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# Cultural and economic integration of immigrants in Canada: “Do you play Hockey?”

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## Abstract

This paper studies whether acculturation by immigrants and other minority groups is associated with economic integration in Canada. We examine immigrants' participation in winter sports, particularly hockey, as a proxy for acculturation given that these sports are popular in Canada but are rarely watched or practiced in the origin countries of many immigrants to Canada. Using the Canadian Community Health Survey, we find that practicing winter sports has a positive effect on the earnings of immigrants and other minority groups. Specifically, practicing winter sports closes the income gap between immigrants and natives. However, the gap does not decrease for visible-minority immigrants, suggesting that acculturation might not be sufficient to combat racial biases.

**Keywords** Immigrant integration, Assimilation, Discrimination, Acculturation

**JEL Classification** J15, J71, J31

*“The game commonly known as ice hockey is hereby recognized and declared to be the national winter sport of Canada...”<sup>1</sup>*

## 1 Introduction

Immigrants' economic integration, or lack thereof, is a major topic of interest in many net-migrant-receiver countries including Canada. As summarized by Green and Green (1999), the economic integration of immigrants has been an explicit target for Canadian policymakers since the early twentieth century. Starting in 1967, Canada's immigration application process switched to the point-based system, whereby potential immigration candidates were given points for various traits that were perceived to be conducive to economic integration. However, despite efforts to tinker with the point-based

system in order to encourage immigrants that can seamlessly integrate into Canada's economic system, recent cohorts of immigrants have not fared as well economically as earlier cohorts.

Several explanations have been proposed as to why this may be the case. Grant and Sweetman (2004) document the fact that Europe stopped being a major departure point for incoming migrants to Canada, meaning more immigrants have been coming from countries with visual racial differentiation and language differences, which raises the issue of potential discrimination. Aydemir and Skuturud (2005) also document the shift in composition (country of origin and language skills) of immigrant cohorts and attribute one-third of the observed decline to it. Buzdugan and Halli (2009) reiterate the fact that despite increased schooling of recent cohorts of immigrants, their incomes are nevertheless decreasing. Reitz (2005) states that the massive gap between earnings of native<sup>2</sup> and immigrant workers in Canada is due to

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<sup>1</sup> National Sports of Canada Act. S.C. 1994, c. 16. Assented to 1994–05-12.

<sup>2</sup> The term “native”, especially in the Canadian context, is used to indicate non-immigrants: those who are born in Canada and does not necessarily imply Indigenous origins.

immigrants working at jobs below their skill level. Similar results are found at the Canadian provincial level, as Chemin and Sayour (2016) study the effects of increased weight for French language skills and bachelor degrees in Québec's point-based immigration system. They find that the immigrants' composition changed (as desired) with more educated and French-speaking immigrants whose labor market performances nonetheless did not improve much. This phenomenon is not limited to Canada. For example, Fernandez and Ortega (2008) found that, despite equalization of participation rates, the incidence of over-education and "gig" employment<sup>3</sup> for immigrants in Spain is at a higher level than that of natives. This raises the issue of discrimination given that the majority of recent immigrants are visible minorities, and that some harmful stereotypes and cultural differences probably inhibit utilization of their skills. However, Koopmans (2016) claims that the perceived negative effect of bias is gone if one controls for socio-cultural variables or "acculturation." Similarly, Furtado and Theodoropoulos (2009) state that the "social integration of immigrants is believed to be an important determinant of immigrants' labor market outcomes."

Could it be that a perceived lack of cultural<sup>4</sup> integration generates biases towards newcomers, and that these biases result in worse economic outcomes for immigrants? The question is whether being culturally integrated into Canada, or at least being viewed as such, helps immigrants to integrate economically. In pursuit of this question, our study complements the literature on social outcomes of visible-minority immigrants authored by Berry et al. (1989), Berry and Kalin (1995), Berry (2006), Bourhis et al. (2009), and Alcott and Watt (2017).

This study is based on an observation that Canadians are very fond of winter sports, particularly ice hockey, which is the national winter sport. Ice hockey plays a key role in Canadian identity and cultural life, with social conversation centering on hockey playoffs and prominent hockey players as household names. The majority of Canadian immigrants in the last 20–30 years have come from countries where winter sports in general, and ice hockey in particular, are not only unpopular but are not practiced at all.

We believe that watching hockey or other winter sports, at home or in public, may be a reasonable sign of cultural integration as it is a popular pastime for a

significant number of Canadians. Playing or practicing winter sports probably indicates even more integration than just watching, as it requires financial commitments (such as renting or buying equipment), and dedicating significant time and effort. Thus, the premise of this study is that practicing hockey or other winter sports is a *proxy* for acculturation. The task is to see whether practicing winter sports, which signals cultural integration, is associated with better labour-market outcomes. The empirical model is devised such that we can identify the generic and immigrant-specific effects of practicing winter sports, which allows us to estimate how much "acculturation" helps to compensate for the negative effects of being an immigrant.

We use the Canadian Community Health Survey (CCHS), which, in addition to general socioeconomic variables, contains information on whether respondents practiced ice hockey, snowboarding, and skiing in the last 3–12 months. Thus, the CCHS has all the needed components for an empirical test of association between cultural and economic integration. Using this data, we find that, in general, the practice of winter sports attenuates income loss due to being immigrants. However, we also find that if we use other metrics of being an "other" or "different" (speaking a language at home other than English or French, being a visible minority,<sup>5</sup> or a combination of these two), little attenuation is achieved for those who are a visible minority.

Our interpretation of the results is that the positive effects of acculturation imply that there may be some sort of bias against "others" (especially immigrants), and that this bias can prevent immigrants from achieving proper economic integration without first achieving cultural integration. However, it seems that even acculturation may not be enough to combat racial biases toward people who are visibly different. This finding contrasts Alcott and Watt (2017), who, by analyzing two Australian experimental studies, conclude that the native population views immigrants not through racial appearances, but through the acculturation lens.

The paper proceeds as follows: Sect. 2 discusses the relevant literature, Sect. 3 describes the data, Sect. 4 presents the estimation strategy, Sect. 5 discusses the estimation results, and Sect. 6 concludes the paper.

<sup>3</sup> A job that is not permanent, project-based, and lasts a specified period of time and thus often lacks many social benefits that come with stable full-time employment such as employer-sponsored pension plans, health benefits, etc.

<sup>4</sup> For the purpose of this study, the terms *cultural integration*, *cultural assimilation*, *acculturation* will be treated as synonymous.

<sup>5</sup> Visible minority refers to whether a person belongs to a visible minority group as defined by the Employment Equity Act and, if so, the visible minority group to which the person belongs. The Employment Equity Act defines visible minorities as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour". The visible minority population consists mainly of the following groups: South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean and Japanese. <https://www23.statcan.gc.ca/imdb/p3Var.pl?Function=DEC&Id=45152>.

