A Scoping Review of the Demographic and Contextual Factors in Canada's Educational Opportunity Gaps

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Abstract

Despite widespread discussion in the United States, up until now there has not been a review of the demographic and contextual factors associated with Canadian academic achievement. Using Arksey and O'Malley's (2005) framework, a scoping review was conducted to answer two questions: What demographic and contextual factors are most commonly used in K–12 academic achievement studies in Canada? What, if any, research gaps exist? Fifty-four studies were identified for review. The results reveal 40 demographic or contextual factors, with socio-economic status (SES), gender, language factors, immigrant status, family structure, and Indigenous status being the most commonly studied. Race, religion, and LGBTQ+ identity were understudied factors.

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The authors recommend the adoption of "educational opportunity gap" as a consistent research term, identify understudied factors, and outline several research design considerations.

Keywords: educational opportunity gap, achievement gap, scoping review, disaggregated data, academic inequities, Canada

Résumé

Malgré le débat largement répandu aux États-Unis, jusqu'à maintenant, aucune étude n'a été effectuée en contexte canadien sur les facteurs démographiques et contextuels associés au rendement scolaire. En se basant sur le modèle d'Arksey et O'Malley (2005), un examen de la portée a été mené afin de répondre à deux questions : quels sont les facteurs démographiques et contextuels les plus couramment utilisés dans les études du rendement scolaire de la maternelle à la 12e année au Canada ? Quelles sont les lacunes, s'il y en a, dans la recherche sur le sujet ? Cinquante-quatre études ont été recensées. Les résultats révèlent 40 facteurs démographiques ou contextuels, parmi lesquels le statut socio-économique, le genre, la langue parlée, le statut d'immigrant, la structure familiale et le statut d'autochtone sont les plus étudiés. L'ethnie, la religion et l'identité sexuelle (LGBTQ+) sont identifiées comme les facteurs les moins étudiés. Les auteurs suggèrent l'adoption du terme de recherche « fossé des possibilités éducatives », repèrent les facteurs encore peu étudiés et font ressortir plusieurs projets de recherche à considérer.

Mots-clés : fossé des possibilités éducatives, écart de rendement, examen de la portée, données ventilées, inégalités scolaires, Canada

Introduction

Since James S. Coleman (1966) documented significant racial and socio-economic gaps in academic achievement, US researchers and education policymakers have studied the impact of demographic and contextual factors on academic achievement. Demographic factors are individual-level descriptors, like gender or race, while contextual factors are community-level descriptors, like the ethnic diversity or socio-economic status (SES) of a neighbourhood or community (Hillemeier, Lynch, Harper, & Casper, 2003). An informal literature search to examine differences in education attainment revealed that while there is widespread research in the United States on the "achievement gap," Canada lacks a cohesive examination of educational inequities along several contextual and demographic lines. This scoping review will therefore examine the breadth, depth, and gaps in the research on demographic and contextual factors in Canadian K–12 academic achievement.

This review, to the best of the authors' knowledge, is the first attempt to date to synthesize this literature. Complicating this review is the lack of an agreed-upon umbrella term for educational inequities in Canada. In the United States the term "achievement gap" is used, but in Canada a wide range of terms are utilized. Therefore, a scoping review was selected as the methodology, as it is designed for topics that are complex or being reviewed for the first time (Arksey & O'Malley, 2005); both are true in this case. Formal scoping reviews have been conducted to examine key demographic and contextual factors in published quantitative studies on the Canadian context. Following an overview of the research methodology and search results, the most significant findings are discussed and implications for future research are articulated.

It is important to examine which factors have been studied and which are missing, as this information is needed to identify and intervene in any systemic differences in academic opportunities for particular groups in Canada. In assessing the existing quantitative data, this review uses a critical educational theoretical framework (Ladson-Billings, 2006). The authors are aware of the dangers of replicating the US neoliberal school movement and discourse, which has too often placed blame on individual students and groups and has perpetuated inequalities through the privatization of schooling and standardized testing (Baldridge, 2014; Gillborn, 2005, 2008; Martino & Rezai-Rashti, 2013; Rebell & Wolff, 2008; Tuck, 2009). To this end, the scoping review in this research does

not use the "achievement gap" framing, but instead opts for the theoretical framing and terminology of an "educational opportunity gap." The educational opportunity gap approach does not focus on individual failings, but considers systematic inequities in learning opportunities for particular groups (Darling-Hammond, 2013). Further, this research adopts an intersectional approach, which simultaneously considers the impact of multiple forms of identity and difference on an individual's or group's circumstances (Cole, 2009), in this case with the aim of understanding academic differences.

Methods

Overview of Scoping Review Method

A scoping review is a systematic literature review that is designed to map topics rapidly, summarize research findings, and identify gaps in the literature (Arksey & O'Malley, 2005). Unlike a meta-synthesis, which typically focuses only on qualitative research and is intended to be as exhaustive as possible (Thunder & Berry, 2016), a scoping review can assess quantitative or qualitative data and is specifically designed for topics being reviewed for the first time or complex subjects (Arksey & O'Malley, 2005). Scoping reviews, having identified commonalities and gaps in the research, are sometimes used to design a new study or to inform a subsequent systematic review.

This review used the model of scoping reviews proposed by Arksey and O'Malley's (2005), taking some of Levac, Colquhoun, and O'Brien's (2010) suggestions to improve this methodology. Arksey and O'Malley (2005) articulate a five-stage framework: (1) identify the research question, (2) identify relevant studies, (3) select the studies, (4) chart the data, and (5) summarize and report the results. Drawing from Levac et al.'s (2010) recommendations, steps three and four are treated as iterative, rather than linear, processes. This is appropriate because of the lack of a singular unified keyword or phrase to describe the phenomenon in question in the Canadian context.

Boundaries of the Review

This review centred on the following questions: What demographic and contextual factors are most commonly used in K–12 academic achievement studies in Canada? What, if any, research gaps exist?

Due to the limited literature, a decision was made to extend beyond the typical 10-year boundary for scoping reviews; thus, the search included peer-reviewed articles published between January 1, 2000 and April 1, 2017. Further, it was decided that articles included in the review must be written in English, due to the cost and time required for translation. This decision notably excludes articles in French, which is a limitation of this review, given the Canadian bilingual context.

Selection Criteria

After conducting an informal review, the two authors defined initial inclusion and exclusion criteria. The following *inclusion criteria* for articles were determined:

- Focused on academic achievement differences, inequities or gaps across demographic, social, identity and other contextual factors;
- Focused on K–12;
- Published between January 1, 2000 and April 1, 2017;
- Published in a peer-reviewed journal;
- Used a quantitative or mixed-method design;
- Used internal school or external academic measurement as the dependent factor (e.g., standardized test score or GPA);
- The review allowed data sets that contained preexisting secondary data analysis;
- The review allowed studies with cross-national comparison if Canadian-specific data were provided.

In addition, the following *exclusion criteria* were determined:

- Published as grey literature, including education policy documents;
- Provided theoretical or policy content with no new data on achievement;
- Focused on early childhood (prior to kindergarten);
- Focused on post-secondary education;

- Utilized only qualitative design;
- Utilized as the only independent variable: a physical, intellectual, or developmental dis/ability (e.g., students with hearing impairments); a psychological/cognitive factor (e.g., self-motivation); an individual educational variable (e.g., past literacy scores); or a school-related variable (e.g., teacher experience);
- Utilized as the only dependent variable a self-report of academic engagement, aspirations, or motivation, without any academic achievement measurement.

After the initial search selection, it was necessary to determine whether to include empirical multinational studies and evaluations of achievement gap interventions or policies. Using Levac et al.'s (2010) iterative process for scoping reviews, where new exclusion and inclusion criteria are added during the process if unexpected grey areas emerge during the selection process, both authors agreed to add two new exclusion criteria. Multinational studies that explicitly included Canadian data and disaggregated it from other countries would be included. Further, articles focused on intervention strategies would only be included when new information on Canadian demographic or context factors were offered. Therefore, two additional exclusion criteria were added in order to make determinations about several articles:

- Focused on educational interventions or policy;
- Provided cross-national data but did not include disaggregated data on Canada.

