore the facilitators and challenges influencing DPA policy development, adoption, and implementation across Canada, I used qualitative content analysis [24] to code interview transcripts. Content analysis was appropriate due to the exploratory nature of the research. Transcripts were coded and organized using Nvivo qualitative analysis software (QSR International, Version 11). The coding process was informed by procedures described by Mayan [6] and Saldana [25]. Each provincial case was analyzed separately, and then cases were compared in a cross-case analysis in a process described below.

First, I read through the entire transcript to become familiar with participant responses. Codes were created to assign meaning to portions of text within the transcript. Next, codes were organized into larger categories based on similar ideas. Categories were developed based on the transcripts and codes within each province, i.e., I created a different set of categories for each provincial case based on the codes from the province-specific participants (see Figure 3.2). To substantiate the coding and grouping processes, I checked for internal and external homogeneity [6] to determine if codes and categories aligned with each other within groupings (internal homogeneity) and between groupings (external homogeneity). Finally, I conducted a cross-case comparison to organize the categories from the individual cases into themes that were common to all cases. The comparison involved reviewing all categories for each case and then identifying similar ideas across cases and deciding on a few final themes. Because themes encompassed the ideas from many categories and were quite broad in scope, most of the central ideas specific to individual cases were included in the final themes. Themes and categories were kept value-neutral, and codes within the themes and categories may have had value (e.g., category: school-based resources and training; code: lack of DPA resources for educators). Codes, categories, and themes were reviewed by a member of the research team for consistency.

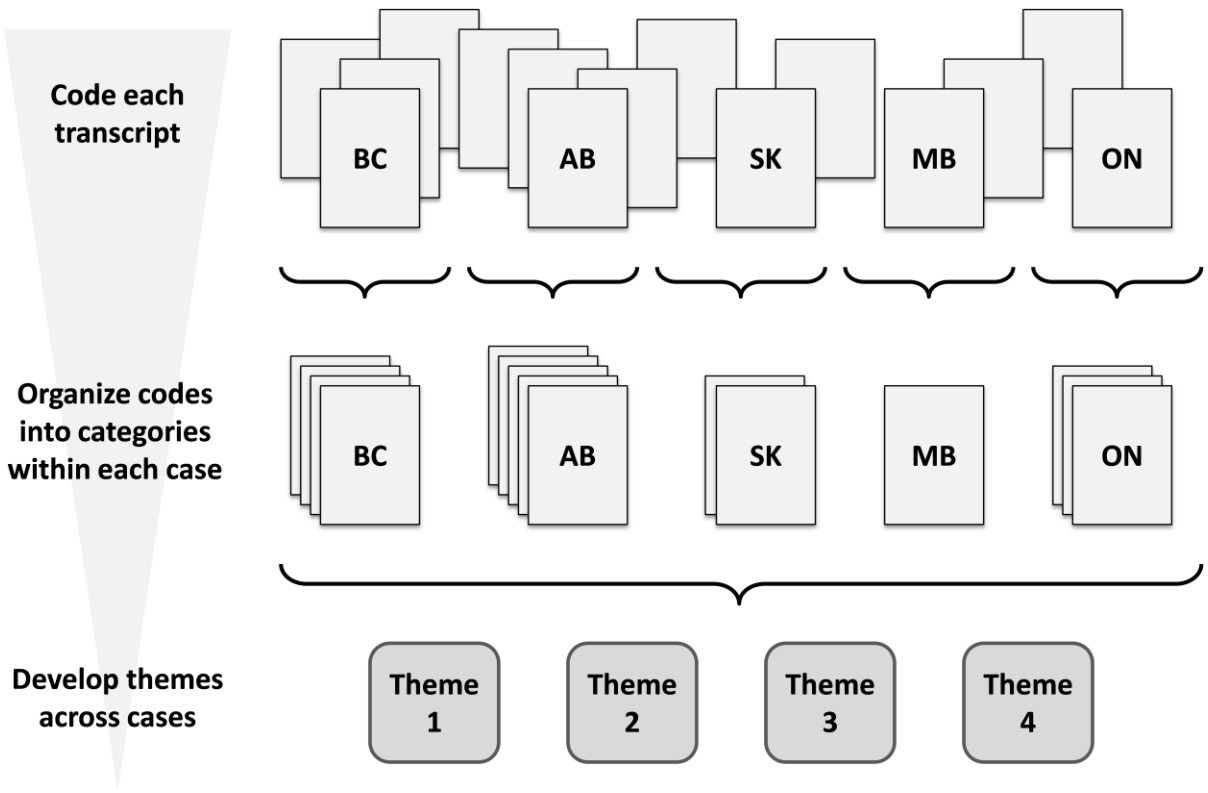

Figure 3.2 Visual representation of the coding and cross-case comparison process for study 1

Study 2: Policy Diffusion & Directed Content Analysis

To investigate the role of policy diffusion in the development and spread of DPA policies across Canada, the policy diffusion conceptual model outlined by Greenhalgh and colleagues [2] was used to explore alignment between key informant interview data and components of the analytical framework. Directed content analysis was useful to further explore and apply policy diffusion theory to understand if and how policy diffusion influenced DPA adoption in provinces across Canada. Greenhalgh et al.'s framework was chosen because the model components were developed from a systematic review of policy diffusion literatures, and were therefore representative of a synthesis of theoretical and empirical findings. The model components were therefore appropriate to guide data analysis and capture the breadth of policy diffusion concepts.

In the study of DPA policy diffusion, I applied Greenhalgh et al.'s model to the directed content analysis [24] of participant interview transcripts. A directed approach to content analysis was employed to compare the policy adoption and diffusion process of DPA policy with an

existing conceptual framework. The suitability of using Greenhalgh et al.'s model as a framework for directed content analysis has been previously demonstrated in the field of public health in a study of Canadian provincial nutrition guidelines [20] and was therefore deemed appropriate for the study of provincial DPA policy.

Using directed content analysis, I first created an *a priori* coding scheme using the attributes and model components from Greenhalgh et al.'s policy diffusion model (for a description of each model component, see Table 3.2). Each transcript was coded using Nvivo qualitative analysis software (QRS International, Version 11 for Windows). I then read through the entire transcript to become familiar with the text. Next, transcripts were coded using the *a priori* attributes from Greenhalgh et al.'s framework to assign meaning to pieces of text within the transcript. Internal and external homogeneity [6] were considered during the grouping process to ensure that ideas within attributes and components aligned within groupings (internal) and between groupings (external). The analysis process and findings were reviewed by a second member of the research team to assess consistency. Results from each case were organized into tables, arranged by Greenhalgh et al.'s model components and underlying attributes. Illustrative quotes were included for each policy diffusion model attribute.

To determine if and how diffusion occurred, policy-influencer interview findings were then compared to theoretical patterns and mechanisms of diffusion [26, 4, 27, 11]. Five mechanisms of policy diffusion were considered in the study: learning; imitation; competition; normative pressure; and coercion [27, 11]. Learning describes the process by which governments gain information about policy success and effectiveness from other governments. Imitation involves copying a policy in order to look like another government, with the focus on emulating the adopter rather than the policy. The imitating adopters perceive the original adopters to be worthy of emulation, regardless of policy effectiveness. Competition, namely economic competition, involves potential adopters being more likely to adopt a new policy if there are economic benefits, particularly if they can get an advantage over their peers. Normative pressure describes when governments adopt a policy because they observe other governments with shared norms adopting a policy first. Coercion describes when a larger, more powerful government incentivizes or forces another government to adopt a policy. Coercion may occur horizontally across similar levels of government, or vertically down from federal government to provincial.

Table 3.2 Policy model components based on Greenhalgh et al.'s policy diffusion model [2]

Model component	Attributes
Attributes of the innovation Perceived characteristics of the policy. May explain much of the variance in adoption rates.	**Relative advantage:** Clear advantage in effectiveness or cost-effectiveness over past policy. **Compatibility:** Policy is compatible with adopters' values, norms and perceived needs, and ways of working. **Complexity:** Innovation is simple to use, able to be broken down and adopted incrementally. **Trialability:** Intended user can experiment with innovation on a limited basis. **Observability:** Benefits of innovation are visible to intended adopters. **Reinvention:** Adopters can adapt, refine, and modify policy to suit their own needs or local context. **Fuzzy boundaries:** The 'soft periphery' or flexibility of an organization may facilitate adoption of an innovation. **Risk:** A high degree of innovation uncertainty discourages adoption. **Task issues:** alignment of innovation with performance of intended user's work facilitates adoption. **Knowledge to use it:** Adoption is more likely if the knowledge required to use it can be transferred from and existing knowledge base. **Augmentation/Support:** innovations with built in support and training are more likely to be adopted.
Adoption by individuals The characteristics of the policy actor who seeks out and interacts with the innovation.	**General psychological antecedents:** Individuals that have traits associated with a propensity to try new things facilitate adoption. **Context-specific psychological antecedents:** Intended users that are motivated and able to use an innovation are more likely to adopt it. **Meaning:** Alignment of innovation meaning with intended adopters' framing facilitates adoption. **Adoption decision:** Decisions to select and use an innovation are dependent on other decisions. **Concerns in pre-adoption stage:** Intended adopters have sufficient information on adoption. **Concerns during early use:** Adoption more likely if intended adopters have continued access to information and training. **Concerns in established users:** Successful adoption more likely if adequate feedback is provided to intended adopters.
Assimilation by the system The complex process of innovation integration into the system. Overlaps with the concepts of system readiness and implementation.	**Assimilation:** the complex process of incorporating an adopted innovation into an organization.

Model component	Attributes
Communication and influence* The various factors that help spread the innovation; ranging from unplanned, informal sharing, to active and organized dissemination.	**Network structure:** Adoption is influenced by the structure and quality of social networks. **Homophily:** Adoption is more likely if potential adopters are similar to each other in terms of socioeconomic, cultural, and professional backgrounds. **Opinion leaders:** People with additional influence over their peers and colleagues. **Harnessing the opinion leader's influence:** It can be challenging to recruit opinion leaders to influence adoption. **Champions:** Individuals who are willing to support an innovation and encourage support from others. **Boundary spanners:** Individuals who are able to link an innovation between different groups and organizations. **Formal dissemination programs:** Planned distribution and promotion of an innovation.
System antecedents for innovation Different jurisdictional and organizational contexts, including structural and cultural, that influence policy adoption.	**Structural determinants of innovation:** Organizations are more likely to adopt if they are large, mature, functionally differentiated, specialized, and have slack resources. **Absorptive capacity for new change:** Organizations that are able to identify, interpret, and reframe new knowledge are better able to adopt and assimilate innovations. **Receptive context for change:** The collective factors that facilitate an organizations ability to embrace new ideas, such as strong leadership, clear strategic vision, and a climate that fosters experimentation.
System readiness for innovation Describes the internal factors related to how ready a jurisdiction is to adopt a policy. A jurisdiction may be amenable to an innovation, but may not be ready to adopt it.	**Tension for change:** If current situation is intolerable, innovations are more likely to be adopted. **Innovation-system fit:** Adoption is more likely if it aligns with an organization`s values, norms, strategies, and ways of working. **Assessment of implications:** Adoption is more likely if the implications and effects of the innovation are assessed and anticipated. **Support and advocacy:** Adoption is more likely if supporters outnumber opponents. **Dedicated time and resources:** Adoption and assimilation is more likely if there is a budget and long-term resourcing. **Capacity to evaluate the innovation:** Innovations are more likely to be assimilated and sustained if evaluation systems are in place.
Outer context: inter-organizational networks and collaboration External factors that influence a jurisdiction's decision to adopt an innovation and its efforts to implement and sustain it.	**Inter-organizational norm-setting and networks:** Organizations are more likely to adopt if similar organizations have already adopted. **Intentional spread strategies:** Formal networking initiatives may facilitate adoption. **Wider environment:** The impacts of the innovation on the wider environment may influence adoption. **Political directives:** Adoption may be facilitated by a policy push and external mandates facilitate adoption.

Model component	Attributes
Implementation and routinization Influences on the early usage of the innovation. Overlap with factors influencing decision-making, organizational development, and assimilation.	**Organizational structure:** Adaptive and flexible organizational structures facilitate adoption. **Leadership and management:** Top management support and advocacy of the innovation facilitate adoption and success of implementation. **Human resource issues:** Implementation and routinization depends on the motivation, capacity, and competence of human resources. **Funding:** Innovation implementation is more likely to be successful if there is dedicated and ongoing funding. **Intra-organizational communication:** Effective communication across departments and organizations facilitates implementation. **Inter-organizational networks:** Complex implementation requires coordination across the inter-organizational network. **Feedback:** Implementation and routinization is influenced by accurate and timely access to information about innovation impact. **Adaptation/ Reinvention:** Innovations adapted to the local context are more likely to be successfully implemented.
Linkage among components of the model The connections between components of the policy diffusion model.	**Linkage at the development stage:** Innovations are more likely to be successful if developers and users are connected during development. **Role of the change agency:** Change agents may facilitate adoption and successful implementation if they are connected with intended adopters. **External change agents:** External change agents may be more successful if they are similar to potential adopters, trained and knowledgeable, and effective communicators.

***** To improve clarity, the component *diffusion and dissemination* was renamed *communication and influence*. The reasoning was that the model component *diffusion* could potentially be used to describe all elements of policy diffusion, rather than focus on various factors influencing communication and policy sharing across jurisdictions.

Alternatively to policy diffusion, patterns of policy adoption may be explained by spurious diffusion [28]. There are a number of alternative hypotheses and explanations [4, 28, 29] that describe the mechanisms influencing policy adoption, irrespective of what peer or neighbouring governments are doing. In this study, we explored three alternative explanations for policy adoption: an external common shock, independent internal factors, and chance [4, 28, 29]. Government responses to an external event, or 'common shock', may explain why multiple governments adopt similar policies in a similar timeframe. For example, the release of a health report with compelling data may independently influence a number of governments to adopt a new health promotion policy. Independent factors internal to the potential adopter may also explain policy adoption if governments decide to adopt a policy irrespective of what their peers are doing. Finally, observed patterns of policy adoption may be the result of chance or coincidence.

Ethical Considerations

Research ethics approval was granted by the University of Alberta Research Ethics Board (Pro00049723, 26 June 2015). All participants provided free and informed verbal consent prior to participating in the interviews. They were provided with an information letter and consent form (Appendix D) in advance of the interview. All participants were deemed to have the capacity and be competent in their ability to understand the research project, the potential risks and benefits, and what was expected of them. We determined that no participants were part of a vulnerable population. There was minimal anticipated risk of harm to participants, meaning a low probability that participants would experience greater harm than what they would encounter during other aspects of their daily life related to the research project [30]. To avoid increased stress and harm, interviewees were allowed to participate in the telephone interview in a location of their choice. The potential benefits to participants included an opportunity to share their knowledge on the DPA policy process, which may help inform other jurisdictions in Canada to develop DPA policies and strategies.

To protect participant confidentiality, interview transcripts were de-identified to remove recognizable information about the participant. Province name was retained as this information was pertinent to how data was aggregated and analyzed in the multiple case study. All participant data was securely stored in the research lab. Digital files were password protected and stored on

a password protected desktop computer. Hard copies of research notes were locked in a filing cabinet in the research lab office space. Digital audio files from the recorder were deleted from the device after they were saved on the password-protected computer server. All file names were coded to protect anonymity. Audio files from digital recorders were deleted after they were saved to the password-protected desktop computer. Members of the research team had access to the original interview transcripts with identifiable information. Interview audio files were shared with a professional transcriptionist, who transcribed the files verbatim. The transcriptionist signed a confidentiality agreement (Appendix E) and agreed to delete all files after use.

Participants were provided with the opportunity to refuse participation in the study and/or withdraw from the study for any reason. Concerning withdrawal, participants had the option to remove and permanently delete their data up until one week after data collection. The timeline was set because after the data was collected, it was quickly transcribed, anonymized, and analyzed. It was therefore not feasible to remove individual data after it was aggregated with other participant data, analyzed, and organized into themes.

Rigour

Methodological rigour is a way to demonstrate that qualitative research has been conducted systematically to avoid bias [6]. I used the following strategies to ensure rigour in my research: an audit trail; consultation with experts and co-authors; and triangulation between multiple sources. An audit trail was kept to record decision-making processes throughout data collection and analysis. Including a tracking and accountability measure ensured that I made thoughtful decisions that aligned with the research project. I also consulted my supervisor and committee members throughout the research process to help identify and mitigate researcher bias and promote dependability during interview question development and data analysis. The result of this consultation process was that I avoided leading questions in the interview guide and employed strategies for self-reflection to reduce bias during analysis. Triangulation was used to promote credibility of the study findings. Findings from the interview transcripts were compared to a previously published systematic review and DPA policy document review [31] to identify areas of divergence and convergence with current literature.

Limitations of Study Design

The study design was limited by studying only positive cases and by exploring policy diffusion at one point in time. Positive cases were selected to narrow the focus of the study on DPA policies. However, limiting the study to current adopters did not allow for an exploration of jurisdictions that may have been influenced by their peers, but did not or have not yet adopted a DPA policy. Studying non-adopters may provide a greater understanding of facilitators and challenges of policy adoption to explain why some jurisdictions did not adopt DPA policies or why others may take more time to decide on policy adoption.