## 2 Literature review

Cultural integration, or lack thereof, is a multifaceted and sensitive issue. To start with, determining at what level one can be considered sufficiently acculturated is very difficult to define precisely in a way that can be universally accepted. Due to personal perceptions, biases or stereotypes, the majority (native population) may refuse to acknowledge the significant level of acculturation of immigrants (Berry and Kalin 1995). When there is indeed lack of acculturation, it may stem from the fact that there may not be sufficient benefits for acculturation given the required sacrifices by the immigrants, especially in presence of racial biases. To this point, Berry (1997, 2005) is influential in his classification of four integration strategies based on the balance of desire to acquire a new culture and to retain one's original culture: assimilation (fully embracing new culture and rejecting original one), integration (acquiring new culture while maintaining original one), separation (maintaining only original culture), and marginalization (rejecting both cultures). In our work, we use the practice of winter sports as a proxy for being acculturated to Canadian society, which according to Berry (1997, 2005) is classified as either assimilation or integration. We believe that the practice of winter sports, particularly hockey, among current immigrants originating from countries where winter sports are not commonly practiced, is a reasonable sign of acquiring some aspects of Canadian culture; however, we do not know whether the original culture was abandoned or maintained. Nonetheless, we believe that determining the distinction between cultural assimilation and integration is not that crucial for our study, as Alcott and Watt (2017) state that while acculturation helps for migrants to have better social outcomes, the native population likes both integration and assimilation (i.e., the adoption of native culture).

Acculturation via sport has a long tradition of study. In fact, in some countries, sports are explicitly viewed as a way of promoting social integration of marginalized groups, as demonstrated in the case of the Netherlands by Elling et al. (2001). Moreover, sports can be viewed as such by immigrants themselves, as noted by Van der Poel and Roques (1999). Janssens and Verweel (2014) cite the White Paper on Sport of the European Union that states: "Sport promotes a shared sense of belonging and participation and may therefore also be an important tool for the integration of immigrants". In the European context there are some studies which support this notion, such as those authored by Roest et al. (2017), and Østerlund and Seippel (2014). It is interesting to note that the opposite causality has also been hypothesized. For example, Gerber et al. (2012) study the link between acculturation and physical activities in reverse in order to examine whether

acculturation leads to more physical activity and thus better health outcomes for migrants. Their study covers several dozens of studies which use various metrics of being acculturated, such as language used at home, host nation language proficiency, place of birth, and years in the host nation, in order to try to see whether acculturation is related to higher physical activity.

Similar to Gerber et al. (2012), we note that acculturation in Canada is linked to physical activity, in this case playing hockey. Given that hockey is Canada's national winter sport and is linked to its cultural identity, we use hockey as a proxy of being acculturated. We do not deny that acculturation happens via hockey. In fact, we are inclined to believe that practicing hockey or winter sports in general indeed may help with the process of acculturation. However, our study is not about strategies of acculturation or practicing sports as a means of acculturation. In this study, we primarily look at the practice of winter sports as a sign of being acculturated, and try to understand whether being acculturated helps immigrants in the Canadian labor market. From this point of view, the closest scholarship to our work is Koopmans (2016), who finds that controlling for sociocultural variables, the labor market outcome differentials between natives and immigrants becomes insignificant. The metric of acculturation used by Koopmans (2016) is a combination of language proficiency, host-country media consumption, acquaintances, friends and family members, and liberal gender values. Koopmans (2016) claim is that socio-cultural assimilation is linked to positive labor market outcomes.

The idea that social or cultural integration or assimilation is conducive to economic assimilation is common in scholarship. Furtado and Theodoropoulos (2009) find that, controlling for common assimilation factors like including language skills, intermarriage with a native is positively related to the probability of employment. While some consider marrying a native to be a strong sign of cultural integration, this association is often linked to the notion that marriage will lead to increased language proficiency; in other words, even the role of marriage in cultural integration is often viewed through the lens of acquiring or improving language skills. A more explicit way to control for the importance of cultural integration is also prevalent in the literature. Schaafsma and Sweetman (2001) state that older immigrants may find it more difficult to adjust to the culture and language of their new country. They find evidence that suggests that, for visible minorities and those whose mother tongue is not English, the age at arrival has an economic impact that may be thought of as "acculturation." Immigrants who arrive before the age of 10 receive most or all of their schooling, as well as all of their labour market experience, in

Canada. This group is the most acculturated upon entry into the labour force, and is expected to continue to acculturate comparatively easily. Thus, Schaafsma and Sweetman (2001) suggest that age is a determinant of success in acculturating. Fortin et al. (2016) investigate the effect of place of study on the native-immigrant wage gap, finding that people with degrees from Asian countries fare the worst, and that the gap increases as the age of arrival into Canada increases. The drive to control for age of arrival is explicitly motivated by the cultural assimilation consideration. Fortin et al. (2016) also note that immigrants who arrive between the ages of 15 and 29 are "...old enough to have had difficulty adapting to the host country but young enough to invest in education around the time of migration." Here, the authors imply that researching this cohort of immigrants, who are culturally different at the time of arrival but still have time to adapt, is crucial to understanding acculturation and its economic consequences. Kee (1995), who studies the effects of acculturation in a Dutch context, indicates that the return to employment status is higher for immigrants whose experience was obtained in a cultural environment similar to that of the Netherlands. Lameitre (2007) finds in the case of Sweden, the effect of immigrant origin is eliminated when Swedish reading skills are accounted for. Meng and Gregory (2005), noting a sizable literature indicating the importance of linguistic skills, study the effect of intermarriage of immigrants with natives on earnings, stating that intermarriage may affect language skills. Using Australian data, they find that intermarriage is associated with higher earnings. However, they also indicate that intermarriage can improve labour market outcomes through learning about the local labour market from a spouse.