Study Selection

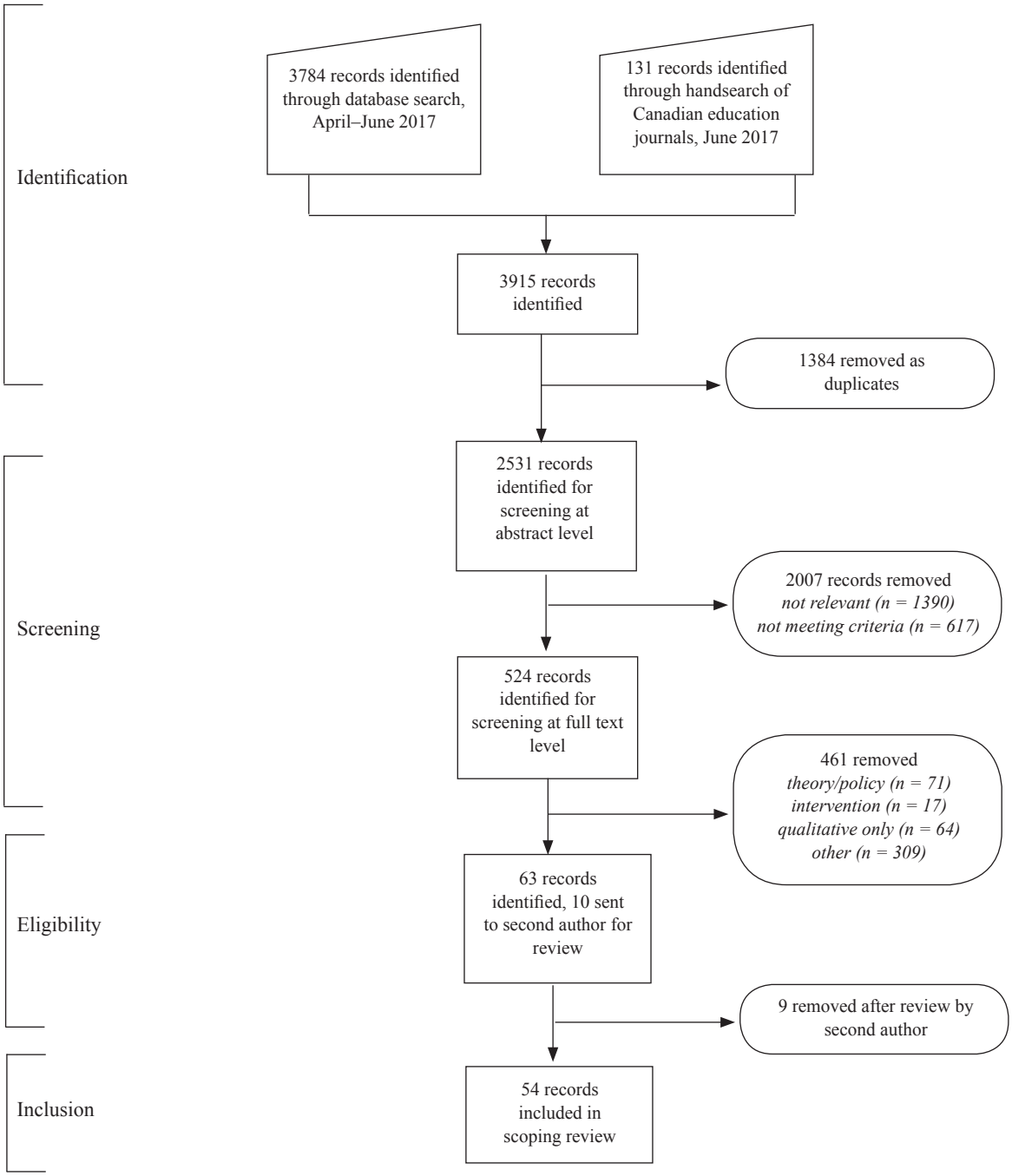

Figure 1. Scoping review process

Figure 1 presents a flowchart demonstrating the study selection process. The search was conducted between April and June 2017, using Primo Central Index with the categories of education, law, psychology, public health, and social sciences selected.

- A first search for peer-reviewed articles from 2000 to 2017 was conducted using the terms "achievement gap" AND Canad*, yielding 1,119 articles.
- A second search used the terms "educational inequity" AND Canad*, yielding 1,015 articles.
- A third search used the terms "at risk" AND academic AND Canad*, yielding 1,004 articles.
- A fourth search used the terms "opportunity gap" AND academic AND Canad*, yielding 646 articles.

The 3,784 results were compiled.

An additional hand search for relevant articles was conducted, using five major Canadian education journals: *Canadian Journal of Education* (*n* = 63), *Canadian Journal of Native Education* (*n* = 15), *Canadian Journal for New Scholars in Education* (*n* = 6), *McGill Journal of Education* (*n* = 15), and *Alberta Journal of Educational Research* (*n* = 32). The hand search led to the inclusion of 131 articles. In total, 3,915 articles were selected during the identification phase.

Next, duplicates were removed and included articles were screened for the review, first at the abstract and then at the full text level. Notably, many articles were removed for articulating theory or policy recommendations (*n* = 71), presenting intervention data *(n* = 17), or providing only qualitative research (*n* = 64). Ten articles were deemed questionable by the first reviewer and were sent to the second reviewer for discussion; nine of these were excluded based on the criteria.

Fifty-four articles met all criteria and were read in full and synthesized by the first author. Please the table in Appendix A which was created to synthesize and chart the data found during the scoping review.

Results

This section reports the terminology, demographic and contextual factors, and research design elements of the 54 reviewed articles.

Terminology

The scoping review results yielded no consistent term for describing educational inequities in Canada, with 39 different terms identified. The most popular terms were as follows: "achievement gap" (n = 9), "academic achievement" *(*n = 5), "achievement" (n = 4), and "educational achievement" (n = 2). Other terms like "at risk," "dropout," and "educational inequity" were also noted. Many authors did not use a consistent term in their article, in which case the reviewers informally assessed which term was used most commonly in the article (see Appendix A). Further, the keywords for these articles demonstrated little consistency.

Demographic and Contextual Factors

The results revealed 40 discrete demographic or contextual factors, which are broken down by frequency in a table in Appendix B. Some of these factors were addressed by only one published study meeting the selection criteria for this review (e.g., disabled parents were addressed by Chen, Osberg, & Phipps, 2015; experience in childcare by Geoffroy et al., 2010; and age of arrival to Canada by Anisef, Brown, Phythian, Sweet, & Walters, 2010). Others factors, such as SES and gender, account for the focal terms in many of the articles. The most commonly studied factors were as follows: SES (n = 34); gender (n = 21); language (n = 11); immigrant status (n = 10); family structure (n = 10); and Indigenous status (n = 8). Importantly, we included factors either if they were the primary focus of the article or if the researchers specifically reported the results of controlling for this demographic or contextual factor. A summary of select demographic and contextual factors follows below.

SES. SES was the most commonly studied factor (n = 34). According to the Programme for International Student Assessment (2017), Canada consistently ranks as one of the most equitable education systems among OECD countries, which may be attributable to the provincial public school funding formula that ensures that rich and poor districts receive similar funding. While many of the studies in this scoping review used PISA or other major database data that present Canada in a favourable light (n = 9), researchers nevertheless indicated educational differences between students of lower and higher SES backgrounds in Canada (Benito, Alegre, & Gonzàlez-Balletbò, 2014; Castejón &

Zancajo, 2015; Chmielewski & Reardon, 2016; Edgerton, Peter, & Roberts, 2008, 2014; Hampden-Thompson, 2013; Hanushek & Luque, 2003; Perry, 2009; Schnepf, 2007).

Authors provided a range of theories to explain the relationship between SES and achievement. Anisef et al. (2010) suggested the relationship be understood through social capital theory, where students with higher SES have access to networks of support, information and services, and similar social backgrounds, which help with school success and future employment. Maggi, Kohen, and D'angiulli (2004) and Roos et al. (2006) focused not on individual SES, but the importance of neighbourhood SES. As Friesen and Krauth (2010) theorized, the provincial public school funding formula ignores that students typically live in relatively homogenous communities, and therefore systemic differences in fundraising, school resources, and teacher preferences may exacerbate SES-based educational gaps. Articles demonstrated a range of findings in terms of the importance of SES and understanding why this factor has remained a persistent predictor of educational success.