Policy diffusion is a dynamic process that can occur over a number of decades. The study was limited by exploring DPA policy diffusion at one time point. I was only able to describe a snapshot of the current understanding of DPA policy spread and likely did not capture the full diffusion timeline, i.e., all potential adopters. A longitudinal study design may be more appropriate to study policy diffusion over time, but this was unfortunately not realistic within the time constraints of a Master's level thesis project.

Researcher Reflexivity and Positionality

The goal of the descriptive qualitative study was to achieve a comprehensive description of DPA policy events. However, descriptions are heavily influenced by researcher perceptions, inclinations, sensitivities, and sensibilities [3]. As a qualitative researcher, I believe that my own understanding and experiences with DPA policy, health promotion concepts, and qualitative research methods may have influenced the design, analysis, and interpretation of the study findings. As well, my experiences as a participant in and advocate for physical activity, a personal trainer, a coach and sports instructor, and health promoter may have influenced my belief in the importance of physical activity for children and youth. My experiences related to DPA policies are limited by never having worked as a teacher in the education system, or as a policy maker in any level of government, and I have not had the experience of raising children and interacting with the education system as a parent. Therefore, the research I present in the following chapters is a blend of participant responses, information found in grey and academic literature, and my own interpretation of these sources of information.

This chapter provided a detailed description of the methods employed in the study. The following two chapters present the findings after applying these methods. Each study presented in chapters 4 and 5 was prepared for submission to an academic journal, and thus presents a short introduction, overview of methods used, key findings, and a discussion of research implications to practice. As such, these papers are intentionally repetitive of the introduction, literature review, and methods chapters, though distilled into a concise paper for an academic audience.

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Chapter 4: Policy-influencer perspectives on provincial DPA policies across Canada

This manuscript was prepared for submission to BMC Public Health and employed that journal's guidelines accordingly. Supplemental information relevant to the thesis is included in Appendix F.

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Introduction

Physical activity is an important part of a healthy lifestyle and contributes to improved physical and mental health [1-5]. In Canada, children are becoming less physically active and face an increased risk of adverse health outcomes across the life course [6-8]. The Canadian 24-hour movement guidelines for children and youth (aged 5-17 years) suggest that young people partake in at least 60 minutes of daily moderate-to-vigorous physical activity (MVPA) [9]. However, only 9% of school-aged children and youth in Canada meet the guidelines, with girls aged 12-17 years being the least likely to meet the guidelines, and boys aged 5-11 years being the most likely to meet them [10].

School physical activity policies represent one type of intervention used to address childhood physical inactivity [11, 12]. For example, school-based daily physical activity (DPA) policies may set guidelines or requirements for students to achieve a minimum standard of physical activity during the school day or week [13-17]. Between 2005 and 2010, five Canadian provinces adopted DPA policies: Alberta (AB); Ontario (ON); Manitoba (MB); British Columbia

(BC); and Saskatchewan (SK) (Figure 4.1). Each provincial strategy is unique, ranging from mandatory policies (BC, AB, ON), a voluntary guideline (SK), and a physical and health education (PE/HE) curriculum (MB). Recognizing these differences, for the purposes of this paper the collective of school-based physical activity strategies among the five provinces will be referred to as DPA policies. In each province, the policy was adopted by the respective provincial Ministry of Education and implementation was expected in all schools shortly after [13-17].

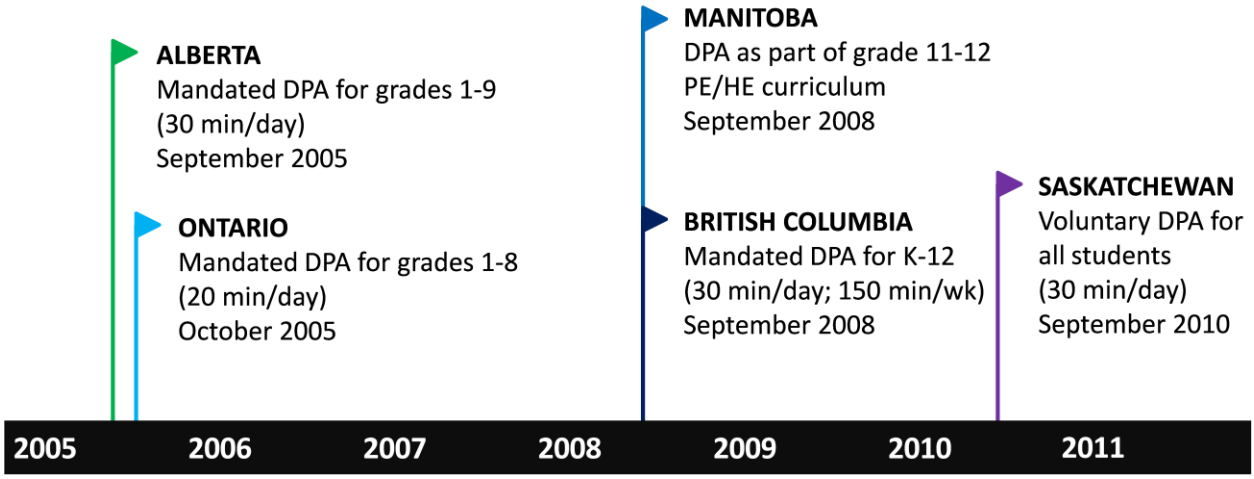

Figure 4.1 Timeline of provincial DPA policy adoption across Canada

Current understanding of school physical activity policy processes is incomplete, particularly in the Canadian context [18, 19]. Research on DPA policy in Canada has focused on understanding policy implementation and impact, mainly in the province of Ontario [3, 12, 20-30], with few studies considering policy adoption processes [19, 30, 31]. Members of this team previously performed a systematic review of implementation and impact of Canadian DPA policies, and compiled timelines detailing key events that preceded adoption of DPA policies in each province [19]. These timelines revealed a research gap in understanding the development, adoption, and implementation of DPA policies in schools, particularly from the perspective of stakeholders who are most directly involved in these policy processes [19]. The current study builds on this previous work, employing a multiple case study to explore facilitators and challenges to the development, adoption, and implementation of DPA policies from the perspective of policy-influencers in each province.

Method

A multiple case study [32] was used to explore provincial DPA policies across Canada. Collectively, the development, adoption, and implementation of DPA policies was considered the phenomenon of interest in the study, thus each province constituted a 'case'. For a schematic of the multiple case study design outlining the phenomenon of interest and the five provincial cases, see Figure 4.2. Semi-structured interviews were conducted with participants from each of the five case provinces. Cases were first analyzed separately, and then concurrently in a cross-case comparison. Each case provided greater context and understanding of the situational uniqueness of DPA policies within each of the five adopter provinces. The cross-case comparison allowed for in-depth understanding of the overall phenomenon through analysis of similarities, differences, and relationships between cases.

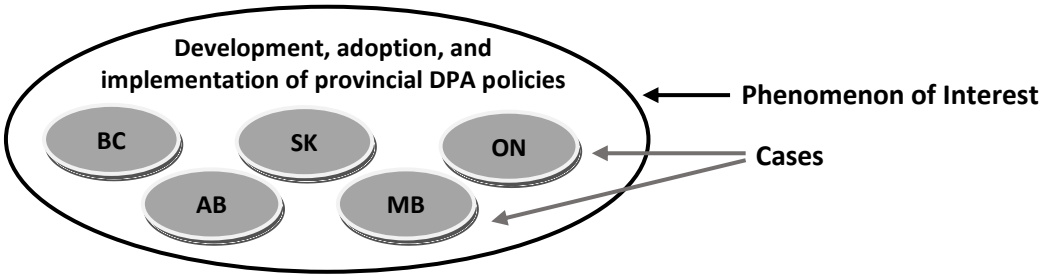

Figure 4.2 Multiple case study schematic depicting the phenomenon of interest and cases

Data Collection: Key Informant Interviews

Semi-structured interviews were conducted with key informants from each of the five cases between November 2015 and January 2016. Participants were purposively selected based on their knowledge and experience with the DPA policy development, adoption, and/or implementation processes in their province in order to provide information-rich responses. Fifteen key informants from each of the five study provinces participated in interviews, with the breakdown as follows: British Columbia (n = 4); Alberta (n = 5); Saskatchewan (n = 2); Manitoba (n = 1); and Ontario (n = 3). Participants included both past and current employees representing provincial government (Ministry of Education or Ministry of Health; n = 8), and provincial organizations supporting physical activity in schools (n = 7).

All interviews were conducted over the phone and scheduled for one-hour (average duration: 52 minutes). Interviews were digitally recorded and transcribed verbatim by a third-party transcriber. Identifiable information (e.g., names, positions, specific location names) was removed from the transcripts, and files were coded to protect participant confidentiality. Research ethics approval was granted by the University of Alberta Research Ethics Board (Pro00049723, 26 June 2015).

Participant Recruitment

The goal of recruitment was to find potential participants who were able to provide the richest information on the DPA policy process in each province. Policy-influencers from provincial government and non-governmental organizations were identified through government and organization websites. Potential participants were recruited using publicly available contact information from these websites. Snowball sampling was also conducted to identify key policy-influencers by asking for recommendations from existing participants and experts in the field (i.e., researchers and representatives from government ministries and physical activity organizations). A multi-pronged approach facilitated identification of the most knowledgeable policy-influencers, particularly those who were previously involved in the DPA policy process at the time of development and adoption, but had since moved on to other positions.

Interview Guide Development

The interview guide was developed to gather information from participants on DPA policy development, adoption, and implementation. The policy stages framework [33] was used to inform interview question development, as the five policy stages (agenda-setting, formulation, adoption, implementation, and evaluation) aligned with the research question to explore factors influencing policy development, adoption, and implementation. Interview questions also focused on both the historical context and current status of the policy. Examples of questions include asking participants: why their organization/government ministry believed it was important to adopt a DPA policy; to describe the adoption process in their province; what factors influenced implementation; and if the policy had been evaluated.

Data Analysis

Qualitative content analysis [34] was used to code interview transcripts. Content analysis was appropriate due to the exploratory nature of the research. Transcripts were coded and organized using Nvivo qualitative analysis software (QSR International, Version 11). The coding process was informed by procedures described by Mayan [35] and Saldaña [36]. Each provincial case was analyzed separately, followed by a cross-case analysis, in a process described below.

First, we read through the entire transcript to become familiar with participant responses. Codes were created to assign meaning to portions of text within the transcript. Next, codes were organized into larger categories based on similar ideas. Categories were developed based on the transcripts and codes within each province, i.e., we created a different set of categories for each provincial case based on the codes from the province-specific participants. To substantiate the coding and grouping processes, we checked for internal and external homogeneity [35] to determine if codes and categories aligned with each other within groupings (internal homogeneity) and between groupings (external homogeneity). Finally, a cross-case comparison was conducted to organize the categories from the individual cases into themes that were common to all cases. The comparison involved reviewing all categories for each case and then identifying similar ideas across cases and deciding on a few final themes. The resulting themes were common to all cases, however some categories within themes may have been representative of most, but not all cases. Findings were retained that were unique to and representative of each case, but that were also comparable across cases. Themes and categories were kept value-neutral, and codes within the themes and categories may have had value (e.g., category: school-based resources and training; code: lack of DPA resources for educators). Codes, categories, and themes were reviewed by a member of the research team for consistency.

Strategies to ensure rigour included an audit trail, consultation with experts and co-authors, and triangulation between multiple sources. An audit trail was kept to record decision-making processes throughout data collection and analysis [35]. Co-authors were consulted to help identify and mitigate researcher bias and promote dependability during interview question development and data analysis. Triangulation was also used to promote credibility of the study findings. Findings from the interview transcripts were also compared to a previously published systematic review and DPA policy document review [19] to identify areas of divergence and convergence with current literature.

Results

Four themes related to development, adoption, and implementation of DPA policies emerged from the analysis of interview transcripts: provincial context; connection between expectations and implementation realities; political influence; and ideology and policy change. A summary table with illustrative quotes is presented in Appendix F.

Provincial context

Provincial context influenced policy development and adoption by fostering a supportive policy environment. Across all cases, participants provided examples of province-wide initiatives and resources that facilitated policy development, adoption, and implementation. For example, in both British Columbia and Manitoba, there was evidence of efforts to address the issue of childhood health and physical activity based on provincial reports. For example, in British Columbia: "Our provincial health officer had issued a report... in 2003 called An Ounce of Prevention. And it... helped to kick-start a cascade of different initiatives where there was a stronger focus on health in the school setting" (BC). Participants from Alberta described how having relatively larger and resource-rich provinces positively influenced adoption. For example, a participant suggested that Alberta Education "has a larger number of people working, permanent staff working than other ministries" (AB). The large number of provincial government staff was viewed as a benefit to policy development because more staff was available to plan and actualize the policy. Meanwhile, a participant from the proportionately smaller (population-wise) province of Saskatchewan claimed that the smaller number of staff within the Ministry of Education was supported by non-governmental groups and organizations, which facilitated the development, adoption, and implementation of the DPA policy.

Conversely, in Ontario, the idea that "Ontario's a massive province" (ON) was seen as a challenge to DPA implementation. Participants suggested that it was not possible for the provincial government to oversee DPA implementation in all 72 of the school boards across the province. Another challenge experienced in Ontario was the large size of the provincial government. One participant suggested that provincial ministries often do not communicate with each other and instead work in 'silos', resulting in overlapping policies and initiatives: "I think that's probably one of the biggest issues that we face in the province, is just the overlapping policies and initiatives versus focusing on deeper implementation of existing policies" (ON).

Connection between policy expectation and realities

The multiple case study revealed that DPA policies were developed by each province's Ministry of Education with implementation downloaded to educators in schools. However, the connection between policy expectations at the provincial government level and actual implementation in schools varied across cases. In the provinces of British Columbia, Alberta, and Ontario, some participants claimed DPA policies were set at provincial level, but implementation was the responsibility of the school boards in order to allow for flexibility to meet the local needs of educators and students. For example, in Alberta one participant stated: "The policy was…created by Alberta Education, but it's the responsibility of the school jurisdictions and the superintendents within those jurisdictions to ensure that the policy is being mandated" (AB). In some provinces, this gap between provincial government policy expectations and implementation challenges in schools was filled by the support and involvement of provincial physical activity organizations. In British Columbia, Alberta, and Ontario, provincial physical activity organizations acted as liaisons between Ministries of Education and school boards. These organizations advocated for improved resource provision to support DPA. For example, after adoption of the DPA policy, one provincial physical activity organization went so far as to collect school board money allocated for DPA implementation to develop centralized educator training and resources for the province. On the other hand, a participant from Manitoba suggested they experienced fewer challenges during implementation because the Ministry of Education consulted educators during policy development, and "by doing that [teacher consultation] we also got buy-in right from the start. So it was a pretty smooth implementation" (MB).

Challenges described included the power imbalances between the provincial government and educators responsible for implementation. In Ontario, DPA was colloquially referred to as a 'thou shalt' policy, demonstrating the authority of the provincial government: "This policy is a 'thou shalt' policy. It's part of the curriculum and it's a part of the Education Act, so it is a requirement. It's not voluntary. It's not optional. It is a mandatory requirement" (ON). The top-down mandate of DPA from government to schools contributed to implementation challenges because educators felt pressured to provide DPA, but may have lacked the resources to do so.

Despite the mandatory nature of the policies, all provinces faced challenges with implementing DPA in schools and no province reported complete implementation in schools. For

example, in British Columbia, estimates for implementation ranged from "60-65% of the school and school administrators legitimately implement the DPA policy... but there's still a long way to go" (BC). Similarly, a participant from Manitoba stated that "continued implementation is a problem too…the continued support could use a little more attention" (MB). In Saskatchewan, challenges to DPA implementation included contradictory expectations from the Ministry of Education for educators trying to teach curriculum and implement DPA. For example, one participant suggested that DPA was no longer a priority in schools because "the expectation from the Ministry [of Education] level is get those language arts scores up... that's all they do is language arts at the expense of everything else" (SK). Overall, participants from each province shared similar sentiments that "[DPA has] maybe just not lived up to expectations" (ON).

Political influence

Political influence, including political will and policy windows of opportunity associated with provincial elections, facilitated policy adoption by putting DPA on the political agenda. In Ontario and Saskatchewan, DPA was outlined in election party platforms and the new policies were announced shortly after provincial elections. In Ontario, this type of policy development was described as typical within the province: "It's a political decision. The political team would have done their research and their consultations... it's similar to many of the policies that we have in that it's part of a guided direction from the government at the time" (ON). Though not directly part of a commitment made during a provincial election, a participant from Manitoba suggested that DPA policy may have been made possible when the provincial governing party changed: "When the new government came in, I think there was a quite a lot of support for promoting active healthy lifestyles in schools" (MB). Similarly, in the provinces of British Columbia and Alberta, political influence from leaders and bureaucrats within the provincial government, and specifically within the Ministry of Education, facilitated policy development and adoption. For example, in British Columbia, "Our minister at the time... was quite supportive of [DPA]... there was definitely a lot of political will around it" (BC). Meanwhile, in Alberta, the Minister of Education was a key champion in DPA development due to his belief in the importance of childhood physical activity and his views on the existing physical education program of study: "[The Minister of Education] had been very clear: he hated phys ed... he wanted it to be fun, he wanted it to be engaging" (AB).