The studies mentioned above attempt to study the economic effects of integration, assimilation and/or acculturation using proxies such as length of stay in the new country, intermarriage, and language skills. Others try to use more explicit measures of integration. For example, Pakrashi and Fritjers (2013), using an Australian dataset, built a "happiness" assimilation index based on the sensitivity of immigrants to the local news, and whether they were as happy as their compatriots or residents in the country of origin. According to this index, the more an immigrant's happiness co-moves with that of the host country, the more assimilated the immigrant is. The authors found that immigrants who speak English and arrive in Australia young tend to be the most assimilated according to the happiness index. Angelini et al. (2015) find a significant positive-association between the subjective well-being for established and second-generation immigrants and cultural assimilation, basing the degree of assimilation on the German Socio-Economic Panel

(GSOEP) dataset. GSOEP is a popular dataset due to its explicit questions about cultural and ethnic self-identification with German culture and language. Casey and Dustmann (2010) use it and find no significant association between the German identity of male immigrants and their labor market outcomes, and only a modest association for women. Constant and Zimmermann (2009) use GSOEP to construct the *ethnosizer*, a metric that combines information on language, culture, ethnic self-identification, ethnic interaction, and migration history, which is used for various studies. Schultz (1998) emphasizes the importance of cultural assimilation, arguing that the study of long-term economic assimilation would benefit from focusing on the children of immigrants born and raised in the host country. In some cases, cultural assimilation may not be required, particularly if the culture and traditions of the arriving immigrants are known to natives. For example, Hatton and Leigh (2011) use U.S. Census data to argue that immigrants assimilate as communities; the longer a given immigrant community is present in and adjusts to its host country, the more easily new arrivals from that community are accepted by the native population.

### 3 Data

#### 3.1 Canadian context for immigration in numbers

Canada is a "country of immigrants;" according to the Canadian Census 2016, of the 34,460,065 people living in Canada, 7,540,830 (22%) are immigrants. 1,212,075 (16.07%) of these immigrants arrived in Canada between 2011 and 2016, and 3,198,920 (42.42%) arrived at the age of 25–44, which is after their formative years. Immigrants arriving to Canada at this age do not go through the Canadian school system, which has the potential to act as a major catalyst for cultural integration. A significant proportion are immigrants from countries where ice hockey, and winter sports in general, are not very popular. Of Canada's 7,540,830 immigrants, 3,629,160 (48.12%) are identified as having origins in Asia (it is notable that 21,710 (0.29%) come from Korea, 4,905 (0.06%) come from Japan, and 129,020 (1.71%) come from China, where winter sports are popular, though hockey is still not widely practiced or watched), 895,895 (11.88%) come from the Americas (excluding the U.S.A.), and 162,800 (2.16%) come from Africa. It follows that two thirds of migrants come from places where winter sports, especially ice hockey, are not practiced at all or are not very popular.

Immigrants to Canada can be classified into three groups (with a varying degree of precision): economic migrants who come for economic reasons (federally or provincially chosen), family reunification migrants (spouses, parents, etc.), and refugees. Most immigrants

to Canada belong to the economic group, officially referred to as "economic classes." For this group of immigrants, various forms of point-based systems have existed since 1967. Candidates for immigration are given points for possessing various characteristics, such as proficiency in official languages, education, and experience. If candidates gather sufficient points to pass a threshold, the candidates (families) apply and their applications are processed. The composition and the relative weight of the characteristics have changed over time, but the goal of this group remains the same: to ensure immigrants arriving in Canada are *ready to integrate economically* into the society. The expectation is that characteristics such as knowledge of official languages, education and experience, and previous experience living in Canada are the factors which should help with economic integration.

Immigrants under the other two groups, family reunification and refugees, are more likely to have trouble with economic integration, as they may not necessarily have the language skills, education, experiences, and resources to aid their economic integration (e.g., to open their own business). Refugees may additionally have physical or physiological traumas which could hinder quick integration into economic life in Canada.

Of the 5,703,615 immigrants who migrated to Canada between 1980 and 2016, 2,994,130 (52.49%) are economic immigrants, 1,782,490 (31.25%) are family sponsored, and 858,845 (15.06%) are refugees and others.

### 3.2 Canadian community health survey

The CCHS is a major, annual cross-sectional survey that collects respondents' answers related to health and well-being.<sup>6</sup> The CCHS is conducted to inform health-related policies; however, the breadth of the information available in the survey makes it also potentially useful for shaping policies that address other social issues such as immigration.

The CCHS collects data on injuries experienced while practicing sports, and the injury-preventive measures undertaken. It asks respondents to identify whether they practiced various sports and whether appropriate protective-equipment was employed. Among the questions CCHS asks is whether the respondent practiced skiing, snowboarding, or played hockey in the last 3 months, and the last 12 months.

As previously noted, the CCHS is a major source of information for health and social policy as it collects a significant amount of information on the social

characteristics of the respondents and their households. The data covers information such as the individual's age, the highest educational attainment (both the respondent and in the household), income category (for the respondent and for the household) in increments of \$20,000 CAD (top-coded at \$80,000 CAD for incomes above \$80,000 CAD), and income rank in Canadian, provincial and Health Region's<sup>7</sup> income distributions. It also asks about the respondent's immigration status, ethnic background (coded as being a visible minority or not), as well as questions related to knowledge of English and French (the two official languages of Canada), and the main language spoken at home. Thanks to these variables, the relatively large sample size, and the frequency of conducted surveys, the CCHS can be used in immigrants' integration studies. We used Public Use Microfiles (PUMF) of the CCHS available via Ontario Data Documentation, Extraction Service and Infrastructure (ODESI). The main shortcoming of PUMF is that, for confidentiality reasons, many variables such as income and age are given in categories, with income being top coded, and the lowest geographic level at which place of residence can be identified is the Health Region.

For our analysis, we pooled data from 2010 to 2014 surveys.<sup>8</sup> We studied respondents (individuals) rather than households, as the sampling unit in CCHS is a person, and the practice of winter sports and immigration-related variables are not available for the entire household. We used personal-level survey weights. We kept respondents who are between 15 and 60 years old, but otherwise did not place any restrictions on the data we used in our analysis. More details on the data can be found in Table 1 (descriptive statistics), Table 2 (descriptions of the categorical variables), and Table 3 (proportions of the categories of categorical variables). From Table 1 it follows that 22% of the sample of respondents belonged to a visible minority group, 23% were immigrants, 9.8% spoke a language other than English or French at home, and 12% practiced winter sports, which is the proxy for integration described below.

### 3.3 Proxy for integration

As stated, we view the practice of winter sports, and especially hockey (due to its social nature requiring teammates, etc.) to be a reasonable proxy for cultural

<sup>6</sup> The CCHS started collecting data in 2001, and in 2015 there was a major redesign (so for data compatibility we limited our data to 2014). It is a sample survey with a stratified sample and cross-sectional design and the person is the sampling unit. Statistics Canada sends mail an access code for the survey to be submitted online. The survey is voluntary.

<sup>7</sup> "Health region" refers to administrative areas defined by the provincial ministries of health. <https://www150.statcan.gc.ca/n1/pub/82-402-x/2015001/regions/hrpg-eng.htm>.

<sup>8</sup> CCHS changes in its frequency and design. A period of unchanged format was between 2007 (when CCHS became annual) and 2014 (the last survey year before a major redesign). We concentrated on 2010–2014 as these years between two Canadian censuses (2011 and 2016) so we can cross validate some immigrant related statistics.