Gender. While gender was commonly studied ($n = 21$), there is little consensus in the findings, with some studies depicting girls outperforming boys, some showing boys outperforming girls, some demonstrating stratified differences across subjects, and others arguing that an intersectional approach is needed to determine which boys are not performing as well.

White (2007) argued that the panic over underachieving boys might be greatly overstated due to studies not controlling for other background factors. White's (2007) model suggested gender accounted for less than 1% of the variance in reading achievement, strengthening the notion that gender-based underachievement may be overstated. Similarly, Kingdon, Serbin, and Stack (2017) explored the intersectionality of SES and gender, finding that the gap between girls outperforming boys widened in groups of lower-income students. Interestingly, Bouchard and St-Amant's (2000) research suggested that the more an individual conforms to gender stereotypes, the more their achievement suffers. The review thus revealed that tensions and contradictions emerge in assessing "gender gaps." These examples point to the need for careful research that accounts for the complexity of student backgrounds in determining whether a "gap" exists between groups.

Immigrant status. Ten studies examined differences in educational attainment dependent on immigrant status. The authors of this review chose the general term "immigrant status" to indicate studies that explored the relationship between immigration and education; however, the studies' authors defined immigration status in a variety of ways, variously using the child's country of origin, the kind of immigration status or class that has been granted, or the generational wave of immigration to which the child belongs (e.g., born outside of Canada, born in Canada to parents who have recently immigrated).

Many of the cross-national studies (n = 5) demonstrated that immigrants in Canada fare well in comparison to other countries such as the United States, the United Kingdom, and France (Benito et al., 2014; Cobb-Clark, Sinning, & Stillman, 2012; Hochschild & Cropper, 2010; Riederer & Verwiebe, 2015; Schnepf, 2007). As Schnepf (2007) stated, Canada has one of the lowest differences in education attainment between immigrants and "native" Canadians; once language is controlled for, the difference largely disappears. Yet, it is important to note that several studies in this scoping review demonstrated there is a significant gap between those who are either first- or second-generation immigrants and "native" Canadians (Anisef et al., 2010; Cobb-Clark et al., 2012; Hochschild & Cropper, 2010; Ma, 2001; Ma & Crocker, 2007; Riederer & Verwiebe, 2015; Schnepf, 2007; Toohey & Derwing, 2008). Additionally, some of the studies examined how generational differences impact achievement (Anisef et al., 2010; Cobb-Clark et al., 2012; Hochschild & Cropper, 2010; Ma, 2001; Riederer & Verwiebe, 2015; Schnepf, 2007). Hochschild and Cropper (2010) demonstrated very small differences between second-generation immigrant students and "native" Canadian students, suggesting that by the second generation the gap narrows.

Importantly, several studies examined education differences in subgroups of immigrants, finding significant differences dependent on region of birth/ethnicity (Anisef et al., 2010; Bakhshaei, Georgiou, & McAndrew, 2016); language (Bakhshaei et al., 2016; Cobb-Clark et al., 2012; Toohey & Derwing, 2008); age of arrival (Cobb-Clark et al., 2012); and SES (Anisef et al., 2010; Bakhshaei et al., 2016; Toohey & Derwing, 2008). Toohey and Derwing's (2008) study explored differences in educational attainment based on immigration class (independent, family sponsored, or refugee), finding that students whose parents immigrated based on the independent category graduated in Vancouver at a far higher rate than those who immigrated under the family class or refugee status classes. The reviewed studies point to the importance of examining how well immigrants

actually fare in Canada, particularly when additional demographic and contextual factors are explored.

Indigenous status. Eight articles included in the scoping review demonstrated that Indigenous students face educational disparities (Aman, 2008; Brade, Duncan, & Sokal, 2003; Friesen & Krauth, 2010; Ma & Klinger, 2000; Philpott & Nesbit, 2010; Puchala, Vu, & Muhajarine, 2010; Richards, Vining, & Weimer, 2010; Steeves, Carr-Stewart, & Marshall, 2010). Ma and Klinger (2000) found that "Native ethnicity" was the single most important factor in their multi-variable study, and remained strong even after controlling for SES, attributing these differences to "unsuccessful incorporation into the mainstream culture" (p. 51).

While some have written about this population's achievement differences, comparing it to the Black–White achievement differences in the United States (Friesen & Krauth, 2009), the authors of this review believe it is critical that these data be viewed through an opportunity gap theoretical lens. As explained in this article's theoretical framework, what matters is not simply the "output" differences, but rather the contextual "input" differences in terms of bias in teaching, structural disparities, underfunded educational programs, the historical context of residential schools, and so on. The studies included here that address educational disparities that Indigenous students face also discuss the importance of considering the influence of SES (Brade et al., 2003; Richards et al., 2010; Steeves et al., 2010); language issues (Brade et al., 2003); disability diagnoses (Friesen & Krauth, 2010); culturally appropriate curriculum, teaching, and/or testing (Philpott & Nesbitt, 2010; Richards et al., 2010; Steeves et al., 2010); historical trauma and the history of residential schooling (Brade et al., 2003; Philpott & Nesbitt, 2010; Steeves et al., 2010); students changing schools (Aman, 2008; Brade et al., 2003); teacher quality, experience, and/or turnover rate (Friesen & Krauth, 2010); school attendance (Philpott & Nesbit, 2010); and school environment and/or population (Brade et al., 2003; Friesen & Krauth, 2010; Puchala et al., 2010; Richards et al., 2010). A holistic view of educational differences is therefore critical when exploring Indigenous identity factors.

Other findings. While providing details of all 40 factors was not feasible within this scoping review, a few additional findings can be briefly outlined. Some factors, such as country of origin ($n = 2$), educational policy in country of origin ($n = 3$), language

factors (n = 11), education factors (n = 4), and ethnicity (n = 5), overlap with a focus on immigration status and student success. The studies addressing these factors suggested that nuanced examinations of intersectional factors can illuminate which students struggle in Canadian systems and may reveal opportunities to develop policies that target the specific needs of newcomer youth. For example, Puchala et al.'s (2010) study found that high ethnic diversity in a child's neighborhood mitigates the negative effects of ESL status on achievement. Further, only three of the reviewed articles examined the role of Canada's national policies on student success (Hampden-Thompson, 2013; Perry, 2009; Riederer & Verwiebe, 2015), suggesting there may be a need to examine both the impact of the national context and the effectiveness of existing national educational policies.

Further, there are a large number of factors (n = 26) that have only been studied once or twice, including biological risk factors (n = 1), neighbourhood characteristics (n = 2), and urban versus rural settings (n = 2). (For a complete list of factors and their frequency, see Appendix B.) The authors also identified potentially significant factors that were not studied in the reviewed articles, including LGBTQ+ identity, religion, and racial identity. The importance of these understudied factors is discussed later in this article.

Research Design Overview

The majority of studies were cross-sectional (n = 39), with fewer using longitudinal design (n = 14) or both (n = 1). Further, almost every study (n = 49) relied either exclusively on secondary data analysis of preexisting datasets, or included secondary data analysis along with survey research design. The most common dataset used was PISA (n = 16). A wide range of academic measurements (n = 29) were identified as dependent variables. Most studies utilized some form of standardized testing (n = 51). Relatively few used a measure that is cumulative (n = 13), such as high school completion/dropout rate, GPA, or failure to accumulate basic credits in Grade 9. (See Appendix A for a breakdown of the use of datasets and academic measurements.) Finally, a significant portion of the studies drew from multinational datasets that included Canada-specific data (n = 12) or were Canada-wide (n = 9). The provincial and territory breakdown for sample location is as follows: Ontario (n = 9), British Columbia (n = 7), Quebec (n = 6), Manitoba (n = 4), Alberta (n = 3), New Brunswick (n = 3), Saskatchewan (n = 2), Newfoundland and Labrador (n = 1), Nova Scotia (n = 1); no studies used samples that included Prince

Edward Island, Nunavut, Yukon, or the Northwest Territories. Several provinces and territories are clearly understudied.