However, political will and influence were also described as a challenge in some cases. For example, in Alberta, one participant suggested the intentions behind DPA adoption may have been political, rather than evidence-based: "DPA could be done and it could make the Minister look good" (AB). Similarly, a participant from Saskatchewan indicated that the DPA announcement may have been made to gain political support during an election. The policy announcement was described a shock for education stakeholders and educators, who did not play a large role in policy development. A participant from Saskatchewan described DPA adoption as: "It just happened. It was in an election time and all of a sudden [DPA] was just there... we had no idea it was coming" (SK).

Ideology and policy change

Across all cases, DPA policies were framed as a solution to the problems of chronic disease (British Columbia and Ontario), childhood obesity (Manitoba), and childhood physical inactivity (Alberta, Saskatchewan, and Manitoba). For example, in British Columbia, one participant claimed that "the government saw this [DPA policy] as our way of prevention and reducing the number of chronic diseases that will be seen from our children" (BC). The framing of DPA around promoting childhood health was described as aligned with the values and beliefs of participants and other policy-influencers during policy development. For example, in Saskatchewan, a participant stated: "I never ran across anyone, I'll just speak from the ministry level. I never ran across anyone that disagreed that physical education and physical activity wasn't important" (SK). Similarly, the ideology in Alberta and Saskatchewan was that DPA policies were considered "the right idea" (AB) and having "real value" (SK). Despite the belief in the importance of DPA for students, participants acknowledged that DPA implementation was incomplete (see theme: *connection between policy expectations and implementation realities*). All participants suggested that their provincial DPA policies would likely remain in place, although participants in British Columbia, Alberta, and Ontario suggested that discussions were underway within Ministries of Education to consider revising the policies.

A challenge to policy change and revision was the tension between policy-influencer ideology and the evidence of incomplete policy implementation across schools. The strong belief in the importance of physical activity and health promotion in children was demonstrated as a moral attachment to the DPA policy by participants from British Columbia, Alberta, and Ontario.

For example, despite evidence of ongoing challenges related to implementation of DPA policies, some participants expressed their reluctance to revise or revoke their policies. Participants from British Columbia and Alberta captured this idea when they said: "It would be too bad if [DPA] was just taken away…even if it's not perfect" (BC); and "I'd rather have a DPA policy than not" (AB). Participants perceived that revoking the policies was admitting to failure. For instance, according to one participant from Ontario: "[DPA is] one of our signature policies…it would take a lot of guts to basically say 'you know this whole DPA thing, yeah we kind of got that wrong'" (ON). The tension around policy change was present in participants' responses; however, participants also alluded to current plans and ideas to update DPA policies. Potential policy change options described by participants included: changing DPA from a policy to a guideline, similar to the provincial food and beverage guidelines (BC); updating the wording and phrasing in the policy document to promote continuous physical activity throughout the school day, rather than having a defined start and end time for activity (AB); and breaking down the DPA requirement into smaller segments throughout the day, i.e., a 20-minute DPA requirement could be met in two 10-minute blocks of activity (ON). Overall, participants believed in the importance of the policy to improve childhood health, but felt that if policy change was to occur, it was important to revise the policies rather than to revoke them.

Discussion

The study contributes to an increased understanding of facilitators and challenges to development, adoption, and implementation of DPA policies across Canada. We found that *provincial context*, the *connection between policy expectations and realities*, *political influence*, and *ideology and policy change* are factors that work together to help explain the emergence of DPA policies in five Canadian provinces. Though the direction of influence for each theme varied across cases, each concept retains importance for evaluating current DPA policies and developing future healthy public policies.

Findings from this study align with extant literature describing facilitators and challenges associated with DPA policies. Within the theme *provincial context*, provincial size, availability of additional resources, and past experiences with similar initiatives influenced DPA policy adoption. It was expected that larger, resource-rich jurisdictions and organizations would more readily adopt new policies due to greater availability of experts and supportive resources [37].

From our study, participant responses from the greater-populated provinces of British Columbia, Alberta, and Ontario aligned with this expectation. However, participants from Ontario described additional challenges with coordination of resources across their province, indicating that size alone is not indicative of policy adoption. Furthermore, we found that the lesser-populated province of Saskatchewan was able to adopt a DPA policy despite a limited availability of supportive resources. Development and adoption were facilitated by the collaborative nature of government ministries and physical activity organizations; however, the voluntary policy did not have any accompanying financial resources to support implementation. Overall, our findings align with research that suggest that policy making is influenced by such factors as available resources, past experience, and ideological interests [38].

In terms of the theme *connection between policy expectations and implementation realities*, there are a number of studies in Canada that highlight the gap between policy expectations and implementation realities. Literature on Canadian DPA policies [3, 12, 20, 25, 28] found the DPA has not been fully implemented in all schools across adopter provinces. For example, findings from a research project in Ontario indicate that less than half of students were provided with opportunities for DPA every school day [12, 20]. Similarly, based on DPA policy research conducted in British Columbia [11, 39], the percentage of teachers and principals who perceived their schools as fully implementing DPA ranged from 14-90%. Furthermore, the studies indicated that there was a significant gap between policy expectations (i.e., 100% implementation), and the realities of low activity rates and widely varied perceptions of DPA implementation in schools across British Columbia.

Challenges to implementation described in the DPA policy literature include educator time and resources [11, 24]; lack of clarity and confusion with policy expectations [11, 24]; tension and disconnect between the Ministry of Education and educators, as evidenced by labour turmoil and administrative staff turnover [22]; and no monitoring of policy implementation [23]. Solutions to improve implementation could involve increasing educator resources and training [24], providing long-term resources that promote sustainability [21], and developing and executing policy evaluation plans [21]. Though much more detailed, these findings align with participant quotes on potential challenges to DPA implementation in the case provinces across Canada, namely challenges associated with resource provision, long-term policy implementation and maintenance, and educator time constraints.

On a larger scale, the connection between policy expectations and implementation realities aligns with DPA [40] describing fragmented physical activity policies in Canada. The authors call for a collective action and a coordinated approach to engage stakeholders at multiple levels to support policy development and implementation. Furthermore, efforts need to be made to improve policy coordination across different agencies [38], such as across ministries (Health and Education) and between government and physical activity organizations.

Study findings revealed that DPA policy adoption was influenced by elected politicians and prominent Ministers of Education, as captured by the theme *political influence*. A study comparing DPA to a walk to school policy in Alberta [31] found that the political influence of the Minister of Education facilitated DPA adoption, whereas a lack of political support prevented the adoption of the walk to school policy. Similarly, in a study of DPA policy development and implementation in Ontario [30], political influence played a large role in DPA policy development by facilitating agenda setting and policy adoption. However, the authors propose that a challenge with government policy adoption is that politicians tend to focus on short-term solutions to chronic issues. A lack of long-term support and interest in a policy may explain why efforts to promote DPA in provinces across Canada have been intermittent or tied to key events, such as elections. However, efforts need to be made to ensure long-term commitment and coordination of policies to increase physical activity participation in Canada [41].

The influence of political leaders on policy development acts to maintain the notion that politics and policy-making is limited to a few powerful elites [42]. In the case of Ontario, one participant's referral to the DPA policy as a 'thou shalt' policy supports this traditional top-down approach to policy. Instead, researchers [42] believe that the power from political leaders needs to be shifted to promote bottom-up, community-based approaches to engage all members of society in the policy-making process. For DPA, this means seeking educator, parent, and student input during policy development, adoption, and implementation and moving away from traditional top-down policy approaches. Furthermore, taking a policy-making approach that involves community members and citizens may benefit policy accountability [43].

The theme *ideology and policy change* was concerned with policy-influencer and provincial government ideology towards DPA. In the present study, participant policy-influencers believed in promoting student physical activity and reducing chronic diseases.

However, findings from studies across Canada involving interviews and surveys with school staff suggest that some educators had differing philosophies towards DPA. In one study set in British Columbia [11], DPA aligned with school philosophy, which facilitated policy uptake and implementation. Conversely, a barrier to implementation in some schools in Ontario [22, 24] was educator philosophy towards school-based physical activity. Findings revealed that some educators believed they were only responsible for academic programs of study, and that parents and communities should take on the responsibility of promoting physical activity for their children. These findings highlight the need for increased school supports to promote a holistic approach to teaching, such as through comprehensive school health (CSH) or healthy eating and active living (HEAL) approaches [44]. Better alignment and integration of health and wellness in schools, especially through evidence-based programs, may foster school philosophies that value providing physical activity opportunities and training resources for educators.

More generally, the policy theory literature [45-47] suggests that ideology and values often influence policy development, both positively and negatively. In the field of health promotion, decision-making and policy development is often based on policy-influencer values, rather than available evidence [47]. Furthermore, policies are sometimes merely symbolic projection of a government's concern, or address a tangible yet insignificant element of a more complex problem [45, 48]. One may believe that governments are taking action on an issue of public health concern, when in reality little has changed. Similarly, and in alignment with the theme *political influence*, our findings suggested that DPA was put on the political agenda to gain votes (SK) and to make a minister look good (AB).

Strengths and Limitations

To our knowledge, this is the second study to compare DPA policies across Canada [19], and the first to include the perspectives of policy-influencers from DPA adopter provinces, helping to address a significant gap in the current literature on DPA. Findings may be transferable to other jurisdictions across Canada due to the variability of jurisdictions and policies considered in the present study.

The study was limited by a small sample, due to a limited pool of potential participants and recruitment challenges. There are few DPA policy experts across Canada, and it was a challenge to identify and recruit multiple policy-influencers from each case. In one case (MB),

only one policy-influencer participated in an interview. Despite the low number of participants, the included key informants were able to provide rich descriptions of the factors influencing DPA policy development, adoption, and implementation. To expand the scope of the study and achieve a larger and more diverse pool of participants, it may be beneficial to include school administrators. Some participants spoke about the role superintendents played during policy development and consultation in some provinces. Future research is therefore needed to better understand the stakeholders and policy-influencers involved outside of provincial government and physical activity promotion organizations. Schools administrators, educators, parents, and students are key DPA stakeholders and have a more detailed understanding of the factors influencing implementation of DPA policies.

Conclusions

This study contributes to an increased understanding of facilitators and challenges related to development, adoption, and implementation of school-based DPA policies across Canada. Findings suggest that *provincial context*, the *connection between policy expectations and realities*, *political influence*, and *ideology and policy change* shaped development, adoption, and implementation of DPA policies in schools. Though the direction of influence for each theme varied across some cases, each concept is important to consider when studying and developing future DPA and other health promotion policies for schools. Further research and policy practice should consider how jurisdictional context, policy expectations and implementation planning, political influence, and policy ideology contribute to and influence the policy cycle.

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Chapter 5: Did diffusion occur? Exploring the spread of DPA policies across Canadian provinces

This manuscript was prepared for submission to the International Journal of Behavioral Nutrition and Physical Activity (IJBNPA) and employed that journal's guidelines accordingly. Supplemental information relevant to the thesis is included in Appendix G.

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Introduction

Healthy public policy is a key factor in creating supportive conditions for promoting health. For example, children and youth may benefit from increased opportunities for physical activity through schools policies that promote daily physical activity [1, 2]. Across Canada, a handful of provinces have adopted policies that set out school guidelines and requirements for students to achieve a minimum standard of daily physical activity (DPA) [3-7]. Each provincial strategy, herein referred to as 'DPA policies', is unique – including mandatory policies (BC, AB, and ON), voluntary guidelines (SK), and mandated physical and health education curriculum with a physical activity practicum (MB). All policies were adopted between 2005 and 2010, with implementation in schools following shortly after. Though there are many similarities between policies, it is unclear if and how these provincial governments were influenced by each other during policy adoption.

There are few examples of governments making policy decisions based on internal factors alone [8]. Instead, governments are more likely to learn from other jurisdictions about what works (and what does not), before adopting a new idea. Policy diffusion is the process by which governments may learn from each other about innovative policy ideas. Rogers' diffusion

of innovation theory [9] first described this process, and it has since been adapted over time to the fields of health and public health [10]. By studying policy diffusion, decision-makers and researchers may gain a better understanding of how policies are developed in a larger context outside of the specific jurisdiction it is being implemented in [8, 11-13].

Diffusion is an important part of the policy process, yet there is limited research on the role diffusion may have played in DPA policy adoption in Canada. A study on the province of British Columbia's DPA policy [1] applied Rogers' diffusion of innovations theory to characterize the innovation attributes of the policy. Specifically, facilitators and barriers to DPA policy implementation aligned with the innovation attributes *relative advantage* (clear advantage in effectiveness or cost-effectiveness over past policy)*, compatibility* (policy is compatible with adopters' values, norms and perceived needs, and ways of working)*, complexity* (innovation is simple to use, able to be broken down and adopted incrementally)*,* and *observability* (benefits of innovation are visible to intended adopters). The authors concluded that organizing findings around the diffusion of innovations framework may help to target strategies to improve DPA implementation. Another study comparing DPA policies across Canada [14] applied diffusion of innovations theory to findings from a document review to categorize the policy adopter types of each province. In a study of adoption and implementation of provincial nutrition guidelines [15], the authors used Greenhalgh et al.'s policy diffusion framework [10] to guide analysis of key informant interviews. The study highlighted the utility of a directed content analysis approach and the use of Greenhalgh et al.'s model [10] as an analytic framework.

Given that jurisdictions can learn from each other's experiences in implementing policy solutions to public health problems, it is critical to understand the circumstances leading to the adoption and spread of policy from one jurisdiction to another [8, 11, 13]. Therefore, the purpose of this research was to investigate the role of policy diffusion in the adoption and spread of DPA policies across Canada. To assess the extent to which diffusion occurred, this paper considers evidence to support both policy diffusion, and alternative explanations.

Methods

Design and Analytical Framework

A multiple case study design [16] was used to examine provincial DPA policy across multiple cases in Canada. The adoption and spread of DPA policies was considered the phenomenon of interest in the study and the DPA policies were the 'innovation' examined. The unit of analysis was each Canadian province that had adopted a DPA policy at the time of the study in 2015. To better understand DPA policy diffusion, key informant interviews were conducted with policy-influencers from each of the five provincial cases. Transcripts from each case were first analyzed independently, and then a cross-case comparison was conducted to assess similarities, differences, and relationships between cases in the study.

To investigate the role of policy diffusion in the development and spread of DPA policies across Canada, the conceptual model outlined of policy diffusion by Greenhalgh and colleagues [10] was used to guide interview question development and data analysis. The elements of Greenhalgh et al.'s framework represent a synthesis of theoretical and empirical findings from a systematic review of the policy diffusion literature. The model, as suggested by the authors, was not used as a 'prescriptive formula', but rather the elements were used to guide data analysis to capture the breadth of policy diffusion concepts. Descriptions of the model components and their underlying attributes are presented in Table 5.1. However, note that for clarity, the component *diffusion and dissemination* was renamed *communication and influence*. The model component *diffusion* could potentially be used to describe all elements of policy diffusion, rather than focus on various factors influencing communication and policy sharing across jurisdictions [10].

Table 5.1 Policy model components based on Greenhalgh et al.'s policy diffusion model [10]

Model component	Attributes
Attributes of the innovation Perceived characteristics of the policy. May explain much of the variance in adoption rates.	**Relative advantage:** Clear advantage in effectiveness or cost-effectiveness over past policy. **Compatibility:** Policy is compatible with adopters' values, norms and perceived needs, and ways of working. **Complexity:** Innovation is simple to use, able to be broken down and adopted incrementally. **Trialability:** Intended user can experiment with innovation on a limited basis. **Observability:** Benefits of innovation are visible to intended adopters. **Reinvention:** Adopters can adapt, refine, and modify policy to suit their own needs or local context. **Fuzzy boundaries:** The 'soft periphery' or flexibility of an organization may facilitate adoption of an innovation. **Risk:** A high degree of innovation uncertainty discourages adoption. **Task issues:** alignment of innovation with performance of intended user's work facilitates adoption. **Knowledge to use it:** Adoption is more likely if the knowledge required to use it can be transferred from an existing knowledge base. **Augmentation/Support:** innovations with built in support and training are more likely to be adopted.
Adoption by individuals The characteristics of the policy actor who seeks out and interacts with the innovation.	**General psychological antecedents:** Individuals that have traits associated with a propensity to try new things facilitate adoption. **Context-specific psychological antecedents:** Intended users that are motivated and able to use an innovation are more likely to adopt it. **Meaning:** Alignment of innovation meaning with intended adopters' framing facilitates adoption. **Adoption decision:** Decisions to select and use an innovation are dependent on other decisions. **Concerns in pre-adoption stage:** Intended adopters have sufficient information on adoption. **Concerns during early use:** Adoption more likely if intended adopters have continued access to information and training. **Concerns in established users:** Successful adoption more likely if adequate feedback is provided to intended adopters.
Assimilation by the system The complex process of innovation integration into the system. Overlaps with the concepts of system readiness and implementation.	**Assimilation:** the complex process of incorporating an adopted innovation into an organization.