**Table 1** Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Age (categories)	291978	8.774669	3.497277	0	12
Male (dummy)	291978	0.4980949	0.4999972	0	1
Visible minority (dummy)	291978	0.2059154	0.4043696	0	1
Immigrant (dummy)	291978	0.2325695	0.4224708	0	1
Speak foreign language at home (dummy)	291978	0.0900309	0.2862265	0	1
Practice winter sports (dummy)	291978	0.1176937	0.3222456	0	1
Total personal income-all sources (categories)	291978	3.492722	1.415745	1	6
Education (categories)	291978	3.148223	1.157898	1	4
Family size (categories)	291978	2.718289	1.255751	1	5

Survey's personal-level weights are used in the estimation

**Table 2** Descriptions of the categorical variables

Category	Age	Total personal income-all sources	Family size	Education
1		No income	1 Person	<Sec. school gr.
2	15–17	<\$20,000	2 People	Sec. school. gr.
3	18–19	\$20,000–\$39,999	3 People	Some post-sec ed.
4	20–24	\$40,000–\$59,999	4 People	Post-sec cert.
5	25–29	\$60,000–\$69,999	5 + People	
6	30–34	\$80,000 or more		
7	35–39			
8	40–44			
9	45–49			
10	50–54			
11	55–59			
12	60–64			

**Table 3** Proportions of the categories, %

Category	Age	Total personal income-all sources	Family size	Education
1		3.6	16.9	14.3
2	2.3	25.5	35.2	17.7
3	2.7	27.0	18.1	6.8
4	10.0	19.2	18.7	61.2
5	10.7	11.3	11.0	
6	10.2	13.4		
7	10.4			
8	11.1			
9	11.2			
10	11.7			
11	10.8			
12	8.9			

integration. We do not know whether practicing winter sports is a deliberate act of acculturation, which, as we stated in the Sect. 2, is an active field of study. Practicing winter sports can be also a by-product of a broader acculturation experience (e.g., attending or interacting with a Canadian school) or a way of “signaling” being acculturated. We stay agnostic on this dimension not because we think these are not important distinctions, but due to the lack of relevant information or indicators. We just claim that the practice of winter sports, and especially hockey, is likely to be a “marker” of acculturation similar to, for instance, the consumption of specific foods or wearing various clothes specific to the local culture, and a trait that locals might view as integration in their culture. As stated above, the CCHS has two variables for indicating the practice of winter sports: (1) whether one practiced snowboarding or skiing in the last 3–12 months and (2) whether one played hockey in the last 12 months. We combine these two variables into one for the purpose of our analysis: whether one practiced snowboarding, skiing, or playing hockey in the last 3–12 months.

### 3.4 Metrics of being “different”

Our main goal in this exercise is to estimate whether immigrants benefit from engaging in winter sports (especially hockey), which is a proxy for acculturation. However, our interest goes beyond just immigrants and includes those viewed as “other,” “alien,” or “different;” namely, those who might suffer from a bias against individuals who are regarded by majority of the society as “different” for various reasons, such as their ethnicity, national origin, visual appearance, language proficiency, culture, or life style. This is due to the fact that if unfavorable labor market outcomes of immigrants are not due to some economic factors but are the result of biases or discrimination, those negative factors may persist over generations. That is, people may suffer from the bias against the “different” people. More specifically, we

notice that being born in Canada may not always mean being brought up with only Canadian culture and being perceived as a carrier of that culture. In this study, we want to see how those who may be *viewed as* "different" benefit from blending in (acculturation) and signaling their "Canadianness" by practicing winter sports. In other words, does a "signal" of cultural integration pay off with higher income?

Thus, we consider two additional metrics of being "different" found in CCHS: (1) whether the respondent speaks a language which is not English or French<sup>9</sup> at home (*lang*); (2) whether the person is a visible minority (*race*), as defined in the footnote 5. As one may expect, there is a significant overlap between the individuals in these two categories and immigrants; however, the overlap is not perfect. We believe that the language indicator is important, as one's language, especially spoken at home, can indicate a level of cultural integration or assimilation. Second generation immigrants, who are not officially classified as immigrants, may still maintain a very strong cultural identity in common with their ancestors, including speaking their ancestral language at home. This can make integration more difficult and/or result in the second generation being treated poorly in society for being perceived as an "other."

Related to this perception of being an "other," immigrant status alone may not mean much if immigrants are, for example, from European countries. These immigrants from Europe may not play hockey but, due to language and European ancestry, education, and culture, may blend in and therefore not be viewed as (very) "different." Thus, we are also interested in the degree to which practicing winter sports helps visible minorities (those who by appearance show non-European descent and may imply a recent immigration past) economically integrate into Canada. When immigrants are treated differently due to discrimination, it is not always because of the "place of birth" line on their government papers, but often due to their visibly-different appearance. Thus, we also use a dummy for being a visible minority.

We also want to consider cases where the person is viewed as "different" for more than one category, so we analyze the effect of winter sports for: (1) immigrants who do not speak English or French at home (*imm-lang*); (2) immigrants who are a visible minority (*imm-race*); (3) immigrants who do not speak English or French at home and who are a visible minority (*imm-lang-race*). In our analysis, we separate the sample into *majority* and

*minority* groups, where the minority is characterized by one of the metrics of being "different" discussed above and the majority represents the rest (individuals without recent migration background).

## 4 Methods—Empirical model

### 4.1 Model Specification

Given our view that practicing winter sports (which requires more commitment than just watching) is an indication of cultural integration, we want to see whether immigrants (or those who seem "different," whom we have designated as the minority group) who practice winter sports earn more and whether the earning gap between immigrants and natives (minority and majority) differs when immigrants practice winter sports.

Before going further, it is worth noting some nuances when we say "cultural integration." We have no data to confirm whether the minority internalizes a new Canadian identity which includes winter sports, or whether they choose to participate in Canadian cultural activities to signal to others that they are "acculturated" in order to be more accepted in Canadian society. This second notion is likely if the cultural bias is well known to the minority and they try to "blend in"<sup>10</sup> to avoid it. Irrespective of the motivation to practice winter sports, if the empirical results are significant and indicate positive return on earnings, this may imply a cultural bias.

One could argue that there are reasons other than the need to overcome cultural bias for a positive association between practicing winter sports and income. For example, minority individuals practicing winter sports may have more opportunities to network, which helps them to realize their professional potential. Even if practicing winter sports is not intended to "signal" anything and is done purely for pleasure, engaging in winter sports, and especially hockey, may help individuals to make connections, enhance team-building skills, demonstrate assertiveness, socialize, etc. If the effect of practicing winter sports is the same for the majority as the minority, then there is a general positive-association between winter sport practice and income. Thus, this type of positive association, even if it exists, would not be minority-specific, as it would also be true for those in the majority. To address this issue, we identify a *minority-specific effect* of practicing winter sports, which we aim to attribute to "acculturation." It is this quest for the minority-specific effect of practicing winter sports that motivates the specification Eq. (1), in which we estimate:

<sup>9</sup> Note that many Indigenous peoples of Canada "living on reserves and other Aboriginal settlements in the provinces" who at home are likely to speak a language other than English or French are not covered in this survey.