Discussion

The first major finding is that, unlike the US literature, the Canadian literature has not uniformly adopted any umbrella term to describe educational inequities, with 39 different terms being used in the reviewed studies. This may potentially limit Canadian researchers' and educators' ability to access this information easily and build on previous research. It also suggests that there is a lack of consistent discourse or theorizing about educational inequity in Canada. Canada does not have a federal department of education or an integrated national education system, with each province and territory being responsible for the organization, delivery, and assessment of education, as well as determining what data are gathered on academic performance. Further, given Canada's high education rankings among Organisation for Economic Co-operation and Development (OECD) countries, there has not been the same push for data collection and school reform as in the United States. These differences may be useful in understanding why Canada has neither clear terminology nor a clearly organized research effort around educational inequities.

Adopting a unified term in the Canadian context may be warranted to facilitate research dissemination and to assess if educational inequities exist along various demographic and contextual lines. Despite its ubiquity in the United States, we would be wary of adopting the popular term "achievement gap," due to the significant critique of achievement gap discourse and education policy—see Baldridge (2014); Gillborn (2005, 2008); Ladson-Billings (2006); Martino and Rezai-Rashti (2013); Rebell and Wolff (2008); and Tuck (2009). These authors suggest that this theoretical framing promotes deficit language and "damage-centered narratives," reignites conversations about a genetic or "cultural deficit" basis for differences, and increases neoliberal ties to mass testing, market-driven education, and systems of accountability where data are presented discursively to suggest. We would not recommend Canada adopt this language or discourse, which centres on documenting individual failures rather than providing opportunities to change educational success. Instead, we suggest the use of "educational opportunity gap" (Baldridge, 2014). An opportunity gap perspective directs the research focus away

from "individual failings" onto the system's inequities and the systematic denial of equal educational opportunities. We suggest that this shift in focus is more likely to encourage research and interventions focused on systemic changes to opportunities, rather than merely individual-centred interventions. Notably, none of the articles we reviewed use the term "educational opportunity gap."

The results of the scoping review revealed that a wide number of factors have been studied; however, only a relatively small number have been examined more than five times. Importantly, Klinger, Rogers, Anderson, Poth, and Calman (2006) suggest, "Canada has a long history of collecting information on student achievement of learning outcomes, as well as characteristics of students, schools, and communities; however, the anonymous and/or incomplete nature of the data have resulted in restricted analyses" (p. 773). Therefore, what follows is a discussion of select demographic factors and future research implications, as well as significant gaps in the research.

SES. As reported above, over half of the studies found SES significant in determining the magnitude and direction of educational opportunity gaps. This is important, given that the latest statistics show that the poverty rate in Canada is increasing every year, with approximately one in five children living below the national poverty line (Canada Without Poverty, n.d.). SES is one of the most persistent predictors of academic attainment; however, there is ongoing debate about why this is the case. As Davies and Aurini (2013) wrote, "Researchers continue to debate the relative weight of evidence that traces [SES gaps] to biases in school teaching, curricula, and organization, or to resource inequalities among households and neighbourhoods (Conley & Albright, 2004). These attributions each imply different policy solutions" (p. 288). As the reviewed research uses inferential statistics, it remains limited in understanding both the cause of the differences and what might be needed to reduce opportunity gaps. Further, while the scoping review allowed for mixed methods research studies, only one study (Bouchard & St-Amant, 2000) used a mixed methods research design. Mixed methods studies can often be useful in understanding the relationship between variables, because the qualitative data can offer rich information about lived experience.

Based on the analysis of these articles, researchers tended to attribute SES-based gaps to differences in early childhood, social capital, access to wrap-around or alternative learning opportunities, and/or school resources based on neighbourhood SES. Notably

absent from the discussion sections of the reviewed articles was the potential impact that chronic stress stemming from poverty might have on learning. This absence is significant given recent studies that have demonstrated links between chronic stress and cognitive functioning, executive functioning, and learning (Evans & Fuller-Rowell, 2013; Kaplan et al., 2001; Mani, Mullainathan, Shafir, & Zhao, 2013).

Further, there was marked variation in how SES was operationalized in the reviewed articles. Due to the difficulties in determining household income, researchers used a variety of proxy factors to approximate SES (see Appendix C). About half of the studies (n = 19) used multiple proxies for SES or created a composite SES score based on a range of factors. As Appendix C indicates, nine drew on neighbourhood or zip code census data to determine an approximate income, which limits the specificity and accuracy of correlations between SES and academic achievement at the individual level and data at the national level. More problematically, educational-oriented SES proxies, such as parental highest level of education, educational possessions (e.g., number of books in a house), or access to social and cultural educational activities (e.g., visits to museums or art galleries), were at times implemented (Bouchard & St-Amant, 2000; Ma, 2001; Ma & Klinger, 2000). Using educational proxies as a substitute for SES may influence the results of a study focused on education, as the strength and nature of the associations among factors may be difficult to identify due to confounding explanations. For example, using proxies like a parent's education, access to reading material, and/or access to educational events might influence a child's education differently than the maternal age of the first child's birth or a parent's occupation.

While recognizing that many of these studies used preexisting datasets and were therefore limited by the information contained in them, we would recommend that whenever possible researchers seek the family income level, rather than neighborhood or zip code approximates. Further, when income level cannot be collected, we recommend that researchers use composite measures, but avoid relying solely on education variables (such as parental educational level or the number of books in a home) to approximate SES.

Immigrant status. As discussed, several of the multinational studies show Canada as having one of the smallest educational attainment gaps for immigrant students. However, based on the results of the scoping review, it can be suggested that these

cross-national comparative studies do not provide the needed nuanced examination of Canada's immigrant and education policies. As Hochschild and Cropper (2010) discussed, Canada has perhaps too often been held up as the model for immigration policy and integration. Because Canada actively pursues an immigration policy that targets immigrants who have the capacity to be rapidly incorporated and who are highly skilled, educated, and have French or English proficiency, the comparative small differences may not be due to Canada's education or multiculturalism policies but rather due to immigration policy (Hochschild & Cropper, 2010; Schnepf, 2007).

Further, while the results of the scoping review suggest that studies have begun to carefully examine variations in academic success across various subgroups, these contextual and demographic variables should be examined intersectionally, for example considering immigrant status with ethno-racial identity. Additional nuanced research is needed on the differences between various generations of immigration (e.g., first-generation, second-generation); different forms of immigration (family sponsorship, immigration through point system, forced migration or refugee status); language considerations; age of migration; and intersectional considerations between immigrant status and other factors.

Indigenous status. As indicated in the results section, eight articles demonstrated that Indigenous students face educational disparities. It is critical that the inequity of education outcomes must be understood through the historical, legal, social, and economic contexts of Indigenous populations in Canada. This must include looking intersectionally at the impact of SES, reserve vs. provincial schooling, treaty agreements regarding education and land, and what Brave Heart and DeBruyn (1998) described as "historical unresolved grief" (p. 56). Furthermore, as the Truth and Reconciliation Commission of Canada (2015) powerfully articulated, residential schooling and education itself was a place of physical, sexual, and cultural violence. This context must be taken into account when examining any educational outcomes for Indigenous students. Researchers should consider the potential harm that may result from focusing simply on improving test scores for this community. As Brade et al. (2003) suggested, researchers must be careful to consider whether the pursuit of these scores is a worthy goal, or is simply about assimilation to white culture.

Philpott and Nesbit's (2010) discussion of the largest learning needs assessment of Indigenous students in Canada provides an excellent overview of the complexity of

Indigenous education in the Canadian context, as well as policy and program recommendations following their assessment of ability, achievement, risk factors, attendance profiles, and other information on an entire culture of Innu children. It is to be strongly recommended that any research that reports differences in achievement with Indigenous students be framed from an opportunity gap theoretical lens, and include in its theoretical orientation and discussion both the historical and current inequities which contribute significantly to these differences.

Understudied factors. Finally, it is important to consider not only which factors were common in the scoping review, but also gaps in the research. The scoping review revealed some social factors that were not considered by any studies meeting the screening criteria, including LGBTQ+ identity, religion, and, most surprisingly, race. Climate surveys examining students' perceptions of safety and inclusion in school have suggested that LGBTQ+ students face greater stigma and peer harassment, thus warranting an examination of educational opportunity gaps (Craig, Tucker, & Wagner, 2008; Kosciw, Greytak, & Diaz, 2009; Ryan & Futterman, 1998). Craig and Smith's (2014) study, for example, indicated that perceived discrimination experienced by multiethnic sexual minority youth significantly influenced their school performance. Given this research, studies pertaining to opportunity gaps for LGBTQ+ students in the Canadian context are needed.