Model component	Attributes
Communication and influence* The various factors that help spread the innovation; ranging from unplanned, informal sharing, to active and organized dissemination.	**Network structure:** Adoption is influenced by the structure and quality of social networks. **Homophily:** Adoption is more likely if potential adopters are similar to each other in terms of socioeconomic, cultural, and professional backgrounds. **Opinion leaders:** People with additional influence over their peers and colleagues. **Harnessing the opinion leader's influence:** It can be challenging to recruit opinion leaders to influence adoption. **Champions:** Individuals who are willing to support an innovation and encourage support from others. **Boundary spanners:** Individuals who are able to link an innovation between different groups and organizations. **Formal dissemination programs:** Planned distribution and promotion of an innovation.
System antecedents for innovation Different jurisdictional and organizational contexts, including structural and cultural, that influence policy adoption.	**Structural determinants of innovation:** Organizations are more likely to adopt if they are large, mature, functionally differentiated, specialized, and have slack resources. **Absorptive capacity for new change:** Organizations that are able to identify, interpret, and reframe new knowledge are better able to adopt and assimilate innovations. **Receptive context for change:** The collective factors that facilitate an organizations ability to embrace new ideas, such as strong leadership, clear strategic vision, and a climate that fosters experimentation.
System readiness for innovation Describes the internal factors related to how ready a jurisdiction is to adopt a policy. A jurisdiction may be amenable to an innovation, but may not be ready to adopt it.	**Tension for change:** If current situation is intolerable, innovations are more likely to be adopted. **Innovation-system fit:** Adoption is more likely if it aligns with an organization`s values, norms, strategies, and ways of working. **Assessment of implications:** Adoption is more likely if the implications and effects of the innovation are assessed and anticipated. **Support and advocacy:** Adoption is more likely if supporters outnumber opponents. **Dedicated time and resources:** Adoption and assimilation is more likely if there is a budget and long-term resourcing. **Capacity to evaluate the innovation:** Innovations are more likely to be assimilated and sustained if evaluation systems are in place.
Outer context: inter-organizational networks and collaboration External factors that influence a jurisdiction's decision to adopt an innovation and its efforts to implement and sustain it.	**Inter-organizational norm-setting and networks:** Organizations are more likely to adopt if similar organizations have already adopted. **Intentional spread strategies:** Formal networking initiatives may facilitate adoption. **Wider environment:** The impacts of the innovation on the wider environment may influence adoption. **Political directives:** Adoption may be facilitated by a policy push and external mandates facilitate adoption.

Model component	Attributes
Implementation and routinization Influences on the early usage of the innovation. Overlap with factors influencing decision-making, organizational development, and assimilation.	**Organizational structure:** Adaptive and flexible organizational structures facilitate adoption. **Leadership and management:** Top management support and advocacy of the innovation facilitate adoption and success of implementation. **Human resource issues:** Implementation and routinization depends on the motivation, capacity, and competence of human resources. **Funding:** Innovation implementation is more likely to be successful if there is dedicated and ongoing funding. **Intra-organizational communication:** Effective communication across departments and organizations facilitates implementation. **Inter-organizational networks:** Complex implementation requires coordination across the inter-organizational network. **Feedback:** Implementation and routinization is influenced by accurate and timely access to information about innovation impact. **Adaptation/ Reinvention:** Innovations adapted to the local context are more likely to be successfully implemented.
Linkage among components of the model The connections between components of the policy diffusion model.	**Linkage at the development stage:** Innovations are more likely to be successful if developers and users are connected during development. **Role of the change agency:** Change agents may facilitate adoption and successful implementation if they are connected with intended adopters. **External change agents:** External change agents may be more successful if they are similar to potential adopters, trained and knowledgeable, and effective communicators.

***** The component *diffusion and dissemination* was renamed *communication and influence*

Sample and Data Collection

Between November 2015 and January 2016, we conducted semi-structured telephone interviews with fifteen policy-influencers from each of the five study provinces: British Columbia (n = 4); Alberta (n = 5); Saskatchewan (n = 2); Manitoba (n = 1); and Ontario (n = 3). Eleven interviews were individual and two were group interviews (two participants each), with group interviews arranged upon participant request. Participants were identified through government and physical activity organization websites and through snowball sampling from DPA policy experts. Only those policy-influencers that self-identified as having knowledge and experience with DPA policy in their province were invited to participate in an interview. Included participants represented past and current employees from provincial government (Ministry of Education or Ministry of Health; n = 8), and provincial organizations supporting physical activity in schools (n = 7). All participants provided informed verbal consent. Research ethics approval was granted by the University of Alberta Research Ethics Board (Pro00049723, 26 June 2015).

Interview questions focused on DPA policy adoption and diffusion. For example, participants were asked to describe: if they were aware of other provincial DPA policies; if they were influenced by others when developing their policy; if they knew of the policy working well in other jurisdictions; and if their organization/government shared any information around DPA policies with other jurisdictions. Interviews were scheduled for one-hour and were on average 52 minutes long. All interviews were digitally recorded and transcribed verbatim. Identifiable information was removed from the transcripts, file names were coded, and files were password-protected to protect participant anonymity.

Data Analysis

To investigate the role of policy diffusion in the adoption and spread of DPA policies across Canada, the policy diffusion conceptual model outlined by Greenhalgh and colleagues [10] was used to explore alignment between key informant interview data and components of the analytical framework. Directed content analysis [17] was useful to further explore and apply policy diffusion theory to understand if and how policy diffusion influenced DPA adoption in provinces across Canada. Greenhalgh et al.'s framework [10] was chosen because the model components were representative of a synthesis of theoretical and empirical findings, based on a

systematic review of policy diffusion literature. The model components were therefore appropriate to guide data analysis and capture the breadth of policy diffusion concepts.

Using directed content analysis [17], we created an initial coding scheme informed by the attributes outlined in Greenhalgh et al.'s policy diffusion conceptual framework [10] (Table 5.1). Each transcript was coded using Nvivo qualitative analysis software (QRS International, Version 11 for Windows). We first read through the entire transcript to become familiar with the text. Next, transcripts were coded using the *a priori* codes based on Greenhalgh et al.'s attributes [10] to assign meaning to pieces of text within the transcript. Within each provincial case, attributes were organized into the relevant model components. Internal and external homogeneity [18] were considered during the grouping process to ensure that ideas within each attribute and model component aligned within groupings (internal) and between groupings (external). This process revealed overlap between attributes and model components and we decided to group similar model components together in some instances. A second member of the research team reviewed the analysis process and findings to assess accuracy and coherence of data.

To determine if and how diffusion occurred, policy-influencer interview findings were then compared to theoretical patterns and mechanisms of diffusion [8, 11, 12, 19]. Five mechanisms of policy diffusion were considered in the study: learning; imitation; competition; normative pressure; and coercion [12, 19]. Learning describes the process by which governments gain information about policy success and effectiveness from other governments. Imitation involves copying a policy in order to look like another government, with the focus on emulating the adopter rather than the policy. The imitating adopters perceive the original adopters to be worthy of emulation, regardless of policy effectiveness. Competition, namely economic competition, involves potential adopters being more likely to adopt a new policy if there are economic benefits, particularly if they can get an advantage over their peers. Normative pressure describes when governments adopt a policy because they observe other governments with shared norms adopting the policy first. Coercion describes when a larger, more powerful government incentivizes or forces another government to adopt a policy. Coercion may occur horizontally across similar levels of government, or vertically down from federal government to provincial.

Alternatively to policy diffusion, patterns of policy adoption may be explained by spurious diffusion [20]. There are a number of alternative hypotheses and explanations [11, 20, 21] that describe the mechanisms influencing policy adoption, irrespective of what peer or neighbouring governments are doing. In this study, we explored three alternative explanations for policy adoption: an external common shock, independent internal factors, and chance [11, 20, 21]. Government responses to an external event, or 'common shock', may explain why multiple governments adopt similar policies in a similar timeframe. For example, the release of a health report with compelling data may independently influence a number of governments to adopt a new health promotion policy. Independent factors internal to the potential adopter may also explain policy adoption if governments decide to adopt a policy irrespective of what their peers are doing. Finally, observed patterns of policy adoption may be the result of chance or coincidence.

Rigour [18, 22] was ensured in the study by maintaining an audit trail, consulting with experts and co-authors, and using an analytic framework to guide analysis. We kept an audit trail to record decision-making processes throughout data collection and analysis. All of the study authors contributed to identifying and mitigating researcher bias during interview question development and data analysis. For example, questions were phrased to avoid leading participants in a certain direction, and researchers took time for reflexivity during data analysis. As well, we used an established policy diffusion model to guide analysis to ensure credibility of the research findings by determining areas of divergence and convergence with current literature. Finally, directed content analysis with an a priori codebook helped to ensure consistency with data analysis between participants and across cases.

Results

Of the nine components of Greenhalgh et al.'s policy diffusion model [10], seven components aligned with the findings from the present study. Due to the overlapping of concepts in the model, four components were collapsed into two groups to avoid repetition of ideas. The seven model components, in their revised five groups, that aligned with the study findings are as follows: 1) *attributes of the innovation*; 2) *system antecedents for innovation* and *implementation and routinization*; 3) *system readiness for innovation* and *assimilation by the system*; 4) *outer context: inter-organizational networks and collaboration*; and 5) *communication and influence*.

The remaining two model components were not raised by participants as major ideas. Within the included model components, fifteen attributes closely aligned with participant responses. The attributes are: i) *relative advantage*; ii) *compatibility*; iii) *complexity*; iv) *reinvention*; v) *observability*; vi) *absorptive capacity for new knowledge*; vii) *receptive context for change*; viii) *structure*; ix) *innovation-system fit*; x) *dedicated time and resources*; xi) *capacity to evaluate the innovation*; xii) *political directives*; xiii) *inter-organization norm-setting and networks*; xiv) *network structure*; and xv) *boundary spanners*. Definitions of these attributes are presented in Table 5.1 (above), and their alignment with participant responses is presented in the following sections. The fifteen attributes aligned with most, but not necessarily all, provincial cases. Illustrative quotes for each case demonstrate where findings either aligned with or diverged from Greenhalgh et al.'s policy diffusion model attributes [10]. A summary of the policy diffusion model components, attributes, and illustrative quotes are presented in Appendix G.

1) Attributes of the innovation

Participants' description of the attributes of the DPA policy innovation comprised the policy diffusion model attributes *relative advantage, compatibility, complexity, reinvention,* and *observability*. In terms of *relative advantage*, some participants described evidence of DPA policy effectiveness, though others suggested that DPA was not advantageous over a well-established physical education program. For example, in Manitoba "it was overall a fairly positive implementation and we've had some indication of [increased] physical activity levels over time" (MB). Conversely in Saskatchewan, one participant stated: "I firmly believe that if the provincial government is going to mandate 150 minutes of physical education a week, and that we firmly believe in quality daily physical education… we would not need to have this [D]PA policy" (SK).

Across cases, participants agreed that DPA was *compatible* with provincial values and norms: "We struggle with the healthcare costs and… and I think that the government saw this as our way of preventing and reducing the number of chronic diseases that will be seen from our children" (BC). However, participants agreed that the DPA policies were often a compromise between what was needed for students and what was feasible in the school system, such as in Alberta: "it was really based on a combination of what was palatable and what we really knew from the science" (AB).

When describing attributes related to the *complexity* of DPA, there were differing perspectives on how simple the policy was to use. Some participants in Ontario described the policy as easy to understand, though participants from other provinces (British Columbia and Alberta) suggested that the policy was confusing for educators to understand. For example, in Ontario DPA was described as "not really an extensive policy…it's really a statement…it's DPA, it's 20 minutes, it's continuous, it's sustained, it's grades one through eight" (ON). Conversely, in Alberta "there was huge confusion as to what was DPA. Huge" (AB).

The attribute *reinvention* was raised briefly by participants from three cases (BC, MB, ON). In British Columbia the DPA policy was first adopted in 2008 then revised in 2011 to better meet the needs of educators and students by increasing the flexibility of the delivery model. Reinvention demonstrates that the province was able to modify the policy to better suit their needs. Conversely, participants from other cases explicitly stated that the policy was 'closed' and had not been changed since policy adoption. For example, a participant from Ontario said: "This policy has…been closed for ten years…It hasn't been altered, modified, updated, you know, anything" (ON).

The final attribute considered within the model component attributes of the innovation was *observability*. The attribute was described in the context of the visibility of the policy document. A lack of document visibility was described as a challenge in Saskatchewan because "the [policy] document has some real value in it, but I would suggest that many people who weren't in the direct line of seeing it and looking at it when it first came out, aren't really paying much attention to it" (SK). Alternatively, another participant from Ontario described the observability of other provincial DPA policies, suggesting that others are also struggling with implementation: "The sense I get from other provinces is…we're running into the same issues across Canada, with respect to other provinces having difficulty implementing [DPA]" (ON).

2) System antecedents for innovation* and *Implementation and routinization

The characteristics and contexts that influenced DPA adoption in each case aligned with the elements with the two model components *system antecedents for innovation* and *implementation and routinization*. All cases showed evidence of an *absorptive capacity for new knowledge* demonstrated through participants' descriptions of provincial studies and reports that were conducted or consulted leading up to policy adoption. For example, in British Columbia "in

2005 the province started Act Now BC, which was a cross government initiative which had some key focus areas: physical activity, healthy eating, tobacco, and [alcohol use during pregnancy]" (BC). As well, a participant from Saskatchewan shared that "there was a study conducted… to try to find out how provincial curriculum was being actualized in the province, with a part of that survey being about physical activity" (SK).

Most participants (representing British Columbia, Alberta, Saskatchewan, and Manitoba) noted that their province was *receptive to change*. For example, Saskatchewan was described as being "incredibly collaborative… People are genuinely really supportive of what's going on at the school" (SK). Furthermore, in some provinces, efforts to adopt DPA policy came directly from the provincial government, such as in Manitoba: "There were signs that things were happening at the government level to explore maybe some policy changes or new directions in terms of the curriculum and the mandating of phys ed" (MB).

The attribute s*tructure*, including the provincial government's size, resources, and internal organization, was implicated in all cases. Participants described governments' efforts to hire additional staff (BC, AB, and MB), partner with relevant ministries across government (BC and SK), and establish working groups to support DPA (ON). For example, a participant stated that "We had a shared position that was Healthy Schools BC Coordinator, so they provided the educational expertise when they were at the [Ministry of] Education, and then as well as the health expertise from [the Ministry of Health]" (BC). As well, in Saskatchewan, the DPA policy document was created at the Ministry of Education "but the document was written in partnership with the Ministries of Health and Tourism at that time, Parks Culture and Sport" (SK).

3) System readiness for innovation* and *Assimilation by the system

The attribute *innovation-system fit* describes the alignment between adopter ideology and their goals, skills mix, and ways of working. For example, one participant described how establishing a DPA policy was an opportunity to be seen as a 'trailblazer' by leading an initiative to promote physical activity in schools. In Manitoba, DPA was seen as a strategy to address both the issues of physical inactivity and obesity in students: "[There] were concerns about obesity levels and inactivity. And so the thought was that if we can make physical education mandatory with a policy that required a certain amount of hours of moderate to vigorous physical activity in it, then you can kind of get at both" (MB).

In terms of *dedicated time and resources*, three provinces (Alberta, Manitoba, and Ontario) allocated funding to support DPA implementation. In Ontario "the government made a decision to invest, I think it was upwards of ten million dollars into the implementation of DPA" (ON). However, Manitoba was unique in that the funding was permanent: "The Department [of Education] increased funding to the system…and it's a continued funding, it's still in place now" (MB). In addition to funding, most provinces (British Columbia, Alberta, Manitoba, and Ontario) provided additional training and resource books to educators. However, the provision of additional funding and educator training were not mentioned by participants from Saskatchewan, which was the only province with voluntary DPA guidelines.

When describing provincial *capacity to evaluate the innovation*, there were differing views on the role government should play in policy evaluation. Participants from British Columbia, Saskatchewan, and Manitoba outlined examples of studies and evaluations that had been conducted, such as: "The Youth Health Survey surveyed students on self-reported physical activity for two surveys in '08, and in 2012, and '08 was the implementation year of the phys ed policy" (MB). Conversely, participants from Alberta and Ontario explained that provincial government did not tend to monitor or evaluate policy implementation: "No, but that is true for any element of the curriculum. We don't monitor or evaluate how [teachers] are doing geography or world issues, or math or anything like that…Monitoring and implementation is the responsibility of the [school] boards" (ON). Participants indicated that while academic scores were assessed with provincial achievement tests, DPA and other healthy school policies were not evaluated by provincial government. Instead, external organizations and researchers evaluated DPA implementation and impact in each province, at their own discretion. For instance, in Alberta, "Government doesn't tend to do [evaluation]. When they did, for example, the nutrition policy, it was outsiders who went to measure what the implementation of that was. It was never the Ministry of Health that really did a full assessment as to what was happening there" (AB).

4) Outer context: inter-organizational networks and collaboration

Political directives, including influences from political leaders, was a common attribute across all cases. Windows of policy opportunity that were opened during provincial elections may have influenced DPA adoption. A participant from Saskatchewan suggested that DPA was raised during election time as a strategy to gain political support and voters: "It was in an

election time and all of a sudden [DPA] was just there… I think it was political – trying to gain political support" (SK). On the other hand, in Manitoba, DPA adoption may have been facilitated when the governing party changed from a party that was less receptive to physical activity initiatives to one that supported school-based physical activity: "It had a lot to do with the governing party…so when the new government came in, I think there was quite a lot of support for promoting active healthy lifestyles in schools" (MB).