<sup>10</sup> A stereotypical comedy take on this from Canadian comedian Russel Peters (who is of Indian origin) is when his father buys a BBQ and organizes a BBQ party for neighbors to "become" Canadian: <https://www.youtube.com/watch?v=QaF05LuGqxs>.

$$y_{ij} = \beta_0 + \beta_1 \times \text{winter}_{ij} + \beta_2 \times \text{diff}_{ij} + \beta_3 \times \text{diff}_{ij} \times \text{winter}_{ij} + X_{ij}^T \times \theta + v_{ij} \quad (1)$$

where,  $y_{ij}$  is the category of personal income of person  $i$  in the survey year  $j$ ,  $\text{winter}_{ij}$  is a dummy for practicing winter sports, and  $\text{diff}_{ij}$  is a dummy for being “different.” The latter dummy can be one of the three categories of being different: (1) immigrants—*imm*, (2) those who do not speak English or French at home—*lang*, (3) are a visible minority—*race*. Additionally,  $\text{diff}_{ij}$  can be an indicator for a combination of metrics of being “different,” namely: (4) immigrants who speak a foreign language at home—*imm-lang*, (5) immigrants who are also a visible minority—*imm-race* and (6) immigrants who are a visible minority and speak a foreign language at home—*imm-lang-race*.  $X_{ij}$  is a vector of other covariates, which include personal characteristics such as education (*educ*), age (*age*), family size (*size*), gender (*male*), survey year and province-fixed effects. All personal characteristics except gender are used as continuous variables. Note that when not used as  $\text{diff}_{ij}$ , the visible minority status, immigrant status, and language spoken at home dummies are in  $X_{ij}$ . Given the fact that the dependent variable is an ordered categorical variable, in addition to Ordinary Least Squares (OLS) estimation (where income is treated as a continuous variable), we also use Ordered Probit regression method (where income is treated as discrete ordered categories).

## 5 Expected signs

As expected, the coefficients of interest in Eq. (1) are  $\beta_0$ ,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$ . Assuming all the other variables at their base levels (meaning a male, non-visible minority person with lowest amount of education, from a small family who uses English or French at home), the expected return to various characteristics are quantified as:

- $\beta_0$ —majority who does not practice winter sports
- $\beta_0 + \beta_2$ —minority who does not practice winter sports
- $\beta_0 + \beta_1$ —majority who practices winter sports
- $\beta_0 + \beta_1 + \beta_2 + \beta_3$ —minority who practices winter sports

Of all the coefficients of interest, we most strongly expect that being a minority is associated with lower income ( $\beta_2 < 0$ ). We are interested to see the sign and statistical significance of  $\beta_1$ . We refer to  $\beta_1$  as a “generic” effect of practicing winter sports on income, as it shows whether practicing winter sports has a general positive association with income common for both the majority and minority populations. We have no prior with respect

to the coefficient on the interaction term ( $\beta_3$ ), and yet this is the most important variable. Interaction term captures the *minority-specific* effects of winter sport practice which we attribute to “acculturation,” albeit under a strong assumption that the interaction term is exogenous (more on issues with that assumption in the next subsection). To understand why we think  $\beta_3$  is the most relevant coefficient, we consider several scenarios.

**Scenario 1.** Consider comparing a minority who practices winter sports and minority who does not practice winter sports, that is  $\beta_0 + \beta_2$  vs  $\beta_0 + \beta_1 + \beta_2 + \beta_3$ . The difference between them is  $\beta_1 + \beta_3$ . Note that unlike the Eq. (1), here the effect of practicing winter sports is “broken” into a “generic” component (a common component between the majority and the minority) and a minority-specific component. We view  $\beta_1$  as the “generic” effect of practicing winter sports, and  $\beta_3$  as the minority-specific effect of practicing winter sports, which we attribute to acculturation.  $\beta_3$  measures whether the return on practicing winter sports is bigger or smaller for the minority than for the majority. From this point of view, even with  $\beta_3 = 0$ , and assuming  $\beta_1 > 0$ , migrants who practice winter sports still earn more than those who do not practice. However, the minority still earns less than the majority who practices winter sports, as practicing winter sports does not have a compensatory effect for losing income due to being a minority, and has the same “generic” return for the majority. The situation for the minority is worse if  $\beta_3 < 0$ , and if it is very large. In this case, if  $|\beta_3| \geq |\beta_1|$ , then the return is higher for the non-practicing minority, meaning that winter sports are associated with a lower return for the minority despite  $\beta_1 > 0$  implying a positive “generic” return to winter sports.

**Scenario 2.** Another interesting scenario is to compare a minority who practices winter sports and a majority who do not practice winter sports. The question here is whether practicing winter sports compensates for being a minority, i.e., whether the practice of winter sports brings the minority up at least to the level of non-practicing majority ( $\beta_0 + \beta_1 + \beta_2 + \beta_3$  vs  $\beta_0$ ). The difference between these two cases is  $\beta_1 + \beta_2 + \beta_3$ . We expect  $\beta_2 < 0$ , but the question is whether being a minority helps or hinders winter sports’ ability to boost earnings, that is, whether  $\beta_1 + \beta_3$  outweighs  $\beta_2$ . That depends on the sign and magnitude of  $\beta_3$  needed to have  $\beta_1 + \beta_3 > \beta_2$ . Another way of looking at this is to ask whether the “acculturation” part of practicing winter sports is enough to compensate for being a minority, that is assuming  $\beta_2 < 0$ , we have  $|\beta_3| \geq |\beta_2|$ .

**Scenario 3.** It is also interesting to consider whether the gap between the majority and the minority is different when they practice winter sports; in other words, to examine whether “treating” both groups with winter

sports shrinks the gap between them. The gap between the non-practicing majority and the minority is  $\beta_2$ , and the gap between the practicing majority and the minority is  $\beta_2 + \beta_3$ . Our improvised "diff-in-diff" estimate is  $\beta_3$ , so again, the coefficient on the interaction term captures the minority-specific effects of winter sport practice.

To summarize, we break down the effects of winter sport practice into two parts: the "generic" effect  $\beta_2$ , which is common for both the majority and the minority, and the minority-specific component  $\beta_3$ . If  $\beta_3 > 0$ , we attribute it to the "acculturation" effect of practicing winter sports (unless something else can explain the minority-specific effect). Thus, the most important variable of interest for us is  $\beta_3$ . In order to understand how much "acculturation" compensates for the income loss associated with being minority, we need to compare magnitudes of  $\beta_2$  and  $\beta_3$ .