Similarly, given the rise of anti-Muslim rhetoric, a need for research exploring opportunity gaps for Muslim students may be indicated. Zine's (2004) qualitative study demonstrated a need to disrupt Islamophobia in Canadian schools. Additionally, Hindy's (2016) report on Ontario public schools suggested that Muslim students experience feelings of isolation, peers and teachers lack awareness about Islam, and there is a lack of representation of Muslims in the curriculum. It may be important to consider how other religious minority students, as well as agnostic or atheist students, are faring in Canada. Further studies exploring the relationship between religious identity and educational opportunities are needed.

Finally, given the overwhelming focus of "achievement gap" studies in the United States on educational differences for racialized students, it was surprising not to find any similar studies in Canada meeting the criteria for this scoping review. While ethnicity is sometimes used as a euphemism for racialization in Canada, only five studies included

ethnicity as an independent factor. We interpret this lack of data on race and achievement as stemming from Canada's avoidance of collecting disaggregated racial data. Most school districts and standardized assessments do not collect race-based data, limiting researchers' ability to examine the ways in which particular groups may face greater academic challenges. As Pon (2009) suggested, the "ontology of forgetting" allows Canada to see itself as fair and multicultural, while ignoring pervasive racism (p. 66). Similarly, Rodney and Copeland (2009) suggested that "the official discourse of multiculturalism makes it difficult to speak of race and racism in Canada" (p. 817). They remind readers, however, that "whenever data are collected in Canada based on race, disparities are observed" (p. 821).

Importantly, the Toronto District School Board (TDSB) does collect disaggregated race and ethnicity demographics, and has recently made data demonstrating race-based disparities available to the public. James and Turner (2017), arguing for the reporting of disaggregated race-based data, wrote, "Despite its limitations, the TDSB data offers useful insights into the schooling and education of Black students beyond what any other data source currently provides—including the Canadian Census—and is the only source of its kind that exists in Ontario and in Canada generally" (p. 4). In September 2017, Ontario Education Minister Mitzie Hunter announced that all Ontario schools would collect this data, which may result in studies exploring the impact of racial identity on equitable educational opportunities (Government of Ontario, 2017).

When researchers conduct new studies, the collection of race and ethnicity based data is recommended in order to expand this research. Alternatively, when collecting data for secondary data analysis from either international studies or district school boards, researchers should be encouraged to ask that this information be collected in the future and to communicate its importance in understanding whether some students face racial inequities and systemic educational opportunity gaps.

Implications for Future Research Design

Analysis of the overarching research design of the studies included in the review (sample location, research design, data set, and academic measure) reveals a number of gaps to be filled by future research.

Sample Locations

The sample locations show that the majority of studies drew from multinational datasets that included Canada-specific data. While useful as comparison studies, these articles drawing on multinational databases provided little nuanced information. Further, the provincial and territorial breakdown suggests several areas of Canada are understudied.

Cross-Sectional vs. Longitudinal Design

The majority of studies had a cross-sectional survey design, primarily relying on a single-time individual score on a standardized test. As Roos et al. (2006) argued,

> Testing tells only part of the story… What is not known is how many students missed a test because they were not in school on a test day, because they had fallen one or more years behind their cohort, or because they had dropped out. (p. 685)

Data are limited for academic measurements taken in schooling (e.g., Alberta's high school completion exams or PISA testing at age 15), where students facing larger opportunity gaps may no longer attend regularly, or the data may be gathered too late for meaningful educational interventions to be implemented. As Roos et al.'s (2006) longitudinal study revealed, a single-time assessment of educational achievement not only fails to capture a population of students who miss the test, but also "will overestimate the performance of groups at risk for poor outcomes and provide distorted, inaccurate comparisons of school performance" (p. 698).

Further, Jang, Dunlop, Wagner, Kim, and Gu's (2013) longitudinal study of immigrant English language learners demonstrated that early achievement gaps disappear the longer the students live in their target language community, and that these students outperform monolinguals after five years. They suggested that longitudinal studies challenge the short-term deficit view and provide a more holistic contextual picture of this population. Kingdon et al. (2017) provided the first longitudinal study tracking the academics of boys and girls across the full course of schooling, which established new information in understanding the development of the gender gap. The limited number of longitudinal studies suggests a need to report longitudinal educational research on inequities. We also suggest that cumulative academic measures, such as: GPA, literacy or numeracy, failure

to accumulate basic credits in Grade 9, or the high school completion/dropout rate, might provide a more holistic account of a student's long-term educational success.

Intersectional Design

While many of the studies created complex, nested models and used Hierarchal Linear Modeling, it is important to note that many failed to explore interactions between two or more contextual factors on academic outcomes. Only three articles were framed from an intersectional theoretical lens—Kingdon et al. (2017); Serbin, Stack, and Kingdon (2013); and White (2007). Each of these highlighted the importance of examining the "gender gap" intersectionally, particularly in terms of SES and age, finding that differences tend to become larger during secondary school. Several researchers pointed to the importance of accounting and controlling for multiple demographic factors when studying gender in order to take into account the complexity of demographic backgrounds in determining whether a "gap" exists between groups (Bouchard & St. Amant, 2000; Kingdon et al., 2017; Serbin et al., 2013; White, 2007). Indeed, as Martino and Rezai-Rashti (2013) argued, "an interactional or intersectional analysis that takes into account questions of identity, culture, race, and social class is needed when interpreting test scores" (p. 599). It should be recommended that, when possible, researchers consider a wide variety of demographic and contextual factors, not only separately, but also to look at their potential interaction with one another.

Databases

Almost every study relied heavily or exclusively on secondary data analysis of preexisting datasets, with PISA serving as the most common source of data. Most used some form of standardized testing to measure the academic outcome. While large-scale learning outcome data can certainly be useful in understanding demographic and contextual factors in education, the over-reliance on these preexisting datasets is problematic in four ways. First, this reliance necessarily limits the type of information that can be analyzed, based on the previous design of the instrument and data collection. Given the need for studies on demographic factors not typically included in these datasets, ongoing reliance on these sources of data will continue to perpetuate the existing gaps.

Second, as Klinger et al. (2006) suggested, many of the large-scale assessments (PISA, PIRLS, TIMMS, SAIP, etc.) are "low-stakes" tests paired with survey data, which neither teachers nor students are particularly motivated to fill out. They write, "Because of the low-stakes of the test, it can be argued that students are less motivated to produce their best work, teachers are not motivated to encourage maximum student performance, and not all survey items are answered, leading to problems with data quality or missing data" (p. 775).

Third, as Perry (2009) articulated, some researchers have questioned whether these assessments are culturally relevant, pointing to problematic test items. Similarly, Cheng, Klinger, and Zheng (2009) wrote that "large-scale, high-stakes literacy testing is particularly problematic for vulnerable groups of students who are second language learners, or who have had little formal education in the language being tested" (p. 121). In these cases, the academic measure may fail to account for a student's academic ability based on cultural or linguistic differences.

Finally, many of these datasets utilized standardized testing results to determine success and equity. Martino and Rezai-Rashti (2013) pointed out the danger of using PISA as the measure, suggesting this form of evaluation might direct our attention towards school reform, testing, and privatizing the school system through charter schools, rather than considering the need for social policy to address disadvantages for particular populations. Indeed, the neoliberal educational reform efforts in the United States that focus on standardized testing have been shown to place marginalized youth at further disadvantage. Testing, rather than being used as a tool to illuminate disparity, has instead become the "solution" (Baldridge, 2014).