The attribute *inter-organization norm-setting and networks* relates to whether other similar provinces have adopted or plan to adopt the innovation. Participants provided examples of this attribute when they described their awareness of other DPA adopters in Canada. For example in British Columbia, the provincial government "had looked at…other provinces who had implemented or initiated [daily] physical activity" (BC). In Ontario, one participant explained that the government typically looks to their 'neighbours in Canada' to learn from peers when developing policy.

5) Communication and influence

The model component *communication and influence* was raise by participants with respect to the attributes *network structure* and *boundary spanners*. *Network structure* comprised both formalized networks through external organizations, and informal networks of individuals working in the same field. The role of the Joint Consortium for School Health was raised by participants in British Columbia and Ontario as a key 'vehicle' for conversation and sharing between provinces and territories across Canada. The Consortium is a pan-Canadian network of representatives from provincial and territorial Ministries of Health and Education that meets to discuss comprehensive school health, including physical activity promotion. Similarly, on the informal level, one participant from Alberta described the strong social and professional network between the few physical education specialists across Canada: "Our network was very strong across Canada because the phys ed world's pretty small…We had a great social network as well as a professional network" (AB).

Similarly, the attribute *boundary spanners*, which covered participants' descriptions of informal sharing and learning of policy ideas outside of their ministries and across provinces, was raised by participants from all cases. Participants from both Ontario and British Columbia noted that informal sharing and learning between provinces did help inform provincial policy

development. For example, a participant from British Columbia claimed "there was no sort of intentional working together to kind of create a policy. More so sharing information on what are you guys doing, or what have you done already and kind of using that to help inform [policy development]" (BC). Participants from Saskatchewan and Manitoba directly stated that they had looked at the DPA policies in the other provinces. One participant from Saskatchewan went so far as to say that the Alberta DPA policy had a 'huge influence' on the development of their DPA policy document. Participants in Alberta described examples of dissemination activities through conference presentations in British Columbia and policy document sharing with Ontario. For example, one participant shared their experience with policy sharing with other provinces by saying: "I certainly went and presented at some conferences in those other provinces, either invited or just applied" (AB).

Did diffusion occur?

To determine if and how diffusion occurred, policy-influencer interview findings were then compared to theoretical patterns and mechanisms of diffusion [8, 11, 12], including learning, imitation, competition, normative pressure, and coercion. Beyond policy diffusion, alternative hypotheses and explanations [11, 20, 21], including an external common shock, independent internal factors, or chance, were also explored. The following sections are presented as a debate, outlining evidence for and against policy diffusion (Figure 5.1), followed by a discussion of our verdict on whether policy diffusion occurred.

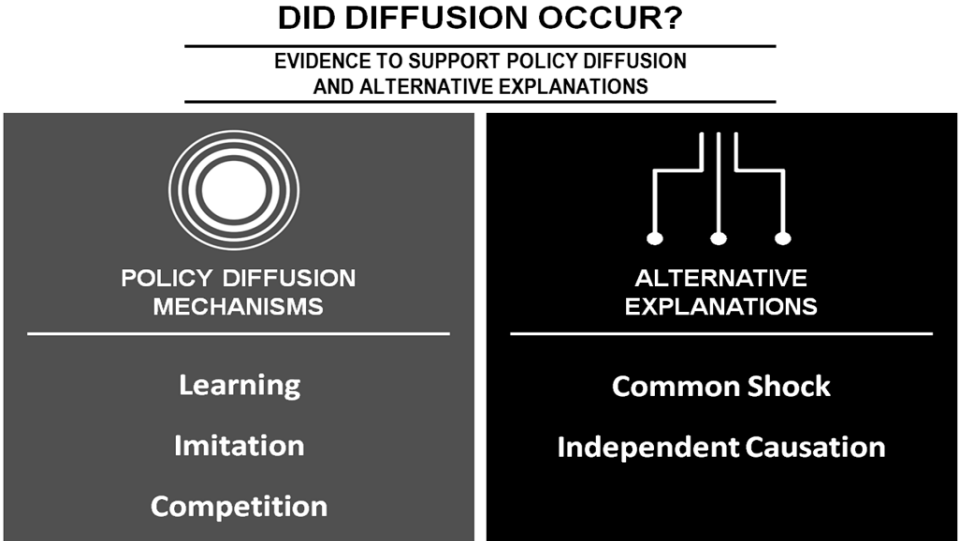

Figure 5.1 Summary of evidence to support policy diffusion and alternative explanations

FOR policy diffusion

Five mechanisms of policy diffusion were considered in the study: learning; imitation; normative pressure; competition; and coercion [12, 19]. Based on participant responses, we found that learning, imitation, and competition were applicable to provincial DPA policy diffusion in Canada.

LEARNING: Learning was the dominant mechanism influencing the adoption and spread of DPA policies. In this study, participants provided examples of learning about successful policy *adoption*, but not necessarily learning about the longer-term impacts of DPA policy on students' health. Provincial governments learned from their neighboring provinces in Canada. For example in Saskatchewan one participant described that they were in consultation with the geographically 'closer' provinces during DPA policy and physical education curriculum development. In Ontario, one participant suggested that the province regularly looks to its peers when developing policy: "Whenever we develop a policy it's one of the first things that we do is a jurisdictional scan and particularly looking at our neighbours in Canada and seeing what they're doing…what successes, lessons learned…that we can use to leap off" (ON). Similarly, provinces were able to share ideas and discuss DPA through the Joint Consortium for School Health, a pan-Canadian network connecting representatives from provincial ministries of education and health. According to a participant from British Columbia, "the key vehicle for conversation between the jurisdictions around healthy living topics is the Joint Consortium for School Health… I would say that's the key place where those jurisdictional conversations are going on" (BC).

IMITATION: Imitation played less of a role in DPA policy diffusion, and was only alluded to by one participant from British Columbia. The participant described how the provincial government looked to and was influenced by two large provinces in Canada: "We had looked at... a couple of other provinces who had implemented or initiated [daily] physical activity. And I believe that Ontario was one and I think that Alberta was the other…The two other 'bigs', Ontario and Alberta" (BC). Similarly, in a study of municipal anti-smoking policy, researchers Shipan and Volden [12] found that jurisdictions are more likely to adopt a new policy when large, neighboring jurisdictions are first to adopt the same policy.

COMPETITION: Competition was a key mechanism involved in the diffusion of DPA policies, but not in terms of financial competition. Instead, we suggest that competition took the form of a challenge between provinces to be seen as a leader in child physical activity and health promotion. For example, a participant from Alberta suggested that the Canadian Ministers of Education Conference provided an opportunity for Ministers of Education to share policy innovation ideas, and shared what their province was doing to support health in schools. As a participant stated: "the main story that was going around is that [DPA] came about at a... Canadian Ministers of Education Conference, where people were kind of saying 'well we're doing this in our province', 'we're doing this' and then... our Minister of Education said 'well we're doing daily physical activity'. And that's really how it came about" (AB).

Normative pressure and coercion did not emerge as dominant mechanisms of diffusion. It is expected that normative pressure may play a larger role later in the diffusion process as, or if, more jurisdictions adopt DPA policies. Diffusion can occur over multiple decades [13], and though DPA policies were first adopted over ten years ago at the time of this study, the remaining eight provinces and territories in Canada may be influenced by their provincial peers to adopt the policy. As well, coercion forces were not present in the study. The finding aligns with the typical conduct of provincial governments to not laterally pressure neighbouring provinces to adopt a policy, particularly if there is no direct benefit or disadvantage to doing so. Furthermore, participants did not describe any national pressures to adopt policy.

AGAINST policy diffusion

There is also evidence to suggest that alternative explanations may instead describe the patterns in DPA policy adoption across Canada. Two such alternative explanations are a common shock from an external event, and independent causation resulting in distinct trajectories to policy adoption within each case [11].

COMMON SHOCK: An external event, or 'common shock', may provide an alternative explanation as to why several provinces adopted similar DPA policies within a relatively short time span. Childhood physical inactivity and obesity were growing issues in Canada and internationally leading up to DPA policy adoption [23-25]. Governments may have taken steps within their provinces to address these rising issues, irrespective of what their peers and neighbours were doing. For example, participants from British Columbia, Alberta, and Ontario

mentioned that they were aware of the rising rates of childhood obesity and physical inactivity through external documents such as the Active Healthy Kids Canada Report Card [26], Canadian Society for Exercise Physiology physical activity guidelines [27], and reports from the World Health Organization [28, 29]. In Alberta, the DPA policy was described as "a reaction to statistics around… our children being overweight or obese… that's really when the [DPA] initiative… was born, out of that type of literature" (AB). Unique to British Columbia, participants indicated being influenced by the 2010 Vancouver Olympic bid to put additional resources and attention into promoting physical activity and sport in the province. As one participant suggested: "there was a goal put in place to make British Columbia the most active province, for children leading up to that event. And so part of the conversation was thinking of policy strategies that could be put in place to support meeting that goal for the Olympics" (BC).

INDEPENDENT CAUSATION: Across provinces, there was evidence of distinct policy trajectories leading up to policy adoption, suggesting the close timing of DPA policy adoption across provinces may have been coincidental. For example, in the province of British Columbia, the DPA policy may have been adopted during the development and momentum generated by the 2005 Act Now BC provincial health promotion strategy, and the concurrent anticipation of hosting the 2010 Winter Olympic Games. Similarly, 2005 marked the release of the Healthy Kids, Healthy Futures Task Force Report in Manitoba, which included 47 recommendations to promote healthy living [30]. One participant from Manitoba suggested that the report was "a fairly significant step in making phys ed mandatory" (MB). Our previous document analysis of DPA adoption and diffusion outlined many other key events that preceded adoption in each of the five adopter provinces that support the notion of independent policy trajectories [14]. Similarly, timelines leading up to policy adoption were outlined by researchers studying DPA adoption, implementation, and impact in Alberta [31] and Ontario [32]. It is difficult to determine if these distinct policy trajectories are indicative of independent adoption of similar DPA policies, or if DPA policies diffused and were more readily adopted because they aligned with existing provincial priorities related to promoting increased participation in physical activity amongst children.

Furthermore, the differences between the DPA policies may support the idea that not one DPA policy spread across provinces, but that provinces adopted similar policies instead, again possibly in response to a common shock or due to independent policy trajectories. There are

noted differences between the DPA policies in terms of grades affected, duration and type of activity, the delivery of DPA, and the strength of the policy [14]. These differences among policies could be interpreted as evidence that DPA policies did not diffuse, or may indicate that the idea of DPA policies diffused, but the content of the particular policies did not [14].

The VERDICT

We propose that DPA adoption was largely influenced by policy diffusion. However, independent provincial responses to a prevalent issue facing society may have also facilitated decisions to adopt. The finding is supported by authors Berry and Berry [19], who state: "Certainly, once a policy is adopted by one jurisdiction, it is extremely unlikely that another jurisdiction's adoption would be completely independent from the previous one. Unless the two governments arrived at the same (or very similar) policy via a highly improbable coincidence, at a minimum there must have been diffusion from one government to the other of the idea for the policy" (p. 319).

Discussion

The purpose of this multiple case study was to investigate the role of policy diffusion in the adoption and spread of DPA policies across Canada. Directed content analysis of policy-influencer interviews revealed that participants responses aligned with fifteen attributes within seven of Greenhalgh et al.'s [10] nine policy diffusion model components. The remaining attributes and model components were not raised by participants and were out of the scope of the study (either too specific on the individual, or concerned with abstract connections across components). Findings revealed evidence to support the theoretical elements of the policy diffusion model, as well as evidence that did not support it. The use of an analytic framework was valuable in order to explore the breadth of policy diffusion, and to assess alignment of DPA policy adoption and spread with elements of policy diffusion theory. A challenge with using this model was that elements within Greenhalgh et al.'s model were not mutually exclusive of each other. To address this, we grouped similar components together resulting in five groups comprising the seven model components. This complicated the analysis process as the *a priori* codebook needed to be adapted to account for the overlapping of components. Regardless, key study findings aligned with a majority of the framework's model components.

Based on findings from a review of documents pertaining to adoption of DPA policies [14], we previously suggested that although the concept of DPA policies appeared to have diffused among some Canadian provinces, it was not clear to what extent the content of these policies diffused. The present study, with its focus on policy-influencer perspectives, provides additional insight into factors that influenced DPA adoption and spread. Based on participant responses, we offer that *learning* was the dominant mechanism driving policy diffusion. *Imitation* and *competition to be seen as a leader* were secondary mechanisms influencing the diffusion of DPA policies across provinces. However, it is important to recognize that the present study may only provide insight into the current state and historical aspects of provincial DPA policy adoption in Canada. Future policy diffusion, and the mechanisms that influence policy adoption, may change over time.

Strengths and Limitations

A multiple case study was an appropriate design to explore DPA policy from different cases across Canada. Key informant interviews were a suitable data collection strategy to explore policy-influencer perspectives on DPA, expanding on our previous work with a document review [14]. Using directed content analysis also proved to be a useful approach to begin to understand policy diffusion. Furthermore, the use of Greenhalgh et al.'s framework provided a range of policy diffusion areas to consider and ensured that key diffusion elements were included in the analysis.

The study was limited by only including positive cases in the multiple case study, meaning only current DPA policy adopters were studied. When studying diffusion, it may also be important to include non-adopters as these groups may have influenced the spread of DPA policy ideas across Canada. For example, non-adopters may have been unsuccessful at adopting a policy, but still contributed to diffusing the idea to other governments. Similarly, because the study was conducted at a time point within the diffusion process, non-adopters may decide to adopt DPA policies in the coming years. Additionally, some jurisdictions may have learned about DPA policies but intentionally chose not to adopt. Each type of non-adopters may provide additional insight into our understanding of the DPA policy diffusion, particularly why some jurisdictions choose to adopt policies, while others do not.

Due to the limited scope of the study on adopters, this study was limited by a small pool of potential participants. Combined with recruitment challenges, we had few policy-influencers take part in the study. For example, in one case, we only had one policy-influencer participate. Despite the small sample, the included participants were DPA policy experts in their province and were able to provide rich descriptions of policy adoption and diffusion.

Conclusion

This study contributes to an increased understanding of policy diffusion, and the role it played in the adoption and spread of DPA policies across Canada. Directed content analysis of policy-influencer interviews revealed that participant responses aligned with fifteen attributes within seven of Greenhalgh et al.'s policy diffusion model components. Findings revealed evidence to support the theoretical elements of the policy diffusion model, and evidence of divergence. The findings provide additional insight into the study of DPA policy in Canada by exploring adoption and spread across multiple provinces, and by showcasing policy-influencer perspectives of provincial government representatives and physical activity promotion organization stakeholders across Canada. Research on policy diffusion can help decision-makers and researchers gain a better understanding of how policies are developed in a larger context outside of the specific jurisdiction it is being implemented in. An exploration of DPA policy diffusion in Canada better informs how and why DPA was adopted, and how these findings can be applied to other physical activity and health promotion policy development. Furthermore, the use of theories and policy frameworks can be applied in research and practice to better understand how and why healthy public policy is developed and spreads across jurisdictions, which is critical for a healthy public policy orientation to promoting population health.

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Chapter 6: Conclusion

Chapter Outline

This research contributes to an increased understanding of the factors influencing the development, adoption, implementation, and diffusion of Canadian provincial DPA policies. In this chapter, I first provide a summary and synthesis of the key findings from Chapters 4 and 5. I then discuss the broader implications of my study with respect to policy and practice. Study limitations are also presented, followed by a discussion on directions for future research.

Overview and Synthesis of Study Findings

In Chapter 4, I explored facilitators and challenges to DPA policy development, adoption, and implementation in provinces across Canada. *Provincial context*, *connection between policy expectations and implementation realities*, *political influence*, and *ideology and policy change* all influenced the development, adoption, and implementation of provincial DPA policies. Across themes, facilitators to DPA policy development and adoption included: past experience with provincial physical activity promotion initiatives and strategies; educator consultation; elected official and bureaucratic support of DPA; use of a provincial election as a policy window; and alignment of DPA with the values of chronic disease prevention and childhood physical activity. A facilitator to implementation was government resource provision (financial and teacher training) to support DPA in schools. Challenges raised by participants focused on policy implementation and included: overlap and redundancy of policy across provincial departments; educator time constraints; lack of accountability and policy evaluation; policy intention perceived to be for political gain rather than for population health; and policy changes may be hindered by moral attachment to a value-laden policy. Though the direction of influence for each theme varied across some cases, each concept is important to consider when studying and developing future DPA and other school health promotion policies.

Study findings also align with the policy literature, for example, non-adopter jurisdictions considering adopting a DPA policy should plan and allocate resources to support policy development and implementation [1] (related to the study theme: *provincial context*), engage various stakeholders and policy actors to get buy-in and policy support [2] (theme: *connection between policy expectations and implementation realities*), adopt a policy during a policy window and with strong political leadership [3] (theme: *political influence*), and include a monitoring and evaluation component [4] (theme: *ideology and policy change*). For current adopters interested in improving their policies, they should work towards better coordination [5] of policies across the jurisdiction to reduce overlap of weaker, short-term policies (theme: *connection between policy expectations and implementation realities*).