### 5.1 Endogeneity

A caveat we should note is that our model specification does not rule out the possibility of endogeneity of winter sport practice. One could argue that we may be facing an omitted variable bias, which is especially true if a willingness to practice winter sports is related to certain characteristics such as talent, enjoying team play, leadership qualities, persistence, endurance, adventurousness, risk taking, and an ability to operate under physical and psychological stress. In other words, these qualities, which exist independently of winter sports, may have positive effects on income. As stated above, we are mostly interested in the interaction term in the Eq. (1), so even just a consistent estimate for the interaction term is satisfactory for us. The problem is that the variable we suspect to be endogenous is itself a proxy for acculturation, and it is hard to imagine which variable can instrument it (omitted instrument in Two-Stage Least-Squares regression).

Endogeneity is well-known to produce biased and inconsistent OLS estimates. However, if the endogeneity between income and hockey exists, it probably exists for the majority and the minority alike. Our interest is in the *difference* between those biased estimates, which is  $\beta_3$ . More formally, Nizalova and Murtazishvili (2016) demonstrate that when endogeneity is due to an omitted variable bias, under certain conditions, the OLS estimate of the interaction term can be consistent. According to Nizalova and Murtazishvili (2016), the condition that guarantees the consistent estimate of interaction coefficient is that the unobserved variable (e.g., talents) and likelihood of practicing winter sports are jointly independent of minority status (e.g., decision to immigrate).

This is a very promising approach but, unfortunately, we cannot guarantee that this condition always holds. For example, it could be that the hurdles for engaging in

winter sports differ for minorities relative to the majority population for a variety of reasons such as income (as discussed in detail in the next subsection). As a consequence of this correlation between unobserved variables (e.g., talent), which may affect the self-selection into winter sports, the outcome variable might differ between the majority and the minority. Therefore, the omitted variable bias is an issue if the correlation between unobserved characteristics on the one hand, and the selection of winter sports on the other, is not equal for all groups in society.

We cannot maintain that our estimate of the interaction coefficient is necessarily consistent. Thus, we advise interpreting our results and estimations as descriptive and rather than causal evidence.

### 5.2 Additional caveats regarding education

We control for education in our estimation of Eq. (1). Thus, whatever results we obtain are net of the effects of education. However, this does not rule out that education can indeed on its own play a certain role in the process of acculturation, as well as in the chosen indicator of being acculturated. For example, in Canada, unlike some other countries, school or university sports teams are a common phenomenon, with many students playing winter sports including hockey. Thus, access to Canadian education can be a gateway to getting into sports, which in turn may help with acculturation and labor market integration.

As discussed in the previous subsection, income and education can be among hurdles for performing winter sports that differ for minorities relative to the majority population, which raises the possibility of endogeneity. One may also claim that practicing winter sports, which are associated with some financial costs (e.g., for sportswear and venues), is more attainable for those with certain economic backgrounds (potentially linked to more education). Practicing winter sports comes at a time-cost as well (Hamermesh and Trejo 2013). From this point of view, a higher-income (and likely more educated) minority can afford more leisure, which can be dedicated to physical activities that can lead to more acculturation. On other hand, a higher income implies a higher opportunity-cost of leisure, so it is not clear what the overall effect should be. However, despite these arguments, we know that given their education, immigrants in the last 20–30 years still earn less than the local population, hence the motivation for our study.

In general, to say more about the role of education, we would need to know more about its level and the place it was acquired. Here we have major limitations with data available for our study. The first of these limitations is the fact that we cannot tell precisely where immigrants

received their education based on data from CCHS. Second, the education categories are very broad, as is obvious from Table 2 (education categories) and Table 3 (education category frequencies), where for example we have a broad category of “post-secondary certificate,” which more than half of respondents report to have.

## 6 Results and discussion

### 6.1 OLS results

The results for the OLS estimations of Eq. (1) for base metrics of being “different” can be found in the first three columns of Table 4. The difference between three columns is what metric of being “different” is interacting with the variable indicating the practice of winter sports. In the first column, the variable is whether or not the person is an immigrant, which is the baseline specification. In the second column, the variable is speaking a foreign language at home, and in the third column the variable is being a visible minority. Please note that to be on the safe side in the light of persistent possibility of endogeneity, we suggest viewing the estimates of the minority-specific effect (the interaction term) as a descriptive rather than causal inference. In all three estimations, those with higher levels of education, those in bigger families, and males tend to earn more. The three variables of interest have expected signs for the first two estimations: immigrant status and language have a negative sign ( $\beta_2 < 0$ ), the practice of winter sports has a positive sign ( $\beta_1 > 0$ ), the interaction is positive ( $\beta_3 > 0$ ), and all are statistically significant. In the third estimation, the indicator for being a visible minority has a negative sign, the practice of winter sports has a positive sign, and yet the interaction term is negative and statistically insignificant. Looking into the signs and magnitudes of the coefficients, we can summarize the results in the following way: minority status, as expected, comes with negative effect on earnings ( $\beta_2 < 0$ ), and winter sports practice has generic positive effects both for the majority and the minority ( $\beta_1 > 0$ ). However, winter sports practice also has a minority-specific positive effect which we attribute to acculturation ( $\beta_3 > 0$ ). Together they bring the minority income much closer to the income of their majority counterparts. That said, the acculturation effect is not always sufficient to compensate (which would be if  $|\beta_3| > |\beta_2|$ ) for the loss of income associated with being a minority, especially for visible minorities. This implies that practicing winter sports attenuates (compensates for) the negative effects of being “different” under two out of three categories of being “different.” The lack (or absence) of attenuation can be traced back on non-observed factors such as differences in schooling or education systems, different values of work experience acquired abroad and in Canada, and ethnicity or race-based discrimination.

We also test the combined metrics of being “different:” namely, being an immigrant who speaks a foreign language at home, being an immigrant who is a visible minority, and being an immigrant who speaks a foreign language at home and is a visible minority. The first three columns of Table 5 report the OLS results of these specifications. The three variables of interest have expected signs and are statistically significant except the *imm-race* case, where the interaction coefficient is statistically insignificant. This implies that while the combined metrics of being “different” are also associated with lower earnings, the practice of winter sports attenuates the negative effects. Note that the negative effects of combined *imm-lang-race* effect is almost twice as large as the negative effects of *imm-lang*. Given that the interaction term is smaller for the *imm-lang-race* compared to *imm-lang*, the negative effect associated with being “different” is attenuated very little (less than half). This implies that the easily identifiable or visible indicators of being “different” are not that easy to overcome by acculturation. Therefore, attempts by the minority to blend in, when differences in their physical appearance are visible, may not help much.