Similarly, Tuck (2009) points out the danger of relying on "damage-centered narratives" in education, where educational policies focus on documenting failure through testing and accountability, rather than providing opportunities to change inequities. Provincial agencies such as Ontario's Education Quality and Accountability Office, Alberta Education, and the British Columbia Ministry of Education Assessment have been criticized for focusing on large-scale testing to measure "success," creating high social and fiscal costs that divert money away from the classroom, and using potentially biased assessments, with important equity implications (Hauseman, 2015). As Martino and Rezai-Rashti (2013) stated, "What is needed, then, is more engagement with data generation from the bottom up, which includes both quantitative and rich qualitative data that

are generated at school board and local school level and disaggregated in multiple ways" (p. 607). While there is certainly usefulness in secondary data analysis of these large-scale assessments, it is important that researchers and policymakers do not solely rely on them given the limitations addressed above.

Limitations

One of the major limitations of this study, necessary in scoping review methodology, is the impact of the selection and exclusion criteria. Of particular significance, the decision to include only articles written in English may have eliminated articles that provide information on francophone communities. Additionally, the search and selection process, including hand searching Canadian educational journals, may have excluded some economics and sociology journals where studies containing empirical research on educational opportunity gaps have been published (e.g., Livingstone & Weinfeld, 2017). Further, the decision to include only studies with a quantitative component often excluded rich qualitative studies that focused on students' experiences in order to understand opportunity gaps with greater depth. This is particularly significant given that many scholars focusing on issues like race, religion, and sexual orientation may focus on qualitative approaches, given the difficulties of attaining disaggregated data in Canada or the desire to focus on the lived experience and voices of marginalized youth. For example, the extensive qualitative study conducted by James and Turner (2017) on race equity in the Greater Toronto Area was not included in this scoping review, among other examples of qualitative educational inequity (e.g., Dei, 2008; Dei & Kempf, 2013; Guo, 2011; James, 2012; Schroeter & James, 2015; Turner, 2015). The decision to include only peer-reviewed articles meant that potentially important data or reports produced by educational departments or local school districts were not examined. For example, TDSB data provide a wealth of information about educational disparities across race, ethnicity, language, and SES. Due to time and resource constraints, as well as the preliminary nature of this review, the authors did not consult with stakeholders and experts during the study selection process as recommended by Arskey and O'Malley (2005), which may have resulted in some studies not being reviewed.

Conclusion

To advance the study of educational inequities in Canada, a coordinated effort of research, including common terminology and attempts to fill gaps in research around contextual factors, is necessary. This scoping review demonstrates a dearth of published research into this topic as a whole, but specifically on racial, religious and LGBTQ+ social dimensions. Many studies lacked an intersectional approach, potentially hiding the ways in which combinations of various social identities, contextual environments, and policy factors may lead to increased systemic educational disparities. Further, this scoping review revealed a reliance on a few academic measurements and databases, largely cross-sectional in nature. Relying on single-time exam scores as the primary assessment of academic success fails to account for more meaningful measures of success, including graduation rates or functional literacy. This form of data collection makes it difficult to see a fuller picture of a student's education, and may unintentionally promote educational policies that focus on increasing a single score, rather than attend holistically to a student's education. From these findings, it is clear that there is a need for further research in tracking and understanding the contextual factors in K–12 educational opportunity gaps in Canada. Deeper opportunity gap research may result in important implications for Canadian educational, social, economic, and immigration policies. Intersectional data and equitable education policies deserve more attention. The authors call on researchers to conduct studies that will support the educational needs of all of Canada's youth.

Appendix A

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Aman (2008)	Academic achievement; Equity	Indigenous status; School mobility	4,460	BC	Longitudinal, secondary data analysis	BC Ministry of Education data 1991/2– 1998/9	High school completion
Anderson et al. (2006)	Achievement	Family/parental support; Gender; SES	43,314	Canada	Cross-sectional, secondary data analysis	School Achievement Indicators Program (SAIP) 2001	SAIP, math, content and problem solving
Anisef, Brown, Phythian, Sweet, & Walters (2010)	Early school leaving; Academic performance; Dropout	Age at arrival in Canada; Country of origin; Education factors; Family structure; Gender; Intersectional: Immigrant status & SES; Language factors	16,249	Toronto, ON	Longitudinal, secondary data analysis	Toronto District School Board (TDSB) administrative data	School drop out (not completed within 6 years)
Bakhshaei, Georgiou, & McAndrew (2016)	Disparities in school success; Educational achievement	Country of origin; Ethnicity; Gender; Immigrant status; Language factors; SES	1,571	QC	Longitudinal, secondary data analysis	QC school administrative databases	School delay; Graduation; Dropout rates
Basque & Bouchamma (2013)	Academic achievement	Urban vs. rural	2,436	NB (francophone schools only)	Longitudinal, observational	NB Department of Education administrative data	NB Department of Education mandatory exam 2009–2010, math
Bassani (2008)	Achievement disparities	Community size; Family structure; Social capital; SES	Not reported	Canada	Cross-sectional, secondary data analysis	Program for International Student Assessment (PISA) 1999	PISA 1999, mathematics

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Benito, Alegre, & Gonzàlez-Balletbò (2014)	Educational equality	Gender; Immigrant status; SES	130,229	Multi-national	Cross-sectional, secondary data analysis	PISA 2009	PISA 2009, reading test
Bouchamma & Lapointe (2008)	Academic achievement	Language factors; Psychological/cognitive factors	3,874	MB, NB, NS, ON, QC	Cross-sectional, secondary data analysis and survey	Council of Ministers of Education of Canada database	SAIP 2002 Writing Assessment III
Bouchard & St-Amant (2000)	School success	Gender; SES	1,965	QC	Mixed methods, cross-sectional, survey and focus groups	n/a	Grades
Brade, Duncan, & Sokal (2003)	Educational attainment	Identification with ethnicity; Indigenous status; Mobility	636	Canada	Cross-sectional, secondary data analysis and survey	Census 1991; Aboriginal Peoples Survey 1991	Highest level of schooling
Brownell et al. (2010)	At risk	SES	11,703	MB	Longitudinal, secondary data analysis	Manitoba Population Health Research Data Repository	High school completion within 7 years; Grade 9 grades and credits; Failure to accumulate 8 credits in first year of grade 9
Cadigan, Wei, & Clifton (2014)	Educational outcomes; Educational achievement	SES	1,736	Canada	Cross-sectional, secondary data analysis and survey	PISA 2003	PISA 2003, math
Carson, Kirby, & Hutchinson (2000)	Early reading achievement	Education factors; Family support; Psychological/ cognitive factors	72	ON city	Longitudinal, survey	n/a	Woodcock Reading Mastery Tests—Revised

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Castejón & Zancajo (2015)	Academic performance	SES	Not reported	Multi-national	Cross-sectional, secondary data analysis	PISA 2009	PISA 2009
Chen, Osberg, & Phipps (2015)	Achievement gap	Disability benefits; Disabled parent; SES	Not reported	Canada	Longitudinal and cross-sectional data, secondary data analysis	National Longitudinal Survey of Children and Youth (NLSCY), 1994–2008	CAT/2 test, math scores
Cheng, Klinger, & Zheng (2009)	Literacy	Family practices; Language factors	14,311	ON	Cross-sectional, secondary data analysis and survey	Ontario Secondary School Literacy Test (OSSLT), 2003	OSSLT, 2003
Chmielewski & Reardon (2016)	Achievement gap	Country education systems; Income gap in countries; SES	148,306	Multi-national	Cross-sectional, secondary data analysis	Progress in International Reading Literacy Study (PIRLS) 2001; PISA 2006, 2009, 2012	PIRLS 2001, grade 4 reading; PISA 2006, 2009, 2012, reading, math and science
Cobb-Clark, Sinning, & Stillman (2012)	Achievement gap	Immigrant status	288,056	Multi-national	Cross-sectional, secondary data analysis	PISA 2009	PISA 2009, reading, math, science
Corak & Lauzon (2009)	Differences in achievement	Family structure; Province; SES	Approx. 30,000	Canada only data	Cross-sectional, secondary data analysis	PISA 2000	PISA 2000, reading
Davies & Aurini (2013)	Learning inequality; Achievement gap	Family practices; Family structure; SES	1,376	ON, select boards	Longitudinal, secondary data analysis and survey	n/a	STAR Reading scores; report card
Demeris, Childs, & Jordan (2007)	Achievement	Proportion of special need students; SES	1,973 classes	ON	Cross-sectional, secondary data analysis	Education Equality and Accountability Office (EQAO) 1997/8	EQAO 1997/8, Grade 3 provincial exam