As well, researchers [6] suggest that we need to shift our understanding of policy and politics from a top-down, 'thou shalt' approach, to a system that encourages policy engagement from all community members. Well-coordinated citizen involvement in policy development processes has the potential to improve accountability and promote cost-effective policy development [7]. Policy-makers, practitioners, and researchers require a better understanding of the factors influencing policy adoption in order to develop innovative solutions to address childhood physical inactivity and other wicked public health problems in our society.

In Chapter 5, I investigated the role of policy diffusion in the adoption and spread of provincial DPA policies across Canada, including whether, and through what mechanisms, diffusion occurred. The policy diffusion model presented by Greenhalgh et al. [8] was used as the basis for directed content analysis of DPA policy-influencer interview transcripts. Study findings aligned with seven of the nine policy diffusion model components: *attributes of the innovation*; *system antecedents for innovation; implementation and routinization*; *system readiness for innovation; assimilation by the system*; *outer context: inter-organizational networks and collaboration*; and *communication and influence*. The remaining two model components were not raised by participants in the study as major ideas.

Participant responses also revealed that policy diffusion played a role in the spread of DPA policies across Canada, primarily through the mechanism of *learning*. *Imitation* of large provinces and *competition* with others to be seen as a leader also influenced policy spread across jurisdictions. While diffusion played a dominant role in provincial DPA adoption across Canada,

alternative explanations, such as a *common shock* and *independent causation*, may have also contributed to provincial policy adoption.

The benefit of using the policy diffusion model as an analytic framework is that governments often learn from other jurisdictions about what works and what does not before adopting a policy [9, 10]. It is therefore important to understand how some jurisdictions seek out and use information so that policy-influencers and advocates may best target evidence to inform policy adoption. Furthermore, communication networks, such as the Joint Consortium for School Health, may have facilitated DPA policy spread. Future research is needed to better understand how networks and advocacy groups may apply policy diffusion theory to influence policy spread and adoption across jurisdictions.

Taken together, these two studies provide greater insight into the factors influencing development, adoption, implementation, and diffusion of DPA policies across Canada. According to Berry and Berry, 2014, there are two main explanations for policy adoption by a government: *internal determinants* and *diffusion* [11]. These explanations closely align with the findings from Chapter 4 and 5, respectively. For example, internal determinants are described as political, economic, or social characteristics specific to the jurisdiction [11], which align with elements of each of the four themes from Chapter 4. As well, Chapter 5 discussed how policy diffusion is inherently intergovernmental, with governments learning from, imitating, and competing with others during policy development and adoption. Therefore, together the two studies provide a comprehensive overview of factors influencing DPA policy making and diffusion processes in Canada.

An interesting connection between the two studies from Chapters 4 and 5 was that in the early stages of policy diffusion at the time of study, governments did not learn from each other about evidence-based, effective policies. Instead, as found in Chapter 4, policy development and adoption was largely based on policy-influencer ideology and alignment of DPA with the commonly held value of promoting child health. Similarly, participant descriptions of factors related to the mechanism of competition aligned with the finding of political influence contributing to the development, adoption, and implementation of DPA policies. For example, competition to be seen as a provincial leader aligned with participants' perceptions that the DPA policy, in some cases, was adopted largely to make governments and political leaders 'look

good'. Similar to the study findings, policy theory literature [12, 13] suggest that policies are sometimes merely symbolic projections of a government's concern, or that they address a tangible yet insignificant element of a more complex problem. As well, government response to public health issues is often piecemeal and set within short-term timelines [7, 14]. These government actions appear to address current public health issues, but in reality very little may have changed [12].

Findings from both studies also aligned with elements of the scalability model for health promotion interventions in practice [15]. The scalability model outlines six considerations when scaling up health promotion interventions: 1) effectiveness, reach, and adoption; 2) workforce, technical, and organizations resources required; 3) cost considerations; 4) intervention delivery; 5) contextual factors; and 6) appropriate evaluation approaches [15]. From study 1, the scalability considerations 2) through 5) aligned with our findings within the theme *provincial context*, including the availability of staff and financial resources, and the alignment of DPA policy with existing interventions and ideology. From study 2, the *attributes of the innovation* aligned with elements of consideration 1); *dedicated time and resources*, structure, and absorptive *capacity for new* knowledge aligned with consideration 2); and *capacity to evaluate the innovation* aligned with the scalability consideration 6). It is important to note the that authors of the scalability model [15] cautioned that effectiveness tends to decrease as one scales up an intervention. Therefore, it is necessary to address challenges related to scalability and the policy process to ensure intervention efficacy. Solutions to address challenges raised by participants may require improved resourcing, organization, and evaluation of DPA policies. Alternatively, we may need to focus on both large scale DPA policies that reach a large group of people, along with scaled down interventions that promote local-level policy governance through bottom-up community approaches [6]. Better coordination of physical activity policies and interventions [1], and coordination across different agencies (government ministries, organizations) responsible for adoption and implementation [14] may provide a more comprehensive approach to addressing physical inactivity.

The research papers presented in Chapters 4 and 5 provided a complementary overview of provincial DPA policy development, adoption, implementation, and diffusion in five Canadian provinces. Chapter 4 focused on the intra-provincial factors and Chapter 5 examined the inter-provincial factors influencing policy development, adoption, implementation, and spread of DPA

policies. A combination of approaches allowed for a detailed exploration of the policy context in each province to better understand multiple perspectives and the complexities of each DPA policy. More generally, the application of theory and analytic frameworks has important implications in the field of public health to understand how policy may address the wicked, multi-level population health issues [12]. The implications of the findings for policy and practice as described in more detail below.

Implications for Policy and Practice

Research on the factors involved with policy development, adoption, implementation, and diffusion can better inform why and how policy-making is conducted to address complex public health issues [12]. Policy-makers need to enhance their ability to recognize and acknowledge that there are contextual factors, within and between provinces, which influence policy development, adoption, and implementation. A nuanced understanding of factors influencing the policy process may be useful to influence policy change. Based on the research findings, I present five key policy and practice considerations for the development, adoption, implementation, and diffusion of DPA policies.

- Cost-effective policies and the availability of dedicated financial and human resources facilitate development, adoption, and implementation.
- Communication networks within and between provinces and key stakeholders facilitate policy development, adoption, and diffusion.
- DPA policies may be more readily adopted and implemented if they align with existing health promotion strategies and provincial ideology.
- Political will and support from champions within government facilitate adoption.
- An understanding of policy theories, such as policy diffusion, provides greater insight into how and why policies are adopted and spread across jurisdictions.

The availability of dedicated financial and human resources may facilitate the development, adoption, and implementation of DPA policies. Policy development requires investment from government to hire staff, conduct research on best practices, and develop school resources. In the study, participants claimed that having dedicated funding and specialized staff positively influenced DPA policy implementation. This finding is support by evidence that policy-making is dictated by availability of resources, and that limited resources negatively

influence policy actors' ability to properly implement policies [14]. Therefore, DPA policies should be cost-effective and have secure funding available to support long-term implementation. A possible source of funding is to reinvest healthcare savings associated with health promotion interventions into further supporting and developing physical activity policies [1]. Furthermore, by learning from others about what works in a policy, governments may use fewer resources during policy development if they are able to fast-track adoption by imitating an existing policy, through the process of policy diffusion [16].

Communication networks within and between provinces and key stakeholders facilitate idea sharing and influence policy development, adoption, and diffusion. For example, the Joint Consortium for School Health was described by participants as contributing to idea sharing and discussions around DPA policies. Efforts to promote these networks and establish more communication channels across stakeholders and jurisdictions may facilitate adoption or improvements to physical activity policies [1]. As well, during development of the DPA policy in Manitoba, study participants described the importance of including educators and key stakeholders in consultation processes to gain buy-in and support for the policy. Policy-makers should therefore consult key stakeholders to ensure they are engaged at an early stage in an effort to facilitate implementation in schools. Furthermore, researchers [6] believe that policy-making should involve bottom-up, community-based approaches to engage all members of society in the policy-making process.

DPA policies may be more readily adopted and implemented if they align with existing health promotion strategies and provincial ideology. Study findings indicated that DPA policies were easily adopted because they aligned with efforts to promote child health, physical activity, and prevent chronic disease. Existing literature [12, 14, 17, 18] also describes the close connection between policy development and policy-influencer values and how decisions are often made based on political leader or public opinion. Policy-influencers and advocates must therefore consider government and political leader ideology when presenting evidence to political leaders to ensure alignment between solution framing and government/societal values. Furthermore, governments should develop policies that align with other similar physical activity and health promotion strategies to create a coordinated approach to across Canada [1].

Political will and support from champions within government facilitate adoption by putting the issue on the political agenda and in the hands of those with the decision-making power. There is evidence of political will from champions and political parties positively influencing development and adoption of DPA policies in Alberta [3] and Ontario [19]. While champions help increase awareness and put an issue on the political agenda, the effects are often short-lived if policy environments are not supportive of the new policy [14]. To ensure long-term commitment to action from political leaders, health promoters and practitioners need to understand the roles that political leaders can play in policy adoption and must intervene in these processes to advocate for policies that are based on evidence, adequately resourced, and include an evaluation plan [1, 20].

An understanding of policy theories such as policy diffusion provides greater insight into how policies are adopted and spread across jurisdictions [11, 12]. This has implications for policy-makers and health promotion advocates to facilitate idea sharing and adoption of new policies [21]. For example, an understanding of how policies spread across jurisdictions may be used by an advocate to intervene in the policy process and promote adoption of effective policies [20]. Furthermore, relatively simple policies tend to spread and be adopted more readily than more complex or controversial policies [14]. For example, in the study of DPA policies, using Greenhalgh et al.'s policy diffusion framework [8] we learned that the provincial DPA policies were relatively simple to understand with few requirements and that the policies aligned with existing provincial ideology. It is therefore important for practitioners and policy-makers to understand and apply policy theories to policy-making processes in order to better share ideas, advocate for changes, and appropriately frame issues and solutions.

Limitations

The study was limited by a small sample size, resulting from a limited pool of potential participants and challenges with recruitment. As was raised by a study participant, the community of physical activity experts is relatively small in Canada. A small community may have benefits by fostering communication networks and idea sharing, but was challenging to recruit key informants for interviews. To achieve data saturation, I planned to conduct up to two interviews with each participant to ask any necessary follow up questions. The plan changed due to participants' busy schedules and the research project timelines. Despite the change,

participants were able to provide information-rich responses within one interview. Another challenge I experienced was low response to recruitment efforts. For example, I was only able to interview one participant from Manitoba, due to staff members not being available, a vacant position, and two potential participants not responding to requests for information. Other reasons for low recruitment of participants across cases were that potential participants: had recently left their position and/or retired and were not accessible, i.e., personal contact information not available (4 potential participants); declined because not relevant – they had expertise in physical education, quality daily physical education, and/or physical activity more generally, rather than DPA (4); did not respond (4); declined because colleague already participated and believed they would not add anything new (2); and declined to participate in a research project (2).

The study design only included positive cases (i.e., those Canadian provinces or territories with a DPA policy); however, there may have been other jurisdictions that had similar strategies to promote child and youth physical activity other than a DPA policy. With policy diffusion, innovative ideas may spread across jurisdictions and may not result in adoption of the same policy. The implications of this are that the findings may not describe the broader context of physical activity promotion strategies across Canada, and how they may have been influenced by DPA policies. However, the case study still provides a detailed description of DPA policy adopters in Canada.

Another limitation of the study design was related to time. I had to consider and balance participant recall of historical events, the timescale over which policy diffusion may occur, and research project timelines. For example, in some provincial cases (AB and ON), the DPA policies were adopted ten years prior to the study. Participants may have been limited by their ability to recall information related to policy development from that time. On the other hand, policy diffusion often occurs over long time periods, sometimes over twenty years [10]. The present study likely did not capture the full diffusion timeline, and other jurisdictions may adopt DPA policies in the next several years. However, it was not possible in the present study to extend the timeline over multiple years. It may therefore be beneficial to conduct another study on policy diffusion at a later time point when or if more Canadian jurisdictions adopt DPA policies.

Future Research

The present study provided greater insight into the development, adoption, implementation, and diffusion of DPA policies across Canada; however, there is room for future research to expand our understanding of the topic. I propose five areas of future research: 1) explore perspectives of school administrators, educators, and students; 2) study all provinces and territories across Canada; 3) include an assessment of DPA policy impact; 4) explore the role of advocacy groups in facilitating policy development; and 5) expand the application of policy theory, including policy diffusion theory, to the study of physical activity and health promotion policies.

Future research is needed to better understand the perspectives of stakeholders and policy-influencers involved outside of provincial government and physical activity promotion organizations. For example, school administrators, educators, and students may provide valuable information on the details of DPA policies, particularly on policy implementation, as they are directly responsible for providing and participating in DPA. The suggestion to include school administrators, such as superintendents, was raised during participant interviews, but was not feasible to address in the scope of this masters-level thesis research. To gather information from the large sample of school administrators, educators, parents, and students, surveys are an appropriate data collection strategy to sample across jurisdictions. Surveys to assess DPA adoption, implementation, and impact have been previously conducted in some jurisdictions by research groups [22] and advocacy organizations [23]. However, a national or pan-Canadian survey, or aggregation of jurisdictional survey data is needed to better understand the perspectives of this additional group of policy-influencers.

To further expand on the scope of the current study, future research is needed to explore non-adopters of DPA policies. The current study was limited to positive cases (DPA adopters) to set boundaries on the project, but it is important to include negative cases [24] of non-adopters to more fully explore policy diffusion. Non-adopters may include jurisdictions that attempted and were unsuccessful at adopting a DPA policy, those that intentionally chose not to adopt a DPA policy, and those that have yet to adopt a policy. An understanding of non-adopters may provide a better understanding of why some, and not others, choose to adopt DPA policies [10]. Furthermore, as policy diffusion may involves learning about new ideas, an understanding of

non-adopter jurisdictions across Canada may better explain how the idea of DPA policies may have spread across Canada to influence other physical activity initiatives. For example, though the present study focused on DPA policies, in some jurisdictions (SK and MB), DPA was discussed in relation to quality daily physical education initiatives and physical education programs. Other jurisdictions may have been influenced by DPA policies, but instead opted to focus on alternative school-based physical activity initiatives. Therefore, the limited focus on current adopters of DPA and the study of diffusion may have missed some of these other jurisdictions that adopted related, yet distinctly different policies or initiatives.

This study did not assess policy impact; however there is currently limited data available on the impact and efficacy of DPA policies across Canada. For example, Olstad and colleagues [25] used pedometer step count findings from the Canadian Fitness and Lifestyle Research Institute's Canadian Physical Activity Levels Among Youth (CANPLAY) studies to determine child and youth (aged 5-19 years) activity levels before and after adoption of DPA policies. The findings revealed that there was no improvement in step count after adoption of DPA policies. However, the CANPLAY study did not specifically measure DPA as it relates to the policy. Therefore, further research is required to determine the extent of policy implementation and the impacts of the policy on student behaviour and health. Furthermore, researchers [1, 4] are calling for action towards implementing monitoring systems to track physical activity policy implementation and trends in physical activity levels.

In this study, the role of physical activity organizations and advocacy was not raised as a main theme, however further research is needed to understand the potential implications of these groups on influencing development, adoption, implementation, and diffusion of DPA policies. When planning the study, I anticipated that provincial physical activity organizations existed and were active in each province, and were aware of or engaged in promoting DPA policy in schools. This was not the case. British Columbia, Alberta, and Ontario each had a provincial school-based physical activity organization that was active and involved in promoting DPA implementation in schools. Meanwhile, Saskatchewan and Manitoba had provincial physical activity promotion organizations to encourage activity in the general population. Advocacy groups and organizations play an important role in influencing diffusion across governments [26]. Therefore, researchers, practitioners, and policy-makers must better understand the role that advocacy groups and special interest organizations play in DPA policy adoption and spread.

Future research is also needed to further explore how policy theory can be applied to the study of health promotion policies and interventions [12, 20, 21], including DPA policies. Theoretical models serve as important organizing frameworks to increase our understanding of factors influencing physical activity behaviour [27]. In the present study, Greenhalgh et al.'s policy diffusion model [8] was used as an analytic framework to guide interview analysis and organize ideas. However, there are many other policy diffusion theories [11] that can be applied to further study DPA policies to provide a greater understanding of how and why DPA policies were adopted in provinces across Canada.

Furthermore, policy theory may be applied to address other gaps and areas for future research. For example, to further study policy impact, one approach is to apply the REAIM (reach, evaluation, adoption, implementation, and maintenance) theoretical framework [28]. The framework is useful to determine public health impact of policies and interventions [29-31], and has been useful in the study of physical activity interventions [32, 33]. As well, the present study found that physical activity organizations may have played a role in DPA policy development and adoption. To further explore the role of organizations and advocacy groups in the DPA policy process, researchers may apply the advocacy coalition framework [21]. The policy framework may be used to understand how organizations directly or indirectly influence the policy process.

Overall, it is important to study how theories apply to the physical activity and health promotion issues to understand how they fit in a larger, complex system. The application of theory and analytic frameworks has important implications in the field of public health to understand how policy may address the wicked, multi-level population health issues [12]. Application of policy theory to the field of public health is beneficial to understand how policy decisions are made, and policy actors can apply findings to use as leverage points to influence decision-making [20]. Health promotion researchers and practitioners must also being to work towards creating their own field of public health and health promotion politics and political theory [6] to better study and understand the nuanced processes that occur in their field.