### 6.2 Ordered probit results

The results (coefficients) for the Ordered Probit estimations of Eq. (1) for base metrics of being “different” are in the last three columns of Table 4. The coefficients of interest are essentially similar in sign and statistical significance to the OLS results. Unlike visible minority status, the earnings loss associated with being an immigrant or speaking a foreign language at home is attenuated by the practice of winter sports.

The Ordered Probit estimation using combined metrics of being “different” are in the last three columns of Table 5. They also have similar results to OLS estimations. The *imm-race* is statistically insignificant, meanwhile in the case of *imm-lang* and *imm-lang-race*, the practice of winter sports seems to attenuate the negative impact of being “different” on income. As in case of OLS, the attenuation is almost full for *imm-lang* case, but not for the *imm-lang-race* case.

Interestingly, being a visible minority on its own seems to reduce earnings by a quantity comparable to that of immigrant status or language. But when combined with immigrant status and language spoken at home, it produces a much larger drop in income, which is at best attenuated only by 50% by the winter sports practice.

Again, this implies that a visible physical difference is linked to lower income which is not improved by acculturation. For those who are different in all three categories, the practice of winter sports may not help much. This suggests that acculturation plays a role in integration in the labor market, but that some biases (probably

**Table 4** Estimations results (base version of diff<sub>ij</sub>)

	OLS			O-Probit		
	1	2	3	4	5	6
	imm	lang	race	imm	lang	race
<b>Winter</b>	0.291*** (0.0174)	0.313*** (0.0169)	0.334*** (0.0176)	0.232*** (0.0147)	0.249*** (0.0143)	0.265*** (0.0149)
<b>Interaction</b>	0.233*** (0.0513)	0.250*** (0.0863)	− 0.0673 (0.0516)	0.194*** (0.0434)	0.232*** (0.0710)	− 0.0395 (0.0431)
<b>Lang</b>	− 0.289*** (0.0217)	− 0.308*** (0.0221)	− 0.293*** (0.0218)	− 0.260*** (0.0193)	− 0.277*** (0.0198)	− 0.263*** (0.0193)
<b>Race</b>	− 0.294*** (0.0149)	− 0.297*** (0.0148)	− 0.292*** (0.0154)	− 0.245*** (0.0127)	− 0.248*** (0.0127)	− 0.245*** (0.0132)
<b>Imm</b>	− 0.149*** (0.0160)	− 0.127*** (0.0155)	− 0.128*** (0.0155)	− 0.120*** (0.0135)	− 0.103*** (0.0132)	− 0.103*** (0.0132)
Male	0.692*** (0.00911)	0.692*** (0.00911)	0.693*** (0.00912)	0.575*** (0.00794)	0.575*** (0.00794)	0.575*** (0.00794)
Age	0.0523*** (0.00131)	0.0522*** (0.00131)	0.0522*** (0.00131)	0.0473*** (0.00115)	0.0472*** (0.00115)	0.0472*** (0.00115)
Educ	0.407*** (0.00355)	0.407*** (0.00355)	0.407*** (0.00355)	0.347*** (0.00342)	0.346*** (0.00342)	0.346*** (0.00343)
Size	0.0355*** (0.00431)	0.0353*** (0.00431)	0.0347*** (0.00431)	0.0178*** (0.00366)	0.0177*** (0.00366)	0.0172*** (0.00366)
Constant	1.111*** (0.0320)	1.111*** (0.0320)	1.111*** (0.0320)			
Observations	291,978	291,978	291,978	291,978	291,978	291,978
R <sup>2</sup>	0.225	0.225	0.225			

OLS indicates OLS results, O-Probit indicates Ordered Probit results. Lower-level column names indicate the variable used as diff<sub>ij</sub>. Standard errors are reported in parentheses. Variables of interest are in bold. Control variables include age, education, gender, household size, race, province and year fixed effects. Survey's personal-level weights are used in the estimation. Significance at the one, five and ten percent level are indicated by three, two and one asterisks, respectively

racial) still persist and are not fully overcome by acculturation. Thus, non-easily visible and apparent factors or indicators of being "different" may be overcome by acculturation, but visible physical differences may not.

## 7 Conclusion

### 7.1 Relevance of the study

The existence of an earnings gap between immigrants and natives is a commonly observed phenomenon. Human capital theory predicts that for equally productive people, earnings should be the same. Even if at one point the earnings differ, after some time, the earnings should converge. That period of time is viewed by many as a period of passing through "acculturation." The term acculturation may mean different things for different people. For some, acculturation is acquiring language skills, for others it is learning about local labor markets or obtaining a local education. Thus, the age at which immigration occurs is relevant in the context of integration, as language and education are among the most relevant means of acculturation for youth. Acculturation also

can mean integration into the local culture by obtaining a system of values, views, traditions, etc., which make immigrants more likely to be seen as "belonging" in their new country.

Why is this last definition of acculturation important, and why now? Since the introduction of Canada's immigration application point system in 1967, the ability of immigrants to integrate into the local economy has been the main goal of policymakers. However, the composition of immigrants has changed in the last 20–30 years. As documented, current immigrant cohorts come from places where English or French are not native languages as was more common in the past. Furthermore, today's immigrants are often visible minorities coming from non-European countries. These people are different not only by their physical appearance, language skills (of English or French), and education, but also by their culture. The combination of visibly different people with different cultures may be conducive to xenophobia, and may result in discrimination resulting in a lack of access to high-paying jobs or promotions. Where the discrimination is