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Edgerton, Peter, & Roberts (2008)	Education inequality	Gender; Province; SES	28,000	Multi-national	Cross-sectional, secondary data analysis	PISA 2003	PISA 2003, reading, science, math
Edgerton, Peter, & Roberts (2014)	Academic achievement	Gender; Gender socialization; SES	21,948	Multi-national (PISA); Canada (YITS)	Cross-sectional, secondary data analysis	PISA 2003 and Youth in Transition Survey (YITS) 2003	PISA 2003
Friesen & Krauth (2010)	Achievement gap	Indigenous status	Not reported	BC	Longitudinal, secondary data analysis	BC Ministry of Education enrolment database, 1999/0– 2003/4	Foundational Skills Assessment tests, Grades 4 and 7
Garnett, Adamuti-Trache, & Ungerleider (2008)	Academic mobility	Ethnicity (ethno-linguistic groups); Gender; Language factors; Neighbourhood characteristics; SES	4,075	BC	Longitudinal, secondary data analysis	BC Ministry of Education dataset	Final Grade 12 grades, language arts, math, biology, chemistry, physics, geography, history
Geoffroy et al. (2010)	Achievement gap	Childcare experience; SES	1,863	QC	Longitudinal, secondary data analysis and survey	Quebec Longitudinal Study of Child Development (QLSCD), cohort 1997/8	Lollipop Test for School Readiness; Peabody Picture Vocabulary Test Revised; Number Knowledge Test; Kaufman Assessment Battery for Children
Hampden-Thompson (2013)	Educational achievement	Country policy; Family structure; SES	Approx. 115,000	Multi-national	Cross-sectional, secondary data analysis	PISA 2000; Social Policy Research Unit database	PISA 2000
Hanushek & Luque (2003)	Education quality; School equity	Family background; Family structure; SES	Not reported	Multi-national	Cross-sectional, secondary data analysis	Third International Mathematics and Science Study (TIMSS) 1995	TIMSS 1995

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Hochschild & Cropper (2010)	Educational achievement	Immigrant status	Not reported	Multi-national	Cross-sectional, secondary data analysis	PISA 2000, 2003, 2006; several national databases	PISA 2000, 2003, 2006
Jang, Dunlop, Wagner, Kim, & Gu (2013)	Reading achievement	Language factors	120,767	ON	Cross-sectional, secondary data analysis and survey	EQAO 2006	EQAO testing 2006
Jutte et al. (2010)	Educational outcomes	Biological risk factors (e.g. birth weight, gestational age, Apgar score); Social risk factors (e.g. mother's age, parent marital status); SES	4,667	Winnipeg, MB	Longitudinal, secondary data analysis	Manitoba Population Health Research Data Repository, April–December 1984 births	On time passage of required Grade 12 exam
Kingdon, Serbin, & Stack (2017)	Achievement gap	Intersectional: SES & Gender	126 families	QC	Longitudinal, secondary data analysis and survey	Concordia Longitudinal Risk Project—recruited members to the study from original sample	Bilan Qualitatif de l'Appentissage de la Lecture, 2nd ed.; Wechsler Individual Achievement Test (numerical subtest); GPA; grades
Klinger, Rogers, Anderson, Poth, & Calman (2006)	Gaps in achievement	Education factors; Home materials; Language factors; SES	160,491	ON	Cross-sectional, secondary data analysis and survey	OSSLT 2003; Educational Quality Indicator Framework (EQI) database	OSSLT 2003
Lloyd, Walsh, & Yailagh (2005)	Differences in achievement	Gender; Psychological/cognitive factors (achievement beliefs)	161	BC	Cross-sectional, secondary data analysis and survey	FSA 2001	FSA 2001, numeracy subscores; math report card grades

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Ma (2001)	Gap in achievement	Age; Family structure (includes size); Gender; Immigrant status; SES	32,583	Canada only data	Cross-sectional, secondary data analysis	TIMSS	TIMSS
Ma & Crocker (2007)	Achievement	Education factors; Family structure (including size); Family/parental support; Gender; Home environment; Immigrant status; Language factors; Part-time employment for student; Province; Psychological/cognitive factors; SES; Urban vs. rural	29,687	Canada	Cross-sectional, secondary data analysis	PISA 2000	PISA 2000, reading
Ma & Klinger (2000)	Academic achievement	Family/parental support; Indigenous status; Ethnicity; Family structure; Gender; SES	6,883	NB	Cross-sectional, secondary data analysis	New Brunswick School Climate Study (NBSCS)	Achievement test scores, math, science, reading, writing
Maggi, Hertzman, Kohen, & D'angiulli (2004)	Conditions preventing development of learning potential	Neighbourhood SES	78 schools	Vancouver, BC	Cross-sectional, secondary data analysis and survey	FSA 1999/2000	FSA 1999/2000, reading, math
Perry (2009)	Equitable systems of education	Country policy differences; SES	95,952	Multi-national	Cross-sectional, secondary data analysis	PISA 2003, math	PISA 2003, math
Philpott & Nesbit (2010)	Educational empowerment	Indigenous status (Innu)	908	Labrador, NL	Cross-sectional, mixed methods, focus groups, survey		Reading at grade level; attendance; drop out

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Pope, Wentzel, Braden, & Anderson (2006)	Differences across performance	Gender	Not reported	AB	Cross-sectional, secondary data analysis	AB Achievement Testing Program, June 1999–2002	AB Achievement Testing Program, Grades 3, 6, 9
Pope, Wentzel, & Cammaert (2002)	Gender relationship patterns with scores	Gender	Not reported	AB	Cross-sectional, secondary data analysis	AB diploma exam scores 2000	AB diploma exam scores 2000; school-awarded scores, 2000
Puchala, Vu, & Muhajarine (2010)	School readiness	Age; Ethnicity; Gender; Indigenous status; Language factors; Neighbourhood characteristics; SES; Special needs	6,144	Saskatoon, SK	Cross-sectional, secondary data analysis and survey	Census 2001	Early Development Instrument (EDI)
Quilliams & Beran (2009)	At-risk	Age; Ethnicity; Family/parental support; Gender; Psychological/cognitive factors	148	Calgary, AB	Cross-sectional, survey	n/a	Grades; teacher report
Richards, Vining, & Weimer (2010)	Achievement gap	Indigenous status (including size of Indigenous cohort in a school); Presence of Indigenous education policies; SES	366 schools	BC	Cross-sectional, secondary data analysis	FSA 2001/2002–2005/2006; Census	FSA 2001/2002–2005/2006
Riederer & Verwiebe (2015)	Educational achievement	Country policy; Immigrant status	96,778	Multi-national	Cross-sectional, secondary data analysis	PISA 2000–2012	PISA 2000–2012, reading
Rogers et al. (2006)	Achievement	Disabling condition; Family structure; Family/parental support; Gender	3,624 (language arts), 3,643 (math)	AB	Cross-sectional, secondary data analysis and survey	AB Provincial Language Arts and Mathematics Achievement Tests	AB Provincial Language Arts and Mathematics Achievement Tests; Highest Level of Achievement Test (Grade 5 reading)

Author/s	Terminology	Demographic/contextual variable	Sample size	Sample location	Research design	Data set	Academic measure
Roos et al. (2006)	Educational achievement	Neighbourhood characteristics (SES); SES	5,894	MB	Longitudinal, secondary data analysis	Manitoba Population Health Research Data Repository; Census 2001	Grade 12 provincial standard tests, absences, completion, grades, dropout rates
Schnepf (2007)	Educational disadvantage; Educational achievement	Immigrant status; Language factors; SES	157,334 (total); 41,542 (Canada)	Multi-national	Cross-sectional, secondary data analysis	TIMSS 1995, 1999; PISA 2003; PIRLS 2001	TIMSS 1995, 1999; PISA 2003; PIRLS 2001
Serbin, Stack, & Kingdon (2013)	Academic success; "Gender gap"	Intersectional: Gender & SES	127 families	QC	Longitudinal, secondary data analysis and survey	Concordia Longitudinal Research Project; Statistics Canada 2010	Test de rendement pour francophones; Wechsler Individual Achievement Test; IQ; report cards
Steeves, Carr-Stewart, & Marshall (2010)	Achievement gap; Educational attainment; Inequality of educational outcomes	Indigenous status (including whether attending provincial or First Nations-managed schools)	857,530	SK	Cross-sectional, secondary data analysis	SK Education Indicators Report 2008; Census	High school completion rate
Toohey & Derwing (2008)	Student success	Immigration status (category); Language factors; SES	1,554	Vancouver, BC	Cross-sectional, secondary data analysis	BC Ministry of Education 1997–2002	Graduation; provincial exam scores
Wei, Clifton, & Roberts (2011)	Academic achievement	Gender; Psychological/cognitive factors; SES	27,953	Canada	Cross-sectional, secondary data analysis and survey	PISA 2003	PISA 2003
White (2007)	Under-performing	Gender	113,050	ON	Cross-sectional, secondary data analysis	OSSLT 2002	OSSLT 2002