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Appendices

Appendix A. Online Sources for Participant Recruitment

Jurisdiction	Government Ministry/ Organization	Website Accessed
British Columbia	Ministry of Education	http://www2.gov.bc.ca/gov/content/home/contact-us
	Ministry of Education – DPA policy	http://www2.gov.bc.ca/gov/content/education-training/administration/legislation-policy/public-schools/daily-physical-activity
	Healthy Families BC	https://www.healthyfamiliesbc.ca/contact
	Action Schools! BC	http://www.actionschoolsbc.ca/
	Directorate of Agencies for School Health (DASH) BC	http://dashbc.ca/talk-to-us/contact/
Alberta	Alberta Education	https://education.alberta.ca/alberta-education/contact-us/
	Government of Alberta – Staff Directory	http://www.alberta.ca/staff-directory.cfm
	Ever Active Schools	http://www.everactive.org/contact
	APPLE Schools	http://www.appleschools.ca/contact
Saskatchewan	Ministry of Education	http://www.education.gov.sk.ca/Contact
	Saskatchewan *in motion*	http://www.saskatchewaninmotion.ca/about-us/contact-us
	Saskatchewan Physical Education Association (SPEA)	http://www.speaonline.ca/contact-us.html
Manitoba	Manitoba Healthy Schools	http://www.gov.mb.ca/healthyschools/contact.html
	Manitoba Education and Training – Physical Education/Health Education	http://www.edu.gov.mb.ca/k12/cur/physhlth/contact.html
	Manitoba Education – Contacts	http://web16.gov.mb.ca/contacts/ContactsController?action=Main
	Manitoba *in motion*	http://www.manitobainmotion.ca/contact/
Ontario	Ontario Ministry of Education	http://www.edu.gov.on.ca/eng/about/contact.html
	Government of Ontario – Employee Directory	http://www.infogo.gov.on.ca/infogo/home.html
	Ministry of Education – Healthy Schools Unit Employees	http://www.infogo.gov.on.ca/infogo/home.html#orgProfile/4322/en
	Ontario Physical and Health Education Association (Ophea)	https://www.ophea.net/contact-us
Canada	Joint Consortium for School Health (JCSH)	http://www.jcsh-cces.ca/index.php/about/contact/school-health-coordinators-committee
	Physical and Health Education (PHE) Canada	http://www.phecanada.ca/about-us/council-provinces-and-territories
	ParticipACTION (formerly: Active Healthy Kids Canada)	https://www.participaction.com/en-ca/about
	Coalition for Active Living (CAL)	http://www.activeliving.ca/english/index.cfm?fa=MembersCorner.Members

Appendix B. Participant Recruitment Email *(Sample)*

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

3-300 Edmonton Clinic Health Academy
11405-87 Ave, Edmonton, AB T6G 1C9

SUBJECT: Provincial Daily Physical Activity in Schools – Invitation to Participate in Policy Discussion

Dear *[potential participant name],*

As someone with experience in daily physical activity (DPA) policy in schools across the province, **you are invited to participate in a guided conversation to discuss the DPA policy adoption and implementation process in *[insert province name].*** Your participation would be part of a study based out of the School of Public Health at the University of Alberta. The purpose of the conversation is to understand the processes underlying adoption and diffusion of Canadian provincial DPA policies.

Your knowledge of and experience with the *[insert province name]* DPA policy will provide us with valuable information to understand the factors involved with successful DPA policy adoption and diffusion.

I have attached an information letter with details on the research project and the roles and expectations of participants.

If you are interested in helping us to understand the DPA policy process in provinces across Canada, please reply to ejcampbe@ualberta.ca to set-up a time for a telephone conversation.

Thank you in advance for your help. Your input is very important to us and we look forward to hearing from you soon.

Regards,

Elizabeth Campbell, MSc(C)
School of Public Health, University of Alberta
3-290 Edmonton Clinic Health Academy
11406-87 Ave, Edmonton, AB T6G 1C9
ejcampbe@ualberta.ca
(780) 267-5994

Candace Nykiforuk, PhD, CE
Associate Professor
CIHR/PHAC/AI-HS Applied Public Health Chair
School of Public Health, University of Alberta
3-291 Edmonton Clinic Health Academy
11405-87 Ave, Edmonton, AB T6G 1C9
candace.nykiforuk@ualberta.ca
(780) 492-4109

ADDITIONAL INFORMATION:

Why are you being contacted?

Your name and contact information was found online and/or through a referral from a colleague of yours. You were identified as someone who has experience with DPA in [insert province name]. **If you believe you are not suitable for this research study,** could you please recommend another colleague that may be able to share their valuable DPA knowledge and experience?

If you have any further questions regarding this study, please do not hesitate to contact: Elizabeth Campbell (Student Research Investigator; ejcampbe@ualberta.ca; (780) 267-5994, or Dr. Candace Nykiforuk (Research Supervisor; candace.nykiforuk@ualberta.ca; (780) 492-4109.

Study Title: Understanding the Daily Physical Activity Policy Diffusion Process in Canadian Provinces

Appendix C. Semi-structured Interview Guide

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

3-300 Edmonton Clinic Health Academy
11405-87 Ave, Edmonton, AB T6G 1C9

SEMI-STRUCTURED INTERVIEW QUESTIONS

Spoken Preamble:

Thank you for taking the time to speak with me today. As someone with experience in provincial daily physical activity (DPA) policy in schools, I would like to have a conversation with you about the DPA policy process in your province. The information I collect from you today will be used as part of my Master's thesis research study in the School of Public Health at the University of Alberta. This research study aims to understand the processes underlying adoption and diffusion of Canadian provincial DPA policies, and to review evidence regarding their implementation and impact.

This guided conversation will take approximately one hour, with prompting questions focusing on the DPA policy process in your province and in provinces across Canada. Your participation in this conversation is entirely voluntary. You may choose to skip certain questions or to end the conversation at any time for any reason. You may choose to withdraw your data within one week of participating in the guided conversation, after which point the data will be analyzed and aggregated with other research findings.

It is important to note that anonymity cannot be guaranteed due to the small number of participants and the risk of identification due to your position in [a provincial government *OR* a DPA implementation organization]. That said, to reduce the risk of a loss of anonymity, conversation transcripts will be de-identified to remove recognizable information about the participant. Identifying information including province and stakeholder sector will be retained as this information is pertinent to how data will be aggregated and analyzed. Aggregated data will be analyzed and emergent themes will be presented in publications and at conferences. As well, transcript quotes that illustrate the overall thematic findings may also be presented.

To avoid a breach in confidentiality, all electronic data will be password protected and stored on password protected computers on the School of Public Health server. File names will be coded so as not to reveal the province or sector. The data collected during this guided conversation may be accessed by members of the research team and by a professional transcriptionist. All personnel that have access to the data will be trained in confidentiality and will be required to sign a confidentiality agreement. As per University of Alberta ethics protocols, all data will be kept in a secure place for a minimum of 5 years following completion of the research project, after which time it will be destroyed.

Consent Questions:
Have you read through the information letter provided to you?
Do you have any questions about the project?
May I now turn on the digital audio recorder to capture the audio from our conversation today?
turn recorder on

I will now go over the consent process. To begin, please state your first and last name, and today's date.

1. Do you understand that you have been asked to participate in a guided conversation as part of a research study?
2. Have you read and received a copy of the attached Information Letter?
3. Do you understand the benefits and risks involved in taking part in this project?
4. Have you had an opportunity to ask questions and discuss the study?
5. Do you understand that you are free to withdraw from the study at any time, without having to give a reason?
6. Do you understand that you will be able to withdraw data collected within one week after the guided conversation is conducted?
7. Has the issue of anonymity and confidentiality been explained to you?
8. Do you understand who will have access to your responses?
9. Are you willing to participate in this guided conversation?
10. With your permission, I would like to audio record this conversation to ensure that I accurately interpret the information that you provide to me. Do you consent to audio recording of this conversation?

Semi-Structured Interview Questions:

1. Please tell me about your background and involvement with [province name's] provincial daily physical activity school policy
2. Please describe the DPA policy adoption process in [province name]. In this case, policy adoption is defined as a decision to make full use of a policy as the best course of action.
3. How did your organization come to believe it was important to adopt DPA policy in your province?
4. Did factors in the wider environment influence adoption and implementation of DPA? If so, what factors? and how?
5. Are you aware of other provinces or jurisdictions that have adopted and implemented DPA policies? If so, which jurisdictions?
6. During DPA policy development, did your organization have knowledge of this type of policy working previously in other jurisdictions?
    a. Did this influence your province's decision to adopt a DPA policy?
    b. Are you aware of other provinces that may have been influenced by your province, or by others in terms of DPA policy development and adoption? E.g. related to knowledge translation, dissemination or reports
7. In the time after your province adopted DPA, are you aware of your province sharing any information on policy adoption to other jurisdictions?
8. Besides DPA, are there other efforts to address the issue of physical inactivity in school-aged children in your province?
9. Has the DPA policy been evaluated in [province name]?
10. Have changes have been made to the original policy? What were those changes? Why were they made?
11. What role do you see the government playing in DPA?
12. Are you aware of any future plans with respect to DPA policy?
    a. What would you like to see happen with DPA policy in your province and across Canada?
13. As you look back on the DPA policy development and adoption processes, are there any other important factors that stand out in your mind?
14. Do you have any further comments or questions?
15. Can you recommend a colleague that may be able to share their knowledge and experience with DPA?
16. Would it be ok if I contact you again to clarify any questions I might have?
17. Would you be interested in participating in future research related to the topic?
18. Would you like to receive a copy of the research findings when they become available?

Concluding Comments:

Thank you for taking time to share your knowledge and expertise with me today. Again, your participation in this guided conversation is entirely voluntary. You may choose to withdraw your data from the research study within one week from today.

In terms of next steps, the conversation transcripts will be analyzed and thematic findings from the qualitative content analysis will be grouped by province and by stakeholder sector (government and organization). Quotes illustrating a theme will be presented in publications, however all participant information will be removed. The findings will be written up in an academic article for publication as part of my Master's thesis project. The study findings may also be published in peer-reviewed academic journals, and presented at conferences.

If you have any further questions about the project please feel free to contact us. The contact information is provided on the information sheet.

Thank you again.

Appendix D. Information Letter and Informed Consent Form

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

3-300 Edmonton Clinic Health Academy
11405-87 Ave, Edmonton, AB T6G 1C9

INFORMATION LETTER

Understanding the Daily Physical Activity Policy Adoption and Diffusion Processes in Provinces across Canada

Research Investigator: Elizabeth Campbell, MSc(C) | ejcampbe@ualberta.ca | (780) 267-5994
Supervisor: Candace Nykiforuk, PhD, CE | candace.nykiforuk@ualberta.ca | (780) 492-4109

Background:

- In Canada, children are becoming increasingly inactive and are at increased risk of poor health outcomes and early development of chronic diseases.
- Healthy public policies, such as school-based daily physical activity (DPA), represent one intervention strategy to address childhood physical inactivity.
- This research aims to assess existing provincial school-based DPA policies and to understand the processes underlying policy adoption and diffusion across Canada.

Purpose:

- Your involvement in the project will include participating in a guided one-on-one conversation to learn from your knowledge and experience with school-based daily physical activity policy in your province.

Study Procedures:

- The guided conversation will take approximately one hour and will occur over the telephone.
- Informed verbal consent will be obtained during the telephone call, prior to commencing the guided conversation questions. You are asked to read through the consent questions in advance, and direct any questions to the research investigator (Elizabeth Campbell).With your permission, the oral consent process will be audio recorded.
- Conversation will be digitally recorded, with your permission. You may ask to have the digital audio recorder turned off at any point without having to give an explanation.
- Audio files will be transcribed verbatim.
- Participants may be contacted by the research investigator (or supervisor) after the conversation to provide additional information and clarification.

Possible Benefits and Risks:

- Study findings will be summarized to help identify contexts in which to implement policy solutions (including amendments to existing, and development of future policies). This information will be shared with decision-makers and will have implications for addressing child physical inactivity.
- There are no anticipated risks with participating in this study.

Participation:

- Your participation in this conversation is voluntary.
- You may choose to withdraw from the study at any point during the guided conversation. If data has been collected, you may choose to have it withdrawn or included in study findings.
- In the event that you choose to withdraw your data, you will have one week after the conversation date to notify the research investigator (Elizabeth Campbell). In this case, your data will be destroyed. This time restriction allows for data withdrawal before the analysis stage.
- If you are uncomfortable with any of the questions, you may choose to not respond.

Confidentiality & Anonymity:

- Due to the small sample of DPA experts in the province, anonymity cannot be guaranteed.
- To reduce the risk of a loss of anonymity, the following steps are being taken:
    - Identifying information about the participant will be removed, including: name of employer and organization, and any names of people mentioned during the conversation.
- Province name and stakeholder sector (categorized as Provincial Government or DPA Organization) will be retained for analysis as this information is pertinent to how data will be aggregated, analyzed, and presented.

Use and Protection of Data:

- Aggregated data will be analyzed and grouped into overarching themes.
- Participant quotes that illustrate the overall thematic findings may be presented, with identifying information about the participant removed.
- Members of the research team will have access to the data. All researchers are required to sign confidentiality agreements and ensure that identifying information will not be shared with members outside of the research team.
- Data will be stored at the School of Public Health, University of Alberta. Digital files will be password protected and be stored on a password protected desktop computer. Hard copies of any research notes will be locked in a secure filing cabinet.
- As per University of Alberta ethics protocols, all data will be kept in a secure place for a minimum of 5 years following completion of the research project, after which time it will be destroyed.

- Research findings may also be submitted for publication in a peer-reviewed academic journal and presented at conferences.
- Interested participants may choose to receive a report of the study findings. Participants will be asked during their guided conversation if they wish to receive a report.

Further Information:

- If you have any further questions regarding this study, please do not hesitate to contact:

Student Research Investigator:
Elizabeth Campbell, MSc(C)
School of Public Health
University of Alberta
ejcampbe@ualberta.ca
(780) 267-5994

Supervisor:
Candace Nykiforuk, PhD, CE
School of Public Health
University of Alberta
candace.nykiforuk@ualberta.ca
(780) 492-4109

- The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

3-300 Edmonton Clinic Health Academy
11405-87 Ave, Edmonton, AB T6G 1C9

INFORMED CONSENT FORM

Understanding the Daily Physical Activity Policy Adoption and Diffusion Processes in Provinces across Canada

Research Investigator: Elizabeth Campbell, MSc(C) | ejcampbe@ualberta.ca | (780) 267-5994
Supervisor: Candace Nykiforuk, PhD, CE | candace.nykiforuk@ualberta.ca | (780) 492-4109

Please read through the following questions ahead of your scheduled interview time. Immediately prior to the interview, with your permission an audio recorder will be turned on and the interviewer will ask you the following questions. Please respond to all questions, and feel free to ask for clarification if a question is unclear to you.

- Do you understand that you have been asked to participate in a guided conversation as part of a research study?
- Have you read and received a copy of the attached Information Letter?
- Do you understand the benefits and risks involved in taking part in this project?
- Have you had an opportunity to ask questions and discuss the study?
- Do you understand that you are free to withdraw from the study at any time, without having to give a reason?
- Do you understand that you will be able to withdraw data collected within **one week** after the guided conversation was conducted?
- Has the issue of confidentiality been explained to you?
- Do you understand who will have access to your responses?
- Do you agree to participate in a guided conversation as part of the project?

Appendix E. Confidentiality Agreement

UNIVERSITY OF ALBERTA

SCHOOL OF PUBLIC HEALTH

3-300 Edmonton Clinic Health Academy
11405-87 Ave, Edmonton, AB T6G 1C9

CONFIDENTIALITY AGREEMENT

Understanding the Daily Physical Activity Policy Adoption and Diffusion Processes in Provinces across Canada

Research Investigator: Elizabeth Campbell, MSc(C) | ejcampbe@ualberta.ca | (780) 267-5994
Supervisor: Candace Nykiforuk, PhD, CE | candace.nykiforuk@ualberta.ca | (780) 492-4109

I, _____ [print name], have been hired to transcribe confidential audio files from telephone interviews as part of a Master of Science thesis research project within the School of Public Health at the University of Alberta.

I agree to:

- keep all the research information shared with me confidential by not discussing or sharing the research information in any form or format (e.g., disks, tapes, transcripts) with anyone other than the Researcher Investigator or the Supervisor.
- keep all research information in any form or format (e.g., disks, tapes, transcripts) secure while it is in my possession.
- return all research information in any form or format (e.g., disks, tapes, transcripts) to the Researcher Investigator or the Supervisor when I have completed the research tasks.
- after consulting with the Researcher Investigator or the Supervisor, erase or destroy all research information in any form or format regarding this research project that is not returnable to the Researcher Investigator or the Supervisor (e.g., information stored on computer hard drive).
- other (specify)_____

_____	_____	_____
(Print Name)	(Signature)	(Date)
_____	_____	_____
(Researcher Print Name)	(Signature)	(Date)
_____	_____	_____
(Supervisor Print Name)	(Signature)	(Date)

Appendix F. Study 1: Findings from the cross-case comparison, with illustrative quotes

Theme	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario
Provincial context	*Previous child health promotion report:* "Our provincial health officer had issued a report...in 2003 called An Ounce of Prevention. And it...helped to kick start sort of a cascade of different initiatives where there was a stronger focus on health in the school setting." *Additional resources; leader:* "[The provincial] government had some additional funding there and wanted to be seen as we are the ones who are changing the province, and our children's futures as we move forward."	*Human resource capacity:* "Alberta Education has a larger membership, has a larger sort of a number or people of working, permanent staff working than other ministries. You know, apart from Ontario I think, but BC and Saskatchewan don't have the same number of people working in the Ministry of Education."	*Province-wide collaboration; small province:* "This province is incredibly collaborative...it's too small a province. Everybody knows everybody, but people are genuinely really supportive of what's going on at the school."	*Previous child health promotion report:* "The Healthy Kids, Healthy Futures Task Force Report...[was] a fairly significant step in making phys ed mandatory." *Physical education specialist human resource capacity:* "In Manitoba we've got a solid base of physical education professionals and a tradition to have specialists teaching phys ed in schools."	*Organization advocacy:* "[Physical activity organization] had put out a statement essentially asking the government to consider the implementation of - at that point we had said a quality daily vigorous physical activity component." *Large province:* "Ontario's a massive province, there's 72 school boards." *Overlap and policy redundancy:* "That's probably one of the biggest issues that we face in the province, is just the overlapping policies or initiatives vs. focusing on deeper implementation of existing policies."
Connection between policy expectations and implementation realities	*Government directive; school responsibility:* "DPA should be strictly at the school and the onus be on the students and the school teachers, administrators to be encouraging and to be enforcing that the students are out and are physically active for at least 30 minutes a day, while they are in the school system." *'Shock'; resource provision:* "Yes it was a bit of a shock to the system, but at the same time we provided the tools to help them be successful." *Implementation status:* "Probably 60-65% of the school and school administrators legitimately implement the DPA policy...but there's still a long way to go."	*Government directive; school responsibility:* "The policy was obviously devised by Alberta Education, or created by Alberta Education, but it's the responsibility of the school jurisdictions and the superintendents within those jurisdictions to ensure that the policy is being mandated." *Implementation status:* "For all intents and purposes in Alberta, although the policy is on the books, if you go into schools, people don't really talk about it much anymore." *Lack of assessment:* "There's no assessment piece, so they'll never be able to truly measure what implementation is like."	*Opposing expectations of educators:* "The expectation from the Ministry [of Education] level is get those language arts scores up... that's all they do is language arts at the expense of everything else." *Incompatible with existing school programs:* "I firmly believe that if the provincial government is going to mandate 150 minutes of physical education a week, and that we firmly believe in quality daily physical education...we would not need to have this [D]PA policy."	*Government directive:* "The policy was adopted by the Department of Education and we had an implementation plan that we followed." *Educator consultation; 'buy-in':* "By doing that [teacher consultation] we also got buy-in right from the start. So it was a pretty smooth implementation." *Maintenance challenges:* "We still have areas of the province where there may be less support and so I think that the continued implementation is a problem too...the continued support...could use a little more attention."	*Mandatory; 'thou shalt':* "This policy is a 'thou shalt' policy. It's part of the curriculum and it's a part of the Education Act, so it is a requirement. It's not voluntary. It's not optional. It is a mandatory requirement." *Lack of accountability:* "There's also no accountability for that policy so it's difficult to know if it's actually being implemented." *Not meeting expectations:* "I think the overall sense here in Ontario is that [DPA has] maybe just not lived up to expectations."

Theme	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario
Political influence	*Minister support; political will:* "Our minister at the time, Minister [of Education name] was quite supportive of [DPA] and definitely was taking kind of a leadership role, in supporting the development and the promotion of that policy...There was definitely a lot of political will around it."	*Minister support:* "Minister [of Education name] had been very clear: he hated phys ed...he wanted it to be fun, he wanted it to be engaging." *Political will:* "DPA could be done and it could make the Minister look good."	*Election commitment; political will:* "It just happened. It was in an election time and all of a sudden [DPA] was just there...we had no idea it was coming." *Political will:* "I think it was political – trying to gain political support."	*Change in government:* "When the new government came in, I think there was a quite a lot of support for promoting active healthy lifestyles in schools."	*Election; Political decision-making:* "People vote in a party that is akin to their values and they let them make these [policy] decisions." *Political will:* "It's a political decision. The political team would have done their research and their consultations...it's similar to many of the policies that we have in that it's part of a guided direction from the government at the time."
Ideology and policy change	*Chronic disease prevention:* "The government saw this [DPA policy] as our way of prevention and reducing the number of chronic diseases that will be seen from our children." *Policy attachment:* "It would be too bad if [DPA] was just taken away…even if it's not perfect." *Change to guidelines:* "[Recommendation] to align with the food and guidelines and calling them more guidelines, the daily physical activity guideline instead of a mandatory policy, gives teachers that flexibility."	*Physical activity promotion:* "There is much better respect in our school system for the need for kids to be active and teachers are working harder to try to promote those quality programs." *Policy was the 'right' idea:* "DPA is an example of when a minister has the right idea and he does something for the good of the people, and the ministry really wasn't ready." *Policy attachment:* "I'd rather have a DPA policy than not."	*Physical activity promotion:* "I never ran across anyone, I'll just speak from the ministry level. I never ran across anyone that disagreed that physical education and physical activity wasn't important." *'Valuable' policy:* "The [DPA policy] document has some real value in it."	*Chronic disease prevention; physical activity promotion:* "There [were] concerns about obesity levels and inactivity. And so the thought was that if we can make physical education mandatory with a policy that required a certain amount of hours of moderate to vigorous physical activity in it, that you can kind of get at both."	*Chronic disease prevention:* "Originally it was chronic disease prevention." *Policy attachment:* "[DPA is] one of our signature policies... it would take a lot of guts to basically say you know this whole DPA thing, yeah we kind of got that wrong."

Appendix G. Study 2: Findings guided by Greenhalgh et al.'s diffusion model, with quotes

Model Component	Attribute	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario
Attributes of the innovation	Relative advantage		"DPA was something that was kind of slapped on and was trying to use different structures, but we already had phys ed." (AB)	"If the provincial government is going to mandate 150 minutes of physical education a week, and that we firmly believe in quality daily physical education…we would not need to have this [D]PA policy." (SK)	"It was overall a fairly positive implementation and we've had some indication of physical activity levels over time." (MB)	
	Compatibility	"We struggle with the healthcare costs…and I think that the government saw this as our way of preventing and reducing the number of chronic diseases that will be seen from our children." (BC) "There was a goal put in place to make British Columbia the most active province for children leading up to that event [2010 Vancouver Olympic Games]. And so part of the conversation was thinking of policy strategies that could be put in place to support meeting that goal for the Olympics." (BC)	"It was really based on a combination of what was palatable and what we really knew from the science." (AB)	"In an ideal world we would have our daily physical education movement throughout the day…I think it needs to be both, [PE and DPA] but I do think the priority needs to be the physical education first." (SK)	"We were aware that the 55 hours wasn't going to meet the physical activity guidelines that were set…but it was seen as being as much as a school could really ask students to do without getting into a high failure rate. So I think it was a bit of a compromise there." (MB)	
	Complexity	"[Teachers felt] there was a lack of clarity, I think, with the policy." (BC)	"There was huge confusion as to what was DPA. Huge." (AB) "I would not say that there was a total understanding of the [DPA] initiative, everything that it involved in the initiative." (AB)	"The Ministry of Education, one of the curriculum directors at the time, spoke at a banquet and mistakenly stated it as Physical Education and then had to retract it and say it was physical activity… [and] acknowledge that they'd interchanged the words." (SK)	"We did our implementation sessions in the first couple of years…they were two-day sessions, and there was a lot of information shared. So clarifying the delivery model was part of it. Clarifying what the policy required, what complete/ incomplete meant." (MB)	"It's not really an extensive policy…it's really a statement…it's DPA, it's 20 minutes, it's continuous, it's sustained, it's grades one through eight." (ON) "It's easy to understand in terms of what is being asked." (ON)

Model Component	Attribute	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario
	Reinvention	"A few years later, I believe it was 2011, we did change the grade 8 and 9 model…We were trying to provide some flexibility in that [DPA policy] for the students, as well as the teachers." (BC)			"There were some policies that related to it that were adopted by individual school divisions around risk management." (MB)	"This policy has…been closed for ten years…It hasn't been altered, modified, updated, you know, anything." (ON)
	Observability			"The [Inspiring Movement policy] document has some real value in it, but I would suggest that many people who weren't in the direct line of seeing it and looking at it when it first came out, aren't really paying much attention to it." (SK)		"The sense I get from other provinces is…we're running into the same issues across Canada, with respect to other provinces having difficulty implementing [DPA]." (ON)
System antecedents for innovation; AND Implementation and routinization	Absorptive capacity for new knowledge	"In 2005 the province started Act Now BC, which was a cross government initiative which had some key focus areas: physical activity, healthy eating, tobacco, and [alcohol use during pregnancy]." (BC)	"[Gathered evidence by] reading books, reading articles. Evidence, listening, yeah common sense. It [DPA] is evidence based." (AB)	"There was a study conducted…to try to find out how provincial curriculum was being actualized in the province, with a part of that survey being about physical activity." (SK)	"There was a document that had been published, and it was the Healthy Kids, Healthy Futures Task Force Report. That was an all-party task force that did consultations and came up with I think it was over 50 recommendations…[That was] a fairly significant step in making phys ed mandatory." (MB)	"Whenever we develop a policy it's one of the first things that we do is a jurisdictional scan and particularly looking at our neighbours in Canada and seeing what they're doing…what successes, lessons learned…that we can use to leap off." (ON)
	Receptive context for change	"I think that one of the key things for us here in BC was that, we took a hard line and mandated it right away, and so there wasn't any if, ands, buts." (BC)	"It's really different than anything else Alberta Ed had ever done...That's why it was so ground-breaking, because Alberta Ed just didn't know what to do it. The minister wanted it." (AB)	"This province it's incredibly collaborative…People are genuinely really supportive of what's going on at the school." (SK)	"There were signs that things were happening at the Government level to explore, you know, maybe some policy changes or new directions in terms of the curriculum and the mandating of phys ed." (MB)	
	Structure	"The position no longer exists, but we had a shared position that was Healthy Schools BC Coordinator, so they provided the educational expertise when they were at the [Ministry of] Education, and then as well as the health expertise from [the Ministry of Health]." (BC)	"There was nobody in phys ed, so DPA changed that…They still don't have a specific physical education or physical activity ministry staff person, but they have three people that have part of that within their portfolio." (AB)	"The original Inspiring Movement document was created at the Ministry of Education…but the document was written in partnership with the Ministries of Health and Tourism at that time, Parks Culture and Sport." (SK)	"We brought in an extra consultant into the Department [of Education] to help with the development and the implementation of grade 11 and 12 phys ed." (MB)	"Back when it was developed…there would have been sector partners. We have what's called the Healthy Schools Working Table, so it's an in-camera advisory group that advises on Healthy Schools related policies." (ON)

Model Component	Attribute	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario
System readiness for innovation; AND Assimilation by the system	Innovation-system fit	"This was an opportunity for us to move forward and be seen... as more or less trailblazers and starting to really move the needle here in British Columbia by encouraging more physical activity within the school system." (BC)	"Yeah it's absolutely the right thing to do. We have a plethora of data that tells us that physical activity would support, not only the learning outcomes of the child, but the overall wellbeing. So initiatives such as DPA are very strong messaging and the right course of action for our students." (AB)	"From the ministry level, I never ran across anyone that disagreed that physical education and physical activity wasn't important, like no one ever said that to me." (SK)	"Through the consultations there…were concerns about obesity levels and inactivity. And so the thought was that if we can make physical education mandatory with a policy that required a certain amount of hours of moderate to vigorous physical activity in it, then you can kind of get at both." (MB)	"Everybody believes in [DPA]…conceptually they understand it." (ON) "[DPA is] necessary from some, but good for all." (ON)
	Dedicated time and resources	"Not specific funding that I'm aware of, but I do know that there was additional supports put in through teacher education …there was workshops that were offered…[and] resources that would make it easier for them to implement that requirement." (BC)	"In 2005 at the introduction of this policy there was extensive training that went on across the province, and there was a lot of resource development that went on to support teachers and schools." (AB)		"The department increased funding to the system…and it's a continued funding, it's still in place now…We did see an increase in phys ed staff…We developed a curriculum…And we also brought in an extra consultant." (MB)	"The government made a decision to invest, I think it was upwards of ten million dollars into the implementation of DPA." (ON)
	Capacity to evaluate the innovation	"We did the daily physical activity evaluation, the Minister of Education did that one, they brought together a whole group of stakeholders." (BC)	"Government doesn't tend to do [evaluation]. When they did, for example, the nutrition policy, it was outsiders who went to measure what the implementation of that was. It was never the Ministry of Health that really did a full assessment as to what was happening there." (AB)	"There have been [evaluations] to some degree…There's nothing that has been provincial wide… I kind of had an idea of how many kids were taking physical education in the province, but in terms of say how well they were doing, there isn't really a baseline in our province." (SK)	"The Youth Health Survey surveyed students on self-reported physical activity for two surveys in '08, and in 2012, and '08 was the implementation year of the phys ed policy." (MB)	"No, so but that is true for any element of the curriculum. We don't monitor or evaluate how [teachers] are doing geography or world issues, or math or anything like that…Monitoring and implementation is the responsible of the boards." (ON)
Outer context: Inter-organizational networks and collaboration	Political directives	"Our minister at the time...was quite supportive of [DPA] and definitely was taking a leadership role in supporting the development and the promotion of that policy…The Premier at the time...really was a lead in terms of developing the whole Act Now strategy." (BC)	"[DPA] was a government-led initiative from the start. It wasn't something that - like I don't know, a big group that was saying listen we need DPA in schools." (AB) "DPA is an example of when a minister has the right idea and he does something for the good of the people, and the ministry really wasn't ready." (AB)	"It just happened. It was in an election time and all of a sudden [DPA] was just there…When it came out it surprised [us]. We had no idea it was coming…I suspect that it was even bigger than the Minister of Education. I think it was political – trying to gain political support." (SK)	"It had a lot to do with the governing party...so when the new government came in, I think there was quite a lot of support for promoting active healthy lifestyles in schools." (MB)	"It was also part of a [Liberal party] platform commitment at the time…there would have been a commitment to basically have daily physical activity." (ON)

Model Component	Attribute	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario
	Inter-organization norm-setting and networks	"We had looked at…other provinces who had implemented or initiated physical activity. And I believe that Ontario was one and I think that Alberta was the other… The two other 'bigs', Ontario and Alberta." (BC)	"Organizations such as PHE Physical and Health Education Canada have tried to bring together people from across the country to discuss DPA." (AB) "[DPA was] a reaction to statistics around…our children being overweight or obese, …that's really when the [DPA] initiative…was born, out of that type of literature." (AB)	"When [the policy document] was written…Alberta had the big DPA push and Manitoba was…having compulsory physical education from K-12. So those were…the two provinces that were looked at quite closely. Ontario as well, cause their…DPA was coming out at that time as well. But I would say Alberta had a huge influence on the background information that the…[DPA policy] was built on." (SK)	"I know we were looking at partly the delivery of DPA in I believe Alberta at the time…BC had something similar, but there was no real connection with a teacher." (MB)	"Whenever we develop a policy it's one of the first things that we do is a jurisdictional scan and particularly looking at our neighbours in Canada and seeing what they're doing…what successes, lessons learned…that we can use to leap off." (ON)
Communication and influence	Network structure	"The key vehicle for conversation between the jurisdictions around healthy living topics is the Joint Consortium for School Health…I would say that's the key place where those jurisdictional conversations are going on." (BC)	"Our network was very strong across Canada because the phys ed world's pretty small... we all go to the same conferences and…we had a great social network as well as a professional network." (AB) "The main story that was going around is that [DPA] came about at a...Canadian Ministers of Education Conference, where people were kind of saying 'well we're doing this in our province', 'we're doing this' and then...our Minister of Education, said 'well we're doing daily physical activity'. And that's really how it came about." (AB)			"Through our membership through the Joint Consortium For School Health… [DPA policy] certainly would have been shared through that vehicle." (ON) "[DPA policy sharing] would just really be through networking." (ON) "[The policy is] available, obviously publicly on our website… it might have been circulated through other means other than us, like I mean it could be [a provincial physical activity organization] that could have been sharing that information." (ON)
	Boundary spanners	"There was no sort of intentional working together to kind of create a policy. More so sharing information on what are you guys doing, or what have you done already and kind of using that to help inform." (BC)	"We were also the only ones in Canada who had started this work, so everybody was looking to us." (AB) "I presented at some conferences in those other provinces, either invited or just applied." (AB)	"I was in quite a bit of conversation with the consultants from Alberta and Manitoba while I was working with the ministry in development of curriculum. And so we had those conversations about daily physical activity." (SK)	"I know we were looking at partly the delivery of DPA in I believe Alberta at the time…BC had something similar, but there was no real connection with a teacher." (MB)	"Whenever we develop a policy it's one of the first things that we do is a jurisdictional scan and particularly looking at our neighbours in Canada and seeing what they're doing…what successes, lessons learned…that we can use to leap off." (ON)