**Table 5** Estimations results (alternative measures of  $\text{diff}_{ij}$ )

	OLS			O-Probit		
	1	2	3	4	5	6
	<b>Imm-lang</b>	<b>Imm-race</b>	<b>Imm-lang-race</b>	<b>Imm-lang</b>	<b>Imm-race</b>	<b>Imm-lang-race</b>
<b>Winter</b>	0.316*** (0.0168)	0.331*** (0.0170)	0.360*** (0.0169)	0.252*** (0.0142)	0.264*** (0.0143)	0.287*** (0.0142)
<b>Interaction</b>	0.300*** (0.0969)	0.0868 (0.0806)	0.255** (0.124)	0.269*** (0.0798)	0.0817 (0.0671)	0.227** (0.0994)
Male	0.692*** (0.00912)	0.692*** (0.00915)	0.692*** (0.00923)	0.574*** (0.00793)	0.574*** (0.00795)	0.571*** (0.00796)
Age	0.0506*** (0.00130)	0.0542*** (0.00130)	0.0547*** (0.00131)	0.0459*** (0.00114)	0.0488*** (0.00114)	0.0490*** (0.00114)
Educ	0.405*** (0.00353)	0.408*** (0.00357)	0.404*** (0.00357)	0.344*** (0.00340)	0.346*** (0.00343)	0.342*** (0.00341)
Size	0.0337*** (0.00431)	0.0329*** (0.00434)	0.0231*** (0.00436)	0.0163*** (0.00366)	0.0154*** (0.00367)	0.00726** (0.00367)
Race	-0.353*** (0.0139)	-	-	-0.294*** (0.0119)	-	-
<b>Imm-lang</b>	-0.378*** (0.0213)	-	-	-0.331*** (0.0192)	-	-
Lang	-	-0.349*** (0.0214)	-	-	-0.313*** (0.0190)	-
<b>Imm-race</b>	-	-0.340*** (0.0187)	-	-	-0.274*** (0.0160)	-
<b>Imm-lang-race</b>	-	-	-0.611*** (0.0223)	-	-	-0.521*** (0.0207)
Constant	1.139*** (0.0319)	1.070*** (0.0320)	1.099*** (0.0321)	-	-	-
Observations	291,978	291,978	291,978	291,978	291,978	291,978
R <sup>2</sup>	0.224	0.221	0.215	-	-	-

OLS indicates OLS results, O-Probit indicates Ordered Probit results. Lower-level column names indicate the variable used as  $\text{diff}_{ij}$ . Standard errors are reported in parentheses. Variables of interest are in bold. Control variables include age, education, gender, household size, race, province and year fixed effects. Survey's personal-level weights are used in the estimation. Significance at the one, five and ten percent level are indicated by three, two and one asterisks, respectively

not deeply rooted in ethnic or racial bias (when no matter what, someone who looks or is different is not treated equally), but rather is at the cultural level, acculturation may be linked to better earnings outcomes. Finding a good proxy for cultural integration is difficult. Proxies that could be considered include things like intermarriage, language spoken at home, and attitudes towards certain social issues. However, assessing these factors is not always easy due to difficulty in finding the appropriate data. Nevertheless, we believe the practice of winter sports, and especially hockey, may be a reasonable marker of cultural integration in Canada. We do not insist that a "truly" Canadian person must like or practice winter sports. We just observe that winter sports play a significant cultural role in the lives of many Canadians. Winter sports, and especially hockey, are not popular and

are not widely practiced in Latin America, Asia, Africa, and Eastern Europe, with the exception of some former Soviet states. These are parts of the world from where most immigrants to Canada have come from in recent decades. By comparison, if we were to conduct a similar study in Italy and tried to use soccer as a proxy for cultural integration, we believe it would not be successful, as soccer is a much more an internationally-popular game. This is not to say that similar studies could be done in other countries. Practicing winter sports, for example, could also be used as a proxy for acculturation in some parts of the U.S.A. and Northern European states, controlling for immigrant origin from countries where winter sports are not widely practiced. Involvement in American football may also be a good proxy for acculturation for the USA-based studies.

## 7.2 Impact of acculturation and racial bias

In this study we estimate the earnings based on CCHS data, using a dummy for being "different" (being an immigrant, speaking a foreign language at home, being a visible minority, and a combination of these features) as well as a dummy for practicing hockey or other winter sports. "Different" people in Canada tend to earn less; however, practicing winter sports increases their earnings (except for visible minorities), often undoing the loss that comes from being "different." We do not know whether first or second generation immigrants practice winter sports because they enjoy them, or whether they do it purposefully to signal their Canadianness. Regardless, it seems that practicing winter sports is associated with higher incomes for those deemed "different." Of course, it is possible that playing hockey may be somewhat related to a willingness to engage with locals and play with them. It may also be that those "different" Canadians who practice sports are more easygoing, personable, and active, and are thus more likely to get good job opportunities or get promoted. Qualities that are likely linked to the "generic" positive returns of practicing winter sports also enjoyed by the rest of population, but we still find specific positive effects for "different" Canadians. Thus, we cannot reject the possibility that these results may imply (racial) discrimination, especially given the negative effects of being visibly different are not fully attenuated (or not attenuated at all) by the practice of winter sports.

Certain caveats exist in the data that ideally should be addressed if better and more precise data is available. Specifically, we indicated that immigrants come to Canada via several streams, and from the point of view of readiness for economic (and even cultural) integration, they are different. If economic migrants are tested to have skills (including language and work experience) for better integration into the labor markets, the family reunification migrants and refugees often come "unprepared" for Canadian realities. An indicator under which category a person migrated would therefore be useful in future studies to distinguish immigrants. However, it could be the case that neither category would properly capture "integrability" into the labor market; despite the predominance of immigrants arriving into Canada via point-based system, migrants in last 20–30 years have struggled to economically catch up to native population, which may indicate that some other factors such as negative bias and discrimination are at play. If the above-mentioned data issues are possible to overcome, ideally by finding other sources of data or designing surveys, we believe that further analysis would be useful and necessary to see whether there is further corroborating evidence free of caveats that we discussed.

## 7.3 Policy implications

The fact that racial biases may be preventing economic integration through acculturation has potentially major implications for policies pertaining to immigrant integration, including the design of the point-based system. If a lack of economic integration even after being acculturated in Canada is indeed the result of racial biases, the economic effects could be felt even after several generations. This means that the lack of economic integration is not just immigrants' problem, but a problem faced by those who are visibly distinct from the majority. To this point, Bertrand and Sendhil's (2004) U.S.A.-based study, in which resumes with African-American sounding names got fewer call-backs than CVs with white-sounding names, revealed a job-opportunity bias that was affected by the applicants' perceived racial background rather than their presumed immigration-status. Our research suggests that effective policies for integrating newly-arrived immigrants must address the problem of racial biases, which can haunt families for generations. Anti-discrimination policies should supplement other policy initiatives (such as citizenship classes, language courses, job training programs, etc.) that aim to acculturate and economically integrate immigrants. Thus, it may mean that the struggle to help immigrants to integrate into Canadian society is also a struggle against racial prejudice.

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### Author contributions

IJ analyzed literature, obtained the data, performed econometric analysis, and was a major contributor in writing the manuscript. UK analyzed literature, performed econometric analysis, and was a major contributor in writing the manuscript. All authors have read and approved the final manuscript.

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### Availability of data and materials

The Canadian Community Health Survey data that support the findings of this study are available from ODESI [<http://odesi2.scholarsportal.info/webview/>] or Statistics Canada [<https://www150.statcan.gc.ca/n1/en/catalogue/82M0013X>] through license/subsription. The Canadian Census 2016 data are available from Statistics Canada [<https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>] The views expressed in this paper are those of the authors, and not necessarily those of Statistics Canada.

### Declarations

#### Competing interests

The authors declare that they have no competing interests.

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