Appendix B

Demographic or contextual factor	Frequency	Authors
Indigenous status	8	Aman (2008); Brade, Duncan, & Sokal (2003); Friesen & Krauth (2010); Ma & Klinger (2000); Philpott & Nesbit (2010); Puchala, Vu, & Muhajarine (2010); Richards, Vining, & Weimer (2010); Steeves, Carr-Stewart, & Marshall (2010)
Age	3	Ma (2001); Puchala et al. (2010); Quilliams & Beran (2009)
Age at arrival in Canada	1	Anisef, Brown, Phythian, Sweet, & Walters (2010)
Biological risk factors	1	Jutte, Brownell, Roos, Schippers, Boyce, & Syme (2010)
Childcare experience	1	Geoffroy et al. (2010)
Community size	1	Bassani (2008)
Country education systems	1	Chmielewski & Reardon (2016)
Country of origin	2	Anisef et al. (2010); Bakhshaei, Georgiou, & McAndrew (2016)
Country policy	3	Hampden-Thompson (2013); Perry (2009); Riederer & Verwiebe (2015)
Disability benefits	1	Chen, Osberg, & Phipps (2015)
Disabled parent	1	Chen et al. (2015)
Disabling condition	1	Rogers et al. (2006)
Education factors	4	Anisef et al. (2010); Carson, Kirby, & Hutchinson (2000); Klinger, Rogers, Anderson, Poth, & Calman (2006); Ma & Crocker (2007)
Ethnicity	5	Bakhshaei et al. (2016); Garnett, Adamuti-Trache, & Ungerleider (2008); Ma & Klinger (2000); Puchala et al. (2010); Quilliams & Beran (2009)
Family background	1	Hanushek & Luque (2003)
Family practices	2	Cheng, Klinger, & Zheng (2009); Davies & Aurini (2013)
Family structure	10	Anisef et al. (2010); Bassani (2008); Corak & Lauzon (2009); Davies & Aurini (2013); Hampden-Thompson (2013); Hanushek & Luque (2003); Ma (2001); Ma & Crocker (2007); Ma & Klinger (2000); Rogers et al. (2006)
Family/parental support	6	Anderson et al. (2006); Carson et al. (2000); Ma & Crocker (2007); Ma & Klinger (2000); Quilliams & Beran (2009); Rogers et al. (2006)

Demographic or contextual factor	Frequency	Authors
Gender	21	Anderson et al. (2006); Anisef et al. (2010); Bakhshaei et al. (2016); Benito, Alegre, & Gonzàlez-Balletbò (2014); Bouchard & St-Amant (2000); Edgerton, Peter, & Roberts (2008, 2014); Garnett et al. (2008); Kingdon, Serbin, & Stack (2017); Lloyd, Walsh, & Yailagh (2005); Ma (2001); Ma & Crocker (2007); Ma & Klinger (2000); Pope, Wentzel, & Cammaert (2002); Pope, Wentzel, Braden, & Anderson (2006); Puchala et al. (2010); Quilliams & Beran (2009); Rogers et al. (2006); Serbin, Stack, & Kingdon (2013); Wei, Clifton, & Roberts (2011); White (2007)
Gender socialization	1	Edgerton et al. (2014)
Home environment	1	Ma & Crocker (2007)
Home materials	1	Klinger et al. (2006)
Identification with ethnicity	1	Brade et al. (2003)
Immigrant status	10	Anisef et al. (2010); Bakhshaei et al. (2016); Benito et al. (2013); Cobb-Clark, Sinning, & Stillman (2012); Hochschild & Cropper (2010); Ma (2001); Ma & Crocker (2007); Riederer & Verwiebe (2015); Schnepf (2007); Toohey & Derwing (2008)
Income gap in countries	1	Chmielewski & Reardon (2016)
Language factors	11	Anisef et al. (2010); Bakhshaei et al. (2016); Bouchamma & Lapointe (2008); Cheng et al. (2009); Garnett et al. (2008); Jang, Dunlop, Wagner, Kim, & Gu (2013); Klinger et al. (2006); Ma & Crocker (2007); Puchala et al. (2010); Schnepf (2007); Toohey & Derwing (2008)
Mobility	1	Brade et al. (2003)
Neighbourhood characteristics	2	Garnett et al. (2008); Puchala et al. (2010)
Neighbourhood SES	2	Maggi, Hertzman, Kohen, & D'angiulli (2004); Roos et al. (2006)
Part-time employment for student	1	Ma & Crocker (2007)
Presence of Indigenous education policies	1	Richards et al. (2010)
Proportion of special need students	1	Demeris, Childs, & Jordan (2007)
Province	3	Corak & Lauzon (2009); Edgerton et al. (2008); Ma & Crocker (2007)
Psychological/ cognitive factors	6	Bouchamma & Lapointe (2008); Carson et al. (2000); Lloyd et al. (2005); Ma & Crocker (2007); Quilliams & Beran (2009); Wei et al. (2011)
School mobility	1	Aman (2008)

Demographic or contextual factor	Frequency	Authors
SES	34	Anderson et al. (2006); Anisef et al. (2010); Bakhshaei, et al. (2016); Bassani (2008); Benito et al. (2014); Bouchard & St-Amant (2000); Brownell et al. (2010); Cadigan, Wei, & Clifton (2013); Castejón & Zancajo (2015); Chen et al. (2015); Chmielewski & Reardon (2016); Corak & Lauzon (2009); Davies & Aurini (2013); Demeris et al. (2007); Edgerton et al. (2008, 2014); Garnett et al. (2008); Geoffroy et al. (2010); Hampden-Thompson (2013); Hanushek & Luque (2003); Jutte et al. (2010); Kingdon et al. (2017); Klinger et al. (2006); Ma (2001); Ma & Crocker (2007); Ma & Klinger (2000); Perry (2009); Puchala et al. (2010); Richards et al. (2010); Roos et al. (2006); Schnepf (2007); Serbin et al. (2013); Toohey & Derwing (2008); Wei et al. (2011)
Social capital	1	Bassani (2008)
Social risk factors	1	Jutte et al. (2010)
Special needs	1	Puchala et al. (2010)
Urban vs. rural	2	Basque & Bouchamma (2013); Ma & Crocker (2007)

Appendix C

Operationalizing SES via Proxies

Composite or multiple proxies	Neighbourhood or zip code census proxies	Educational-oriented SES proxies
Anderson et al. (2006)	Anisef et al. (2010)	Bouchard & St-Amant (2000)
Benito et al. (2013)	Bakhshaei et al. (2016)	Ma (2001)
Brownell (2010)	Demeris et al. (2007)	Ma & Klinger (2000)
Castejon & Zancajo (2015)	Garnett et al. (2008)	
Chen et al. (2015)	Klinger et al. (2006)	
Corak & Lauzon (2008)	Maggi et al. (2004)	
Davies & Aurini (2013)	Perry (2009)	
Edgerton et al. (2008)	Puchala et al. (2010)	
Edgerton et al. (2014)	Richards et al. (2010)	
Geoffroy et al. (2010)	Toohey & Derwing (2008)	
Hampden-Thompson (2013)		
Hanushek & Luque (2003)		
Jutte et al. (2010)		
Kingdon et al. (2016)		
Ma & Crocker (2007)		
Roos et al. (2006)		
Schnepf (2006)		
Serbin et al. (2013)		
Wei et al. (2012)		